# *CA INTERMEDIATE*

# *COST*
# *&*
# *MANAGEMENT ACCOUNTING*

## *Volume 2*


*By*
*CA Namit Arora Sir*


*This book is dedicated to my LIFE*

*CS. RUCHI MAM*

# *PREFACE TO THIS EDITION*

*This is a comprehensive book having thoroughly explained concepts with lucid and systematic presentation of the subject matter. All attempts are made in this book to keep concept easier to understand and remember with 100% coverage of institute materials.*

*A special attention is given to presentation keeping in mind the examination needs to the student. The book is primarily written exclusively for CA - Inter.*

*For any suggestion please mail me at **canamitarora@gmail.com***

# *A word to the students*

*My dear student, hard work is the key to success. Though smart work is publicized in today's world but to be smart, you have to work hard. So always be attentive in class and have thorough revision after the class. It is also important to be motivated and inspired for working hard. The key for success is:*

***"Work hard in class, be attentive, grab the concepts***

***&***

***Work smart during revision, select important questions for next revision."***

*ALL THE BEST*

***CA. NAMIT ARORA***

# INDEX

# *CHAPTER - 9*

# *PROCESS & OPERATION COSTING*

## *LEARNING OBJECTIVES*

***When you have finished studying this chapter, you should be able to***

- ***Understand the meaning normal/standard cost per unit.***
- ***Understand the treatment of abnormal loss, normal loss and abnormal gain in process costing.***
- ***Understand the meaning and treatment of opening and closing work in progress in process costing.***
- ***Prepare process account, abnormal gain account, abnormal loss account and normal loss account.***
- ***Understand the various methods of valuation of work in progress in process costing.***
- ***Under the concept of equivalent production.***
- ***Understand the treatment inter process profit.***

# NORMAL PROCESS ACCOUNT

## BQ 1

A product passes through three processes A, B, and C. The normal wastage and actual output of each process is as follows:

| Process | Actual Output | Normal Loss |
|---|---|---|
| Process A | 9,500 units | 3% |
| Process B | 9,100 units | 5% |
| Process C | 8,100 units | 8% |

Wastage of Process A was sold 25 Paise per unit, that of Process B at 50 Paise per unit and that of Process C at ₹1 per unit. 10,000 units were issued to Process A in the beginning of October 2023 at a cost of ₹1 per unit the other expenses were as follows:

| Name of Expenses | Process A (₹) | Process B (₹) | Process C (₹) |
|---|---|---|---|
| Sundry Materials | 1,000 | 1,500 | 500 |
| Labour | 5,000 | 8,000 | 6,500 |
| Direct expenses | 1,050 | 1,188 | 2,009 |

Selling and distribution expenses are ₹850 and sale value per unit is ₹6.00. ***Prepare all accounts.***

## Answer

### Process A Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Units Introduced | 10,000 | 10,000 | By Normal Loss A/c (3% @ ₹0.25/unit) | 300 | 75 |
| To Sundry Materials | | 1,000 | By Process B A/c @ ₹1.75 per unit | 9,500 | 16,625 |
| To Labour | | 5,000 | By Abnormal Loss A/c @ ₹1.75 per unit | 200 | 350 |
| To Direct expenses | | 1,050 | | | |
| | **10,000** | **17,050** | | **10,000** | **17,050** |

$$\textbf{NCPU} = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{17{,}050 - 75}{10{,}000 - 300} = \textbf{₹1.75 per unit}$$

### Process B Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process A A/c | 9,500 | 16,625 | By Normal Loss A/c (5% @ ₹0.50/unit) | 475 | 238 |
| To Sundry Materials | | 1,500 | By Process C A/c @ ₹3 per unit | 9,100 | 27,300 |
| To Labour | | 8,000 | | | |
| To Direct expenses | | 1,188 | | | |
| To Abnormal Gain A/c @ ₹3 per unit | 75 | 225 | | | |
| | **9,575** | **27,538** | | **9,575** | **27,538** |

$$\textbf{NCPU} = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{27{,}313 - 238}{9{,}500 - 475} = \textbf{₹3 per unit}$$

### Process C Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process B A/c | 9,100 | 27,300 | By Normal Loss A/c (8% @ ₹1.00/unit) | 728 | 728 |
| To Sundry Materials | | 500 | By Profit & Loss A/c @ ₹4.25 per unit | 8,100 | 34,425 |
| To Labour | | 6,500 | By Abnormal Loss A/c @ ₹4.25 per unit | 272 | 1,156 |
| To Direct expenses | | 2,009 | | | |
| | **9,100** | **36,309** | | **9,100** | **36,309** |

$$\textbf{NCPU} = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{36{,}309 - 728}{9{,}100 - 728} = \textbf{₹4.25 per unit}$$

**Normal Loss Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process A A/c | 300 | 75 | By Cash A/c: | | |
| To Process B A/c | 475 | 238 | Process A | 300 | 75 |
| To Process C A/c | 728 | 728 | Process B | 400 | 200 |
| | | | Process C | 728 | 728 |
| | | | By Abnormal Gain A/c | 75 | 38 |
| | **1,503** | **1,041** | | **1,503** | **1,041** |

**Abnormal Loss Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process A A/c | 200 | 350 | By Cash A/c: | | |
| To Process C A/c | 272 | 1,156 | Process A | 200 | 50 |
| | | | Process C | 272 | 272 |
| | | | By Costing P/L A/c | | 1,184 |
| | **472** | **1,506** | | **472** | **1,506** |

**Abnormal Gain Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Normal Loss A/c | 75 | 38 | By Process B A/c | 75 | 225 |
| To Costing P/L A/c | | 187 | | | |
| | **75** | **225** | | **75** | **225** |

**Costing Profit and Loss Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process C A/c | 8,100 | 34,425 | By Sales A/c | 8,100 | 48,600 |
| To Selling Expenses | | 850 | (8,100 × 6.00) | | |
| To Abnormal Loss A/c | | 1,184 | By Abnormal Gain A/c | | 187 |
| To Profit (b.f.) | | 12,328 | | | |
| | **8,100** | **48,787** | | **8,100** | **48,787** |

## BQ 2

The finished product of a manufacturing company passes through three processes, viz., I, II and III. The normal wastage in each process is 5%, 7% and 10% for the processes. I, II and III respectively (calculated with reference to the number of units fed into each process). The scrap generated out of wastage has a sale value of 70 paise per unit, 80 paise per unit and ₹1 per unit in the processes I, II and III respectively.

The output of each process is transferred to the next process and the finished output emerges from the Process III and transferred to stock. There was no stock of work-in-progress in any process in a particular month. The details of cost data for the month are given below:

| Details | Process I | Process II | Process III |
|---|---|---|---|
| Materials used (₹) | 1,20,000 | 40,000 | 40,000 |
| Direct Labour Cost (₹) | 80,000 | 60,000 | 60,000 |
| Production Expenses (₹) | 40,000 | 40,000 | 28,000 |
| Actual Output in Units | 38,000 | 34,600 | 32,000 |

***Process was fed with 40,000 units of raw input at cost of ₹3,20,000. Prepare the Process Accounts.***

## Answer

**Process I Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Units Introduced | 40,000 | 3,20,000 | By Normal Loss | 2,000 | 1,400 |
| To Materials Used | | 1,20,000 | | | |

| | | | | | |
|---|---|---|---|---|---|
| To Direct Labour<br>To Production Expenses | | 80,000<br>40,000 | (5% @ ₹0.70 per unit)<br>By Process II Account<br>@ ₹14.70 per unit | 38,000 | 5,58,600 |
| | ***40,000*** | ***5,60,000*** | | ***40,000*** | ***5,60,000*** |

***Process II Account***

| ***Particulars*** | ***Units*** | ***₹*** | ***Particulars*** | ***Units*** | ***₹*** |
|---|---|---|---|---|---|
| To Process I Account | 38,000 | 5,58,600 | By Normal Loss | 2,660 | 2,128 |
| To Materials Used | | 40,000 | (7% @ ₹0.80 per unit) | | |
| To Direct Labour | | 60,000 | By Abnormal Loss | 740 | 14,584 |
| To Production Expenses | | 40,000 | By Process III Account | 34,600 | 6,81,888 |
| | | | @ ₹19.70775 per unit | | |
| | ***38,000*** | ***6,98,600*** | | ***38,000*** | ***6,98,600*** |

***Process III Account***

| ***Particulars*** | ***Units*** | ***₹*** | ***Particulars*** | ***Units*** | ***₹*** |
|---|---|---|---|---|---|
| To Process II Account | 34,600 | 6,81,888 | By Normal Loss | 3,460 | 3,460 |
| To Materials Used | | 40,000 | (10% @ ₹1 per unit) | | |
| To Direct Labour | | 60,000 | By Finished Goods A/c | 32,000 | 8,28,699 |
| To Production Expenses | | 28,000 | @ ₹25.89685 per unit | | |
| To Abnormal Gain A/c | 860 | 22,271 | | | |
| | ***35,460*** | ***8,32,159*** | | ***35,460*** | ***8,32,159*** |

***Working Notes:***

***1. Amount of Abnormal Loss in Process II:***

$$\frac{\text{Total Cost} - \text{Sale of Scrap of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} \times \text{Abnormal Loss Units} = \frac{6{,}98{,}600 - 2{,}128}{18{,}000 - 2{,}600} \times 740$$

$$= \mathbf{14{,}584}$$

***2. Amount of Abnormal Gain in Process III:***

$$\frac{\text{Total Cost} - \text{Sale of Scrap of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} \times \text{Abnormal Gain Units} = \frac{6{,}98{,}600 - 2{,}128}{18{,}000 - 2{,}600} \times 860$$

$$= \mathbf{22{,}272}$$

## BQ 3

A product passes through three processes. The output of each process is treated as the raw material of the next process to which it is transferred and output of the third process is transferred to finished stock.

| ***Name of Expenses*** | ***Process I (₹)*** | ***Process II (₹)*** | ***Process III (₹)*** |
|---|---|---|---|
| Materials issued | 40,000 | 20,000 | 10,000 |
| Labour | 6,000 | 4,000 | 1,000 |
| Manufacturing overheads | 10,000 | 10,000 | 15,000 |

10,000 units have been issued to the Process-I and after processing, the output of each process is as under:

| ***Process*** | ***Actual Output*** | ***Normal Loss*** |
|---|---|---|
| Process I | 9,750 units | 2% |
| Process II | 9,400 units | 5% |
| Process III | 8,000 units | 10% |

No stock of materials or of work-in-process was left at the end. Calculate the cost of the finished articles.

## Answer

***Process I Account***

| ***Particulars*** | ***Units*** | ***₹*** | ***Particulars*** | ***Units*** | ***₹*** |
|---|---|---|---|---|---|
| To Materials | 10,000 | 40,000 | By Normal Loss | 200 | - |
| To Labour | | 6,000 | (2% of 10,000 units) | | |

| | | | | | |
|---|---|---|---|---|---|
| To Manufacturing OH | | 10,000 | By Abnormal Loss A/c<br>By Process II Account<br>@ ₹5.7142 per unit | 50<br>9,750 | 286<br>55,714 |
| | ***10,000*** | ***56,000*** | | ***10,000*** | ***56,000*** |

Cost per unit of completed units and abnormal loss:

$$= \frac{\text{Total Cost}}{\text{Inputs} - \text{Normal Loss}} = \frac{56{,}000}{10{,}000 - 200} = \text{₹}5.7142$$

***Process II Account***

| ***Particulars*** | ***Units*** | ***₹*** | ***Particulars*** | ***Units*** | ***₹*** |
|---|---|---|---|---|---|
| To Process I A/c<br>To Materials<br>To Labour<br>To Manufacturing OH<br>To Abnormal Gain | 9,750<br><br><br><br>138 | 55,714<br>20,000<br>4,000<br>10,000<br>1,337 | By Normal Loss<br>(5% of 9,750 units)<br>By Process III Account<br>@ ₹9.6862 per unit | 488<br><br>9,400 | -<br><br>91,051 |
| | ***9,888*** | ***91,051*** | | ***9,888*** | ***91,051*** |

Cost per unit of completed units and abnormal gain:

$$= \frac{\text{Total Cost}}{\text{Inputs} - \text{Normal Loss}} = \frac{89{,}714}{9{,}750 - 488} = \text{₹}9.6862$$

***Process III Account***

| ***Particulars*** | ***Units*** | ***₹*** | ***Particulars*** | ***Units*** | ***₹*** |
|---|---|---|---|---|---|
| To Process II A/c<br>To Materials<br>To Labour<br>To Manufacturing OH | 9,400 | 91,051<br>10,000<br>1,000<br>15,000 | By Normal Loss<br>(10% of 9,400 units)<br>By Abnormal Loss A/c<br>By Finished Goods A/c<br>@ ₹13.8658 per unit | 940<br><br>460<br>8,000 | -<br><br>6,364<br>1,10,687 |
| | ***9,400*** | ***1,17,051*** | | ***9,400*** | ***1,17,051*** |

Cost per unit of completed units and abnormal loss:

$$= \frac{\text{Total Cost}}{\text{Inputs} - \text{Normal Loss}} = \frac{1{,}17{,}051}{9{,}400 - 940} = \text{₹}13.8358$$

### *BQ 4*

From the following data, prepare process accounts indicating the cost of each process and the total cost. The total units that pass through each process were 240 for the period.

| ***Name of Expenses*** | ***Process I*** | ***Process II*** | ***Process C III*** |
|---|---|---|---|
| Materials (₹) | 1,50,000 | 50,000 | 20,000 |
| Labour (₹) | 80,000 | 2,00,000 | 60,000 |
| Other Expenses (₹) | 26,000 | 72,000 | 25,000 |

Indirect expenses amounting to ₹85,000 may be apportioned on the basis of wages. There was no opening or closing stock.

### *Answer*

***Process I Account***

| ***Particulars*** | ***Per Unit*** | ***Total*** | ***Particulars*** | ***Per Unit*** | ***Total*** |
|---|---|---|---|---|---|
| To Materials<br>To Labour<br>To Other Expenses<br>To Indirect Expenses | 625<br>333.33<br>108.33<br>83.34 | 1,50,000<br>80,000<br>26,000<br>20,000 | By Process II Account<br>(transfer to Process-II) | 1,150 | 2,76,000 |
| | ***1,150*** | ***2,76,000*** | | ***1,150*** | ***2,76,000*** |

**Process II Account**

| Particulars | Per Unit | Total | Particulars | Per Unit | Total |
|---|---|---|---|---|---|
| To Process I Account | 1,150 | 2,76,000 | By Process III Account | 2,700 | 6,48,000 |
| To Materials | 208.33 | 50,000 | (transfer to Process-III) | | |
| To Labour | 833.33 | 2,00,000 | | | |
| To Other Expenses | 300 | 72,000 | | | |
| To Indirect Expenses | 208.34 | 50,000 | | | |
| | **2,700** | **6,48,000** | | **2,700** | **6,48,000** |

**Process III Account**

| Particulars | Per Unit | Total | Particulars | Per Unit | Total |
|---|---|---|---|---|---|
| To Process II Account | 2,700 | 6,48,000 | By Finished Stock A/c | 3,200 | 7,68,000 |
| To Materials | 83.33 | 20,000 | (transferred) | | |
| To Labour | 250 | 60,000 | | | |
| To Other Expenses | 104.17 | 25,000 | | | |
| To Indirect Expenses | 62.50 | 15,000 | | | |
| | **3,200** | **7,68,000** | | **3,200** | **7,68,000** |

***Working Notes:***

***Calculation of apportionment of Indirect Expenses:***

***Process I*** $= \dfrac{\text{Indirect Expenes}}{\text{Total Labour Cost}} \times$ Labour cost of Process I $= \dfrac{85,000}{3,40,000} \times 80,000 =$ ***20,000***

***Process I*** $= \dfrac{\text{Indirect Expenes}}{\text{Total Labour Cost}} \times$ Labour cost of Process II $= \dfrac{85,000}{3,40,000} \times 2,00,000 =$ ***50,000***

***Process I*** $= \dfrac{\text{Indirect Expenes}}{\text{Total Labour Cost}} \times$ Labour cost of Process III$= \dfrac{85,000}{3,40,000} \times 60,000 =$ ***15,000***

## BQ 5

A product passes through three processes A, B and C. 10,000 units at a cost of ₹1.10 per unit were issued to process A. The other direct expenses were as follows:

| Details | Process A (₹) | Process B (₹) | Process C (₹) |
|---|---|---|---|
| Sundry Materials | 1,500 | 1,500 | 1,500 |
| Direct Labour | 4,500 | 8,000 | 6,500 |
| Direct Expenses | 1,000 | 1,000 | 1,503 |

The scrap of process A was 5% and in process B 4% on input. The scrap of process A as sold at ₹0.25 per units and that of process B at ₹0.50 per unit and that of process C at ₹1.00 per unit.

The overhead charges were 160% of direct labour. The final product was sold at ₹10 per unit fetching a profit of 20% on sales.

***Prepare all the three process accounts and find out the number of units of scrap in process C.***

***[Output: Process A ₹25,075; Process B ₹48,185; Process C ₹67,392; Units scraped in Process C 696]***

## BQ 6

RST Limited processes Product Z through two distinct processes – Process-I and Process-II. On completion, it is transferred to finished stock. From the following information for the year 2022-23, prepare Process-I A/c, Process-II A/c, Finished Stock A/c and Income Statement:

| Particulars | Process-I | Process-II |
|---|---|---|
| Raw materials used | 7,500 units | - |
| Raw materials cost per unit | ₹60 | - |
| Transfer to next process/finished stock | 7,050 units | 6,525 units |
| Normal loss (on inputs) | 5% | 10% |
| Direct wages | ₹1,35,750 | ₹1,29,250 |
| Direct expenses | 60% of Direct wages | 65% of Direct wages |
| Manufacturing overheads | 20% of Direct wages | 15% of Direct wages |
| Realisable value of scrap per unit | ₹12.50 | ₹37.50 |

6,000 units of finished goods were sold at a profit of 15% on cost. Assume that there was no opening or closing stock of work-in-process.

## Answer

### Process-I Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Raw Materials used | 7,500 | 4,50,000 | By Normal Loss | 375 | 4,688 |
| To Direct Wages | | 1,35,750 | (5% of 7,500 units) ×12.5 | | |
| To Direct Expenses | | 81,450 | By Process-II Account | 7,050 | 6,82,402 |
| To Manufacturing OH | | 27,150 | (₹96.7947 × 7,050 units) | | |
| | | | By Abnormal Loss A/c | 75 | 7,260 |
| | | | (₹96.7947 × 75 units) | | |
| | **7,500** | **6,94,350** | | **7,500** | **6,94,350** |

$$\textbf{NCPU} = \frac{\text{Total Cost} - \text{Realisable Value of Normal Loss Units}}{\text{Inputs Units} - \text{Normal Loss Units}} = \frac{6,94,350 - 4,688}{7,500 - 375} = \textbf{₹96.7947}$$

### Process-II Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process-I A/c | 7,050 | 6,82,402 | By Normal Loss | 705 | 26,438 |
| To Direct Wages | | 1,29,250 | (10% of 7,050 units)×37.5 | | |
| To Direct Expenses | | 84,013 | By Finished Stock A/c | 6,525 | 9,13,823 |
| To Manufacturing OH | | 19,387 | (₹140.0495 × 6,525 units) | | |
| To Abnormal Gain A/c | 180 | 25,209 | | | |
| (₹140.0495 × 180 units) | | | | | |
| | **7,230** | **9,40,261** | | **7,230** | **9,40,261** |

$$\textbf{NCPU} = \frac{\text{Total Cost} - \text{Realisable Value of Normal Loss Units}}{\text{Inputs Units} - \text{Normal Loss Units}} = \frac{9,15,052 - 26,438}{7,050 - 705} = \textbf{₹140.0495}$$

### Finished Goods Stock Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process-II A/c | 6,525 | 9,13,823 | By Cost of Sales | 6,000 | 8,40,297 |
| | | | (₹140.0495 × 6,000 units) | | |
| | | | By Balance c/d | 525 | 73,526 |
| | **6,525** | **9,13,823** | | **6,525** | **9,13,823** |

### Income Statement

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Cost of Sales | 8,40,297 | By Sales | 9,66,342 |
| (₹140.0495 × 6,000 units) | | (₹8,40,297 × 115%) | |
| To Abnormal Loss | 6,322 | By Abnormal Gain | 18,459 |
| [(₹96.7947 – ₹12.50) × 75 units] | | [(₹140.0495 – ₹37.50) × 180 units] | |
| To Net Profit | 1,38,182 | | |
| | **9,84,801** | | **9,84,801** |

## PROCESS ACCOUNT WITH ROYALTY

### BQ 7

The input to a purifying process was 16,000 kgs of basic material purchased @ ₹1.20 per kg Process wages amounted to ₹720 and overhead was applied @ 240% of the labour cost. Indirect materials of negligible weight were introduced into the process at a cost of ₹336. The actual output from the process weighted 15,000 kgs. The normal yield of the process is 92%. Any difference in weight between the input of basic material and output of purified material (Product) is sold @ ₹0.50 per kg.

The process is operated under a license which provides for the payment of royalty @ ₹0.15 per kg of the purified material produced.

***Prepare:***

***(a)*** Purifying Process Account

***(b)*** Normal Wastage Account

***(c)*** Abnormal Wastage/Yield Account

***(d)*** Royalty Payable Account

## *Answer*

### *(a) Purifying Process Account*

| Particulars | Kgs. | ₹ | Particulars | Kgs. | ₹ |
|---|---|---|---|---|---|
| To Basic Materials | 16,000 | 19,200 | By Normal Wastage A/c (8% of 16,000 kgs) × 0.50 | 1,280 | 640 |
| To Process Wages | | 720 | | | |
| To Overhead (240%×₹720) | | 1,728 | By Purified Material @ ₹1.60 per kg | 15,000 | 24,000 |
| To Indirect Materials | | 336 | | | |
| To Royalty Payable A/c (0.15×14,720) | | 2,208 | | | |
| To Abnormal Yield A/c @ ₹1.60 per kg | 280 | 448 | | | |
| | ***16,280*** | ***24,640*** | | ***16,280*** | ***24,640*** |

$$NCPU = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{24{,}192 - 640}{16{,}000 - 1{,}280} = ₹1.60 \text{ per kg}$$

### *(b) Normal Wastage Account*

| Particulars | Kgs. | ₹ | Particulars | Kgs. | ₹ |
|---|---|---|---|---|---|
| To Purifying Process A/c | 1,280 | 640 | By Cash A/c @ ₹0.50 per kg | 1,000 | 500 |
| | | | By Abnormal Gain A/c | 280 | 140 |
| | ***1,280*** | ***640*** | | ***1,280*** | ***640*** |

### *(c) Abnormal Yield Account*

| Particulars | Kgs. | ₹ | Particulars | Kgs. | ₹ |
|---|---|---|---|---|---|
| To Normal Wastage A/c | 280 | 140 | By Purifying Process A/c | 280 | 448 |
| To Royalty Payable A/c (280 × 0.15) | | 42 | | | |
| To Costing P/L A/c | | 266 | | | |
| | ***280*** | ***448*** | | ***280*** | ***448*** |

### *(d) Royalty Payable Account*

| Particulars | Kgs. | ₹ | Particulars | Kgs. | ₹ |
|---|---|---|---|---|---|
| To Bank A/c | 15,000 | 2,250 | By Purifying Process A/c | 14,720 | 2,208 |
| | | | By Abnormal yield A/c | 280 | 42 |
| | ***15,000*** | ***2,250*** | | ***15,000*** | ***2,250*** |

## *PROCESS ACCOUNT WITH BY PRODUCT*

### *BQ 8*

M Ltd. produces a product X, which passes through three processes, I, II and III. In Process III a by-product arises, which after further processing at a cost of ₹85 per unit, product Z is produced. The information related for the month of August is as follows:

| Details | Process I | Process II | Process III |
|---|---|---|---|
| Normal loss | 5% | 10% | 5% |
| Materials introduced (7,000 units) | 1,40,000 | - | - |
| Other materials added | 62,000 | 1,36,000 | 84,200 |

| | | | |
|---|---|---|---|
| Direct wages | 42,000 | 54,000 | 48,000 |
| Direct Expenses | 14,000 | 16,000 | 14,000 |

Production overhead for the month is ₹2,88,000, which is absorbed as a percentage of direct wages. The scrapes are sold at ₹10 per unit. Product Z can be sold at ₹135 per unit with a selling cost of ₹15 per unit. There is not stock at the beginning and end of the month.

***No. of units produced:***

| | |
|---|---|
| Process I | 6,600 units; |
| Process II | 5,200 units, |
| Process III | 4,800 units and |
| Product Z | 600 units |

***You are required to prepare accounts for:***

***(1)*** Process I, II and III

***(2)*** By product process.

## *Answer*

### *(1) Process I Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Materials | 7,000 | 1,40,000 | By Normal Loss (5% @ ₹10 per unit) | 350 | 3,500 |
| To Other materials | | 62,000 | By Process II Account @ ₹50.9022 per unit | 6,600 | 3,35,955 |
| To Direct wages | | 42,000 | By Abnormal Loss @ ₹50.9022 per unit | 50 | 2,545 |
| To Direct expenses | | 14,000 | | | |
| To Production OH (200% of ₹42,000) | | 84,000 | | | |
| | *7,000* | *3,42,000* | | *7,000* | *3,42,000* |

***Production OH Rate*** = (Production OH ÷ Direct wages) × 100
= [2,88,000 ÷ (42,000 + 54,000 + 48,000)] × 100 = ***200%***

$$\textit{NCPU} = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{3{,}42{,}000 - 3{,}500}{7{,}000 - 350} = ₹50.9022 \text{ p. u.}$$

### *Process II Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Process I Account | 6,600 | 3,35,955 | By Normal Loss (10% @ ₹10 per unit) | 660 | 6,600 |
| To Other materials | | 1,36,000 | By Abnormal Loss @ ₹108.3089 per unit | 740 | 80,149 |
| To Direct wages | | 54,000 | By Process III Account @ ₹108.3089 per unit | 5,200 | 5,63,206 |
| To Direct expenses | | 16,000 | | | |
| To Production OH (200% of ₹54,000) | | 1,08,000 | | | |
| | *6,600* | *6,49,955* | | *6,600* | *6,49,955* |

$$\textit{NCPU} = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{6{,}49{,}955 - 6{,}600}{6{,}600 - 660} = ₹108.3089 \text{ p. u.}$$

### *Process III Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Process II Account | 5,200 | 5,63,206 | By Normal Loss (5% @ ₹10 per unit) | 260 | 2,600 |
| To Other materials | | 84,200 | By By-Product Z @ ₹35 (135 – 85 - 15) p. u. | 600 | 21,000 |
| To Direct wages | | 48,000 | By Product X @ ₹180.1396 per unit | 4,800 | 8,64,670 |
| To Direct expenses | | 14,000 | | | |
| To Production OH (200% of ₹16,000) | | 96,000 | | | |
| To Abnormal Gain A/c @ ₹180.1396 per unit | 460 | 82,864 | | | |
| | *5,660* | *8,88,270* | | *5,660* | *8,88,270* |

$$NCPU = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units} - \text{Net realisable value of By Product Z}}{\text{Total Units} - \text{Normal Loss Units} - \text{By product units}}$$

$$= \frac{8{,}05{,}406 - 2{,}600 - 21{,}000}{5{,}200 - 260 - 600} = ₹180.1396 \text{ p. u.}$$

### (2) By-Product Process Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process III Account | 600 | 21,000 | By Product Z @ ₹135 p. u. | 600 | 81,000 |
| To Processing cost @ ₹85 p. u. | | 51,000 | | | |
| To Selling exp @ ₹15 p. u. | | 9,000 | | | |
| | **600** | **81,000** | | **600** | **81,000** |

## STATEMENT OF PROFIT

### BQ 9

A product passes through three processes A, B and C. The details of expenses incurred on the three processes during the year 2023 were as under:

| Details | Process A | Process B | Process C |
|---|---|---|---|
| Units introduced (cost per unit ₹50) | 1,000 | - | - |
| Sundry Materials | ₹1,000 | ₹1,500 | ₹500 |
| Labour | ₹2,600 | ₹8,000 | ₹6,392 |
| Direct Expenses | ₹600 | ₹1,815 | ₹2,720 |
| Selling price per unit of output | ₹70 | ₹100 | ₹200 |

Actual output of the three processes was-Process A: 930 units; Process B: 540 units; and process C: 210 units. Two-third of output of Process A and one-half of the output of Process B was passed on to the next process and the balance was sold. The entire output of process C was sold.

The normal loss of the three processes, calculated on the input of every process was:
Process A: 5% Process B: 15% and Process C: 20%. The loss of Process A was sold at ₹1 per unit that of Process B at ₹3 per unit and that of Process C at ₹6 per unit.

Selling and distribution expenses during the year were ₹9,000. These are not allocable to the processes but to be considered while drawing the income statement.

***Prepare the three process accounts and a statement of income.***

***[A: 930 units, ₹53,010; B 540 units, ₹47,520; C 210 units, ₹32,130; Net Profit ₹7,243]***

### BQ 10

A Product passes through three processes A, B and C. The details of expenses incurred on the three processes during the year 2023 were as under:

| Details | Process A | Process B | Process C |
|---|---|---|---|
| Units introduced (cost per unit ₹100) | 10,000 | - | - |
| Sundry Materials | ₹10,000 | ₹15,000 | ₹5,000 |
| Labour | ₹30,000 | ₹80,000 | ₹65,000 |
| Direct Expenses | ₹6,000 | ₹18,150 | ₹27,200 |
| Selling price per unit of output | ₹120 | ₹165 | ₹250 |

Management expenses during the year were ₹80,000 and selling expenses were ₹50,000. These are not allocable to the processes. Actual output of the three processes was A: 9,300 units, B: 5,400 units and C: 2,100 units.

Two-third of the output of Process A and one-half of the output of Process B was passed to the next process and the balance was sold. The entire output of Process C was sold. The normal loss of the three processes, calculated on the input of every process was Process A: 5%; B: 15% and C: 20%.

The loss of process A was sold at ₹2 per unit that of B at ₹5 per unit and of Process C at ₹10 per unit.

*Prepare the three process Account and the Profit and Loss Account.*

## *Answer*

### *Process A Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Units Introduced | 10,000 | 10,00,000 | By Normal Loss | 500 | 1,000 |
| To Sundry Materials | | 10,000 | (5% @ ₹2 per unit) | | |
| To Labour | | 30,000 | By Abnormal Loss A/c | 200 | 22,000 |
| To Direct Expenses | | 6,000 | By Process B Account | 6,200 | 6,82,000 |
| | | | By Profit and Loss A/c | 3,100 | 3,41,000 |
| | ***10,000*** | ***10,46,000*** | | ***10,000*** | ***10,46,000*** |

### *Process B Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process A Account | 6,200 | 6,82,000 | By Normal Loss | 930 | 4,650 |
| To Sundry Materials | | 15,000 | (15% @ ₹5 per unit) | | |
| To Labour | | 80,000 | By Process C Account | 2,700 | 4,05,000 |
| To Direct Expenses | | 18,150 | By Profit and Loss A/c | 2,700 | 4,05,000 |
| To Abnormal Gain A/c | 130 | 19,500 | | | |
| | ***6,330*** | ***8,14,650*** | | ***6,330*** | ***6,98,600*** |

### *Process C Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process B Account | 2,700 | 4,05,000 | By Normal Loss | 540 | 5,400 |
| To Sundry Materials | | 5,000 | (20% @ ₹10 per unit) | | |
| To Labour | | 65,000 | By Abnormal Loss A/c | 60 | 13,800 |
| To Direct Expenses | | 27,200 | By Profit and Loss A/c | 2,100 | 4,83,000 |
| | ***2,700*** | ***5,02,200*** | | ***2,700*** | ***5,02,200*** |

### *Abnormal Loss A/c*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process A A/c | 200 | 22,000 | By Cash A/c: | | |
| To Process C A/c | 60 | 13,800 | Scrap of A | 200 | 400 |
| | | | Scrap of B | 60 | 600 |
| | | | By Profit and Loss A/c | | 34,800 |
| | ***260*** | ***35,800*** | | ***260*** | ***35,800*** |

### *Abnormal Gain A/c*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Normal Loss A/c | 130 | 650 | By Process B A/c | 130 | 19,500 |
| (Scrap normal @ ₹5 p.u.) | | | | | |
| To Profit and Loss A/c | | 18,850 | | | |
| | ***130*** | ***19,500*** | | ***130*** | ***19,500*** |

### *Profit and Loss Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process A A/c | 3,100 | 3,41,000 | By Sales: | | |
| To Process B A/c | 2,700 | 4,05,000 | Process A | 3,100 | 3,72,000 |
| To Process C A/c | 2,100 | 4,83,000 | Process B | 2,700 | 4,45,500 |
| To Abnormal Loss A/c | | 34,800 | Process C | 2,100 | 5,25,000 |
| To Management Exp | | 80,000 | By Abnormal Gain A/c | | 18,850 |
| To Selling Expenses | | 50,000 | By Net Loss | | 32,450 |
| | ***7,900*** | ***13,93,800*** | | ***7,900*** | ***13,93,800*** |

### *Working Notes:*

***1.*** ***(i)*** Normal cost per unit under Process A: (₹10,46,000 - ₹1,000) ÷ (10,000 - 500) = ₹110.

***(ii)*** Value of abnormal loss under Process A: (10,000 - 500) - 9,300 = 200 units; 200 units @ ₹110 i.e. ₹22,000

***(iii)*** Value of units transferred to Process B: 9,300 × 213 = 6,200 units; 6,200 × 110 = ₹6,82,000

***(iv)*** Value of units sold in Process A: 3100 × ₹110 = ₹3,41,000

**2.** ***(i)*** Normal cost per unit under Process B: (₹7,95,150 - ₹4,650) ÷ (6,200 - 930) = ₹150

***(ii)*** Value of abnormal gain Process B: 130 units × ₹150 = ₹19,500

***(iii)*** Value of units transferred to Process C: 2700 units × ₹150 = ₹4,05,000

***(iv)*** Value of units sold in Process C: 2700 × ₹150 = ₹4,05,000

**3.** ***(i)*** Normal cost per unit under Process C: (₹5,02,200 - ₹5,400) ÷ (2,700 - 540) = ₹230

***(ii)*** Value of abnormal loss under Process C: 60 × ₹230 = ₹13,800

***(iii)*** Value of units finished in Process C: 2,100 × ₹230 = ₹4,83,000

***Note:***

**1.** A doubt may arise in the mind of readers why Process A, Process B and Process C have not been credited with ₹37,200; ₹4,45,500 and ₹52,500 respectively for direct sales. Here basic difference between a process account and a profit and loss account should be understood. While profit and loss account is prepared for arriving at the figure of profit for the relevant year, a process account is prepared preliminary to value the units produced, units in process, abnormal loss and abnormal gain. It is also assumed that Process A, Process B and Process C are not responsibility centres; because in some situations a process can be a responsibility centre as well. If process had been responsibility centre, then only direct sales might have been credited to process account. In normal case, value (and not the sale) of direct sale should be credited to process account.

**2.** Management expenses and selling expenses are not linked with any process. Therefore, these expenses will be debited to profit and loss account directly.

## *PROCESS STOCK ACCOUNT*

### *BQ 11*

The product of a Company passes through three different process A, B and C. It is ascertained from past experience that wastage in each process is incurred as under:

Process A : 2%     Process B : 5%     Process C : 10%.

The percentage of wastage in each case is computed on the basis of number of units entering the process concerned. The wastage of each process has a scrap value. The wastage of process A and B is sold at ₹1 per unit and that of process C at ₹4 per unit.

***The Company gives you the following information for the months of July, 2023:***

2,000 units of crude material were introduced in process A at a Cost of ₹8 per unit. Besides this the following were other expenses:

| *Details* | *Process A* | *Process B* | *Process C* |
|---|---|---|---|
| Materials consumed | 8,000 | 3,000 | 2,000 |
| Direct labour | 12,000 | 8,000 | 6,000 |
| Works expenses | 2,000 | 1,000 | 3,000 |
| Output (Units) | 1,950 | 1,925 | 1,590 |
| Finished process stock: | | | |
| On 01.07.2023 | 200 | 300 | 500 |
| On 31.07.2023 | 150 | 400 | Nil |
| Stock valuation on 01.07.2023 | ₹19.00 per unit | ₹27.00 per unit | ₹36.50 per unit |

***Stock on 31st July, 2023 is to be valued at cost as shown by month's production accounts. Prepare the process Account and process stock account.***

***Answer***

**Process A Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Units introduced | 2,000 | 16,000 | By Normal wastage (2% @ ₹1.00 per unit) | 40 | 40 |
| To Materials consumed | | 8,000 | By Process A stock A/c @ ₹19.367 per unit | 1,950 | 37,766 |
| To Direct wages | | 12,000 | By Abnormal Loss A/c @ ₹19.367 per unit | 10 | 194 |
| To Works expenses | | 2,000 | | | |
| | **2,000** | **38,000** | | **2,000** | **38,000** |

$$NCPU = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{38,000 - 40}{2,000 - 40} = ₹19.367 \text{ per unit}$$

**Process A Stock Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Balance b/d @ ₹19.00 per unit | 200 | 3,800 | By Process B A/c (b.f.) | 2,000 | 38,661 |
| To Process A A/c | 1,950 | 37,766 | By Balance c/d @ ₹19.367 per unit | 150 | 2,905 |
| | **2,150** | **41,566** | | **2,150** | **41,566** |

**Process B Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process A stock A/c | 2,000 | 38,661 | By Normal wastage (5% @ ₹1.00 per unit) | 100 | 100 |
| To Materials consumed | | 3,000 | By Process B stock A/c @ ₹26.611 per unit | 1,925 | 51,226 |
| To Direct wages | | 8,000 | | | |
| To Works expenses | | 1,000 | | | |
| To Abnormal gain A/c @ ₹26.611 per unit | 25 | 665 | | | |
| | **2,025** | **51,326** | | **2,025** | **51,326** |

$$NCPU = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{50,661 - 100}{2,000 - 100} = ₹26.611 \text{ per unit}$$

**Process B Stock Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Balance b/d @ ₹27.00 per unit | 300 | 8,100 | By Process C A/c (b.f.) | 1,825 | 48,682 |
| To Process B A/c | 1,925 | 51,226 | By Balance c/d @ ₹26.611 per unit | 400 | 10,644 |
| | **2,225** | **59,326** | | **2,225** | **59,326** |

**Process C Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process B stock A/c | 1,825 | 48,682 | By Normal wastage (10% @ ₹4 per unit) | 183 | 732 |
| To Materials consumed | | 2,000 | By Process C stock A/c @ ₹35.901 per unit | 1,590 | 57,083 |
| To Direct wages | | 6,000 | By Abnormal Loss A/c @ ₹35.901 per unit | 52 | 1,867 |
| To Works expenses | | 3,000 | | | |
| | **1,825** | **59,682** | | **1,825** | **59,682** |

$$NCPU = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{59,682 - 732}{1,825 - 183} = ₹35.901 \text{ per unit}$$

**Process C Stock Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Balance b/d @ ₹36.50 per unit | 500 | 18,250 | By Finished goods stock A/c | 2,090 | 75,333 |

| | | | | | |
|---|---|---|---|---|---|
| To Process C A/c | 1,590 | 57,083 | | | |
| | ***2,090*** | ***75,333*** | | ***2,090*** | ***75,333*** |

## BQ 12

The product manufactured by the Standard Chemicals Ltd. passes through three processes I, II and III. The following costs have been incurred for the month of September 2023:

| Details | Process I | Process II | Process III |
|---|---|---|---|
| Materials consumed | 40,000 | 7,500 | 5,000 |
| Direct wages | 22,500 | 10,000 | 10,000 |
| Direct expenses | 20,500 | 2,250 | 2,505 |
| Output (Units) | 3,900 | 3,850 | 3,200 |
| Finished process stock: | | | |
| On 01.09.2023 | 600 | 550 | 800 |
| On 30.09.2023 | 500 | 800 | Nil |
| Stock valuation on 01.09.223 | ₹24.50 per unit | ₹31.00 per unit | ₹37.00 per unit |
| Percentage of wastage | 2 | 5 | 10 |
| Net realizable value of wastage | ₹13.50 | ₹16.25 | ₹21.00 |

Four thousand units of raw materials were introduced in Process No I at a cost of ₹20,000. Stocks are valued and transferred to subsequent processes ***at weighted average cost***. The percentage of wastage is computed on the number of units entering the process concerned.

***Prepare (i) Process A/c; (ii) Process Stock A/c; (iii) Normal Wastage A/c; (iv) Abnormal Wastage and Effective A/c.***

## Answer

***Process I Account***

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Units introduced | 4,000 | 20,000 | By Normal wastage | 80 | 1,080 |
| To Materials consumed | | 40,000 | (2% @ ₹13.50 per unit) | | |
| To Direct wages | | 22,500 | By Abnormal Loss A/c | 20 | 520 |
| To Direct expenses | | 20,500 | By Process I stock A/c | 3,900 | 1,01,400 |
| | ***4,000*** | ***1,03,000*** | | ***4,000*** | ***1,03,000*** |

***Process I Stock Account***

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Balance b/d @ ₹24.50 | 600 | 14,700 | By Process II A/c | 4,000 | 1,03,200 |
| To Process I A/c | 3,900 | 1,01,400 | By Balance c/d @ ₹25.8 | 500 | 12,900 |
| | ***4,500*** | ***1,16,100*** | | ***4,500*** | ***1,16,100*** |

***Process II Account***

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process I stock A/c | 4,000 | 1,03,200 | By Normal wastage | 200 | 3,250 |
| To Materials consumed | | 7,500 | (5% @ ₹16.25 per unit) | | |
| To Direct wages | | 10,000 | By Process II stock A/c | 3,850 | 1,21,275 |
| To Direct expenses | | 2,250 | | | |
| To Abnormal eff A/c | 50 | 1,575 | | | |
| | ***4,050*** | ***1,24,525*** | | ***4,050*** | ***1,24,525*** |

***Process II Stock Account***

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Balance b/d | 550 | 17,050 | By Process III A/c | 3,600 | 1,13,175 |
| (@ ₹31 per unit) | | | By Balance c/d | 800 | 25,150 |
| To Process II A/c | 3,850 | 1,21,275 | (@ ₹31.44 per unit) | | |
| | ***4,400*** | ***1,38,325*** | | ***4,400*** | ***1,38,325*** |

### Process III Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process II stock A/c | 3,600 | 1,13,175 | By Normal wastage (10% @ ₹21 per unit) | 360 | 7,560 |
| To Materials consumed | | 5,000 | | | |
| To Direct wages | | 10,000 | By Abnormal Loss A/c | 40 | 1,520 |
| To Direct expenses | | 2,505 | By Process I stock A/c | 3,200 | 1,21,600 |
| | **3,600** | **1,30,680** | | **3,600** | **1,30,680** |

### Process III Stock Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Balance b/d (@ ₹37 per unit) | 800 | 29,600 | By Finished goods stock A/c @ ₹37.80 per unit | 4,000 | 1,51,200 |
| To Process III A/c | 3,200 | 1,21,600 | | | |
| | **4,000** | **1,51,200** | | **4,000** | **1,51,200** |

### Normal Wastage A/c

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process I A/c | 80 | 1,080 | By Cash A/c: | | |
| To Process II A/c | 200 | 3,250 | Process I A/c | 80 | 1,080 |
| To Process III A/c | 360 | 7,560 | Process II A/c | 150 | 2,437.50 |
| | | | Process III A/c | 360 | 7,560 |
| | | | By Abnormal Eff. A/c | 50 | 812.50 |
| | **640** | **11,890** | | **640** | **11,890** |

### Abnormal Wastage A/c

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process I A/c | 20 | 520 | By Cash A/c: | | |
| To Process III A/c | 40 | 1,520 | Process I A/c | 20 | 270 |
| | | | Process III A/c | 40 | 840 |
| | | | By Profit and Loss A/c | | 930 |
| | **60** | **2,040** | | **60** | **2,040** |

### Abnormal Effective A/c

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Normal Wastage A/c | 50 | 812.50 | By Process II A/c | 50 | 1,575 |
| To Profit and Loss A/c | | 762.50 | | | |
| | **50** | **1,575** | | **50** | **1,575** |

## INPUT – OUTPUT RATIO

### BQ 13

An article passes through three successive operations from raw material stage to the finished goods stage. The following data are available from the production records for the month of March:

| Operation | No. of pieces (Input) | No. of pieces (Rejected) | No. of pieces (Output) |
|---|---|---|---|
| 1 | 1,80,000 | 60,000 | 1,20,000 |
| 2 | 1,98,000 | 18,000 | 1,80,000 |
| 3 | 1,44,000 | 24,000 | 1,20,000 |

**(1)** Determine the input required to be introduced in the first operation in no. of pieces in order to obtain finished output of 500 pieces after the last operation.

**(2)** Calculate the cost of raw material required to produce one piece of finished product. If the weight of the finished piece is 0.5 Kg. and the price of raw material is ₹80 per kg.

### Answer

**(1) Determination the input required to obtain finished output of 500 pieces after the last operation:**

| Particulars | No. of pieces |
|---|---|
| Output required after operation 3 | 500 |
| Add: Rejection in operation 3 (20%) | 100 |
| Output required after operation 2 | 600 |
| Add: Rejection in operation 2 (10%) | 60 |
| Output required after operation 1 | 660 |
| Add: Rejection in operation 1 (50%) | 330 |
| ***Input required in operation 1*** | ***990*** |

**(2) Calculation of cost of raw material:**

To get a finished piece of 0.5 kg of output, the weight of input required = $\frac{990}{500} \times 0.5$ kg
= 0.99 Kg raw material

Cost of raw material 0.99 kg to produce 1 piece of finished goods = 0.99 × ₹80
= ***₹79.20***

***Working Note:***

***Statement of production***

| Operation | Input | Rejections | | Output |
|---|---|---|---|---|
| | | Total | % of output | |
| 1 | 1,80,000 | 60,000 | 50% | 1,20,000 |
| 2 | 1,98,000 | 18,000 | 10% | 1,80,000 |
| 3 | 1,44,000 | 24,000 | 20% | 1,20,000 |

## EQUIVALENT PRODUCTION (CLOSING WIP ONLY)

### BQ 14

An English willow company who manufactures cricket bat buys wood as its direct material. The Forming department processes the cricket bats and the cricket bats are then transferred to the Finishing department where stickers are applied. The Forming department began manufacturing 10,000 initial bats during the month of December for the first time and their cost is as follows:

| | |
|---|---|
| Direct material | ₹33,000 |
| Conversion costs | ₹17,000 |
| Total | ₹50,000 |

A total of 8,000 cricket bats were completed and transferred to the Finishing department, the rest 2,000 were still in the Forming process at the end of the month. All of the forming departments direct material were placed, but, on average, only 25% of the conversion costs was applied to the ending work in progress inventory.

***Calculate:***

***(A)*** Equivalent units of production for each cost.
***(B)*** The Conversion cost per Equivalent units.
***(C)*** Cost of closing work in process (WIP) and finished products.

***Answer***

***(A) Statement of Equivalent Production***

| Particulars | Units | Materials | | Conversion Cost | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Finished Output | 8,000 | 100 | 8,000 | 100 | 8,000 |
| Closing WIP | 2,000 | 100 | 2,000 | 25 | 500 |
| ***Total*** | ***10,000*** | - | ***10,000*** | - | ***8,500*** |

***(B) Statement of Cost per Equivalent Unit***

| Elements | Cost | Eq. Units | Cost Per Unit |
|---|---|---|---|
| Materials | 33,000 | 10,000 | ₹3.30 |
| Conversion Cost | 17,000 | 8,500 | ₹2.00 |
| Total cost per unit | | | ₹5.30 |

### (C) Statement Showing Cost of Finished Output and Closing WIP

| Particulars | Elements | Equivalent Units | Cost Per Unit | Total (₹) |
|---|---|---|---|---|
| Finished Output | All | 8,000 | 5.30 | ***42,400*** |
| Closing WIP | Materials | 2,000 | 3.30 | 6,600 |
| | Conversion Cost | 500 | 2.00 | 1,000 |
| | | | | ***7,600*** |

## BQ 15

AB Ltd. is engaged in the process engineering industry. During the month of April 2023, 2,000 units were introduced in Process X. The normal loss is estimated at 5% of input.

At the end of the month 1,400 units had been produced and transferred to Process Y; 460 were incomplete units and 140 units had to be scrapped at the end of the process. The incomplete units reached the following degree of completion:

Materials: 75% Labour: 50% Overheads: 50%

***Following are the further details regarding Process X:***

| | |
|---|---|
| Cost of 2,000 units introduced | ₹58,000 |
| Additional materials consumed | ₹14,400 |
| Direct labour | ₹33,400 |
| Allocated overheads | ₹16,700 |

***Note: The scrapped units fetched ₹10 each***

***Required:***

***(A)*** Statement of Equivalent Production;

***(B)*** Statement of Cost;

***(C)*** Statement of Evaluation;

***(D)*** Process X Account.

## Answer

### (A) Statement of Equivalent Production

| Particulars | Units | Materials | | Labour & Overhead | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Normal Loss | 100 | - | - | - | - |
| Abnormal Loss | 40 | 100 | 40 | 100 | 40 |
| Transfer to Process Y | 1,400 | 100 | 1,400 | 100 | 1,400 |
| Closing WIP | 460 | 75 | 345 | 50 | 230 |
| ***Total*** | ***2,000*** | - | ***1,785*** | - | ***1,670*** |

### (B) Statement of Cost

| Elements | Cost | Eq. Units | Cost Per Unit |
|---|---|---|---|
| Materials | 58,000 + 14,400 – 1,000 = 71,400 | 1,785 | ₹40.00 |
| Labour | 33,400 | 1,670 | ₹20.00 |
| Overheads | 16,700 | 1,670 | ₹10.00 |
| Total cost per unit | | | ₹70.00 |

### (C) Statement of Evaluation

| Particulars | Elements | Equivalent Units | Cost Per Unit | Total (₹) |
|---|---|---|---|---|
| Abnormal Loss | Materials | 40 | 40 | 1,600 |
| | Labour | 40 | 20 | 800 |
| | Overhead | 40 | 10 | 400 |
| | | | | ***2,800*** |

| | | | | |
|---|---|---|---|---|
| Transfer to Process Y | Materials | 1,400 | 40 | 56,000 |
| | Labour | 1,400 | 20 | 28,000 |
| | Overhead | 1,400 | 10 | 14,000 |
| | | | | **98,000** |
| Closing WIP | Materials | 345 | 40 | 13,800 |
| | Labour | 230 | 20 | 4,600 |
| | Overhead | 230 | 10 | 2,300 |
| | | | | **20,700** |

***(D) Process X Account***

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Units Introduced | 2,000 | 58,000 | By Normal wastage | 100 | 1,000 |
| To Materials | | 14,400 | (5% @ ₹10 per unit) | | |
| To Labour | | 33,400 | By Abnormal Loss A/c | 40 | 2,800 |
| To Overheads | | 16,700 | By Closing WIP | 460 | 20,700 |
| | | | By Process Y Account | 1,400 | 98,000 |
| | **2,000** | **1,22,500** | | **2,000** | **1,22,500** |

### BQ 16

A company within the food industry mixes powdered ingredients in two different processes to produce one product. The output of process 1 becomes the input process 2 and the output of process 2 is transferred to the packing department.

***From the information given below, you are required to open accounts of process 1 and process 2:***

***Process 1***

No work-in-progress in process 1 at the beginning or end of the week.

***Input:***

| | |
|---|---|
| Material A | 6,000 kgs at ₹0.50 per kg |
| Material B | 4,000 kgs at ₹1 per kg |
| Mixing labour | 430 hours at ₹2 per hour |
| Normal loss 5% of weight input | disposed of at ₹0.16 per kg |
| Output | 9,200 kgs |

***Process 2***

***Input:***

| | |
|---|---|
| Material C | 6,600 kgs at ₹1.25 per kg |
| Material D | 4,200 kgs at ₹0.75 per kg |
| Flavour essence | ₹330 |
| Mixing labour | 370 hours at ₹2 per hour |
| Normal waste 5% of weight input | with no disposal value |
| Output | 18,000 kgs |

No work in process 2 at the beginning of the week but 1,000 kilograms in process at the end of the week and estimated to be only 50% complete so far as labour and overhead were concerned. Overhead of ₹3,200 were incurred by the two processes to be absorbed on the basis of mixing labour hours.

### Answer

***Process 1 Account***

| Particulars | Kgs | ₹ | Particulars | Kgs | ₹ |
|---|---|---|---|---|---|
| To Material A | 6,000 | 3,000 | By Normal wastage | 500 | 80 |
| To Material B | 4,000 | 4,000 | (5% @ ₹0.16 per kg) | | |
| To Mixing labour | | 860 | By Process 2 A/c | 9,200 | 9,200 |
| (430 hours × ₹2) | | | @ ₹1 per kg | | |
| To Overheads | | 1,720 | By Abnormal Loss A/c | 300 | 300 |
| | | | @ ₹1 per kg | | |
| | **10,000** | **9,580** | | **10,000** | **9,580** |

**Working Note:**

$$\textbf{NCPU} = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{9{,}580 - 80}{10{,}000 - 500} = ₹1 \text{ per kg}$$

$$\textbf{Overheads (Process 1)} = \left(\frac{3{,}200}{860+740} \times 860\right) = ₹1{,}720$$

**Process 2 Account**

| Particulars | Kgs | ₹ | Particulars | Kgs | ₹ |
|---|---|---|---|---|---|
| To Process 1 A/c | 9,200 | 9,200 | By Normal wastage | 1,000 | - |
| To Material C | 6,600 | 8,250 | (5% @ ₹0.00 per kg) | | |
| To Material D | 4,200 | 3,150 | By Finished Goods A/c | 18,000 | 21,988 |
| To Flavour essence | | 330 | By Closing WIP | 1,000 | 1,162 |
| To Mixing labour (370 hours × ₹2) | | 740 | | | |
| To Overheads | | 1,480 | | | |
| | **20,000** | **23,150** | | **20,000** | **23,150** |

$$\textbf{Overheads (Process 2)} = \left(\frac{3{,}200}{860+740} \times 740\right) = ₹1{,}480$$

**Statement of Equivalent Production (Process 2)**

| Particulars | Kgs | Materials | | Labour & Overhead | |
|---|---|---|---|---|---|
| | | % | Eq. kgs | % | Eq. kgs |
| Normal Loss | 1,000 | - | - | - | - |
| Finished Goods | 18,000 | 100 | 18,000 | 100 | 18,000 |
| Closing WIP | 1,000 | 100 | 1,000 | 50 | 500 |
| **Total** | **20,000** | **-** | **19,000** | **-** | **18,500** |

**Statement of Cost**

| Elements | Cost | Equivalent Kgs | Cost Per Unit |
|---|---|---|---|
| Materials | 9,200 + 8,250 + 3,150 + 330 = 20,930 | 19,000 | ₹1.1016 |
| Labour | 740 | 18,500 | ₹0.0400 |
| Overheads | 1,480 | 18,500 | ₹0.0800 |
| Total cost per unit | | | ₹1.2216 |

**Statement of Apportionment of Cost**

| Particulars | Elements | Equivalent Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Finished Goods | Mat, Lab & OH | 18,000 | 1.2216 | **21,988** |
| Closing WIP | Materials | 1,000 | 1.1016 | 1,102 |
| | Lab & OH | 500 | 0.04 + 0.08 | 60 |
| | | | | **1,162** |

**BQ 17**

Following data are available for a product for the month of March 2023:

| | Process I | Process II |
|---|---|---|
| Opening Work-in-progress | Nil | Nil |
| **Costs Incurred during the month:** | | |
| Direct materials | 60,000 | - |
| Labour | 12,000 | 16,000 |
| Factory Overheads | 24,000 | 20,000 |
| **Units of Production:** | | |
| Received in Process | 40,000 | 36,000 |
| Completed and Transferred | 36,000 | 32,000 |

| | | |
|---|---|---|
| Closing Work-in-Progress | 2,000 | ? |
| Normal Loss in Process | 2,000 | 1,500 |

***Production remaining in process has to be valued as follows:***

| | |
|---|---|
| Materials | 100% |
| Labour | 50% |
| Overheads | 50% |

There has been no abnormal loss in Process II.

***Prepare process account after working out the missing figure and with detailed workings.***

## *Answer*

### *Process I Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Units Introduced | 40,000 | 60,000 | By Normal wastage | 2,000 | - |
| To Labour | | 12,000 | By Process II Account | 36,000 | 91,869 |
| To Overheads | | 24,000 | By Closing WIP | 2,000 | 4,131 |
| | ***40,000*** | ***96,000*** | | ***40,000*** | ***96,000*** |

### *Statement of Equivalent Production (Process I)*

| Particulars | Units | Materials | | Labour & Overhead | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Normal Loss | 2,000 | - | - | - | - |
| Transfer to Process II | 36,000 | 100 | 36,000 | 100 | 36,000 |
| Closing WIP | 2,000 | 100 | 2,000 | 50 | 1,000 |
| ***Total*** | ***40,000*** | - | ***38,000*** | - | ***37,000*** |

### *Statement of Cost*

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 60,000 | 38,000 | ₹1.5789 |
| Labour | 12,000 | 37,000 | ₹0.3243 |
| Overheads | 24,000 | 37,000 | ₹0.6487 |
| Total cost per unit | | | ₹2.5519 |

### *Statement of Apportionment of Cost*

| Particulars | Elements | Equivalent Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Transfer to Process II | Materials | 36,000 | 1.5789 | 56,841 |
| | Labour | 36,000 | 0.3243 | 11,675 |
| | Overhead | 36,000 | 0.6487 | 23,353 |
| | | | | ***91,869*** |
| Closing WIP | Materials | 2,000 | 1.5789 | 3,158 |
| | Labour | 1,000 | 0.3243 | 324 |
| | Overhead | 1,000 | 0.6487 | 649 |
| | | | | ***4,131*** |

### *Process II Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process II A/c | 36,000 | 91,869 | By Normal wastage | 1,500 | - |
| To Labour | | 16,000 | By Finished Stock | 32,000 | 1,19,859 |
| To Overheads | | 20,000 | By Closing WIP | 2,500 | 8,010 |
| | ***36,000*** | ***1,27,869*** | | ***36,000*** | ***1,27,869*** |

### *Statement of Apportionment of Cost (Process II)*

| Particulars | Elements | Equivalent Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Finished Goods | Materials | 32,000 | 2.6629 | 85,213 |

| | | | | |
|---|---|---|---|---|
| | Labour | 32,000 | 0.4812 | 15,398 |
| | Overhead | 32,000 | 0.6015 | 19,248 |
| | | | | ***1,19,859*** |
| Closing WIP | Materials | 2,500 | 2.6629 | 6,657 |
| | Labour | 1,250 | 0.4812 | 601 |
| | Overhead | 1,250 | 0.6015 | 752 |
| | | | | ***8,010*** |

***Statement of Cost***

| *Elements* | *Cost* | *Equivalent Units* | *Cost Per Unit* |
|---|---|---|---|
| Materials | 91,869 | 34,500 | ₹2.6629 |
| Labour | 16,000 | 33,250 | ₹0.4812 |
| Overheads | 20,000 | 33,250 | ₹0.6015 |
| Total cost per unit | | | ₹3.7456 |

***Statement of Equivalent Production (Process II)***

| *Particulars* | *Units* | *Materials* | | *Labour & Overhead* | |
|---|---|---|---|---|---|
| | | *%* | *Eq. Unit* | *%* | *Eq. Unit* |
| Normal Loss | 1,500 | - | - | - | - |
| Finished Goods | 32,000 | 100 | 32,000 | 100 | 32,000 |
| Closing WIP | 2,500 | 100 | 2,500 | 50 | 1,250 |
| ***Total*** | ***36,000*** | *-* | ***34,500*** | *-* | ***33,250*** |

### *BQ 18*

A company manufactures a product which involves two consecutive processes viz. Pressing and Polishing. For the month of December, 2023 the following information is available:

| | *Pressing* | *Polishing* |
|---|---|---|
| Opening stocks | - | - |
| Input of units in process | 1,200 | 1,000 |
| Units completed | 1,000 | 500 |
| Units under process | 200 | 500 |
| Materials cost | ₹96,000 | ₹8,000 |
| Conversion Cost (Labour + Factory OH) | ₹3,36,000 | ₹54,000 |

For incomplete units in process charge materials cost at 100% and conversion cost at 60% in the Pressing process and at 50% in Polishing process.

***Prepare a statement of cost and calculate the selling price per unit which will result in 25% profit on sale price.***

### *Answer*

***Statement of Equivalent Production (Pressing)***

| *Particulars* | *Units* | *Materials* | | *Labour & Overhead* | |
|---|---|---|---|---|---|
| | | *%* | *Eq. Unit* | *%* | *Eq. Unit* |
| Transfer to Polishing | 1,000 | 100 | 1,000 | 100 | 1,000 |
| Closing WIP | 200 | 100 | 200 | 60 | 120 |
| ***Total*** | ***1,200*** | *-* | ***1,200*** | *-* | ***1,120*** |

***Statement of Cost (Pressing)***

| *Elements* | *Cost* | *Equivalent Units* | *Cost Per Unit* |
|---|---|---|---|
| Materials | 96,000 | 1,200 | 80 |
| Labour and Overheads | 3,36,000 | 1,120 | 300 |

***Statement of Equivalent Production (Polishing)***

| *Particulars* | *Units* | *Materials* | | *Labour & Overhead* | |
|---|---|---|---|---|---|
| | | *%* | *Eq. Unit* | *%* | *Eq. Unit* |

| | | | | | |
|---|---|---|---|---|---|
| Finished Goods<br>Closing WIP | 500<br>500 | 100<br>100 | 500<br>500 | 100<br>50 | 500<br>250 |
| ***Total*** | ***1,000*** | - | ***1,000*** | - | ***750*** |

***Statement of Apportionment of Cost (Pressing)***

| *Particulars* | *Elements* | *Equivalent Units* | *Cost Per Unit* | *Total* |
|---|---|---|---|---|
| Transfer to Polishing | Materials | 1,000 | 80 | 80,000 |
| | Labour and OH | 1,000 | 300 | 3,00,000 |
| | | | | ***3,80,000*** |
| Closing WIP | Materials | 200 | 80 | 16,000 |
| | Labour and OH | 120 | 300 | 36,000 |
| | | | | ***52,000*** |

***Statement of Apportionment of Cost (Polishing)***

| *Particulars* | *Elements* | *Equivalent Units* | *Cost Per Unit* | *Total* |
|---|---|---|---|---|
| Units Completed | Materials | 500 | 388 | 1,94,000 |
| | Labour and OH | 500 | 72 | 36,000 |
| | | | | ***2,30,000*** |
| Closing WIP | Materials | 500 | 388 | 1,94,000 |
| | Labour and OH | 250 | 72 | 18,000 |
| | | | | ***2,12,000*** |

***Statement of Cost (Polishing)***

| *Elements* | *Cost* | *Equivalent Units* | *Cost Per Unit* |
|---|---|---|---|
| Materials | 3,80,000 + 8,000 = 3,88,000 | 1,000 | 388 |
| Labour and Overheads | 54,000 | 750 | 72 |

***Calculation of sale price:***

| | |
|---|---|
| Cost per unit (2,30,000 ÷ 500 units) | ₹460.00 |
| Add: Profit per unit @ 25% on sales | ₹153.33 |
| ***Sales price per unit (460 ÷ 75%)*** | ***₹613.33*** |

***BQ 19***

C Limited manufactures a range of products and the data below refer to one product which goes through one process only. The company operates a thirteen four weekly reporting system for process and product costs and the data given below relate to period 10. There was no opening work-in-progress stock.

| | |
|---|---|
| 5,000 units of materials input | at ₹2.94 per unit |
| Further direct materials added | 13,830 |
| Direct wages incurred | 6,555 |
| Production overheads | 7,470 |
| Normal loss | 3% of input |

Closing work-in-progress was 800 units but these were incomplete, having reached the following percentage of completion for each of the elements of cost listed.

| | | | |
|---|---|---|---|
| Direct materials added | 75% | Direct wages | 50% |
| Production overhead | 25% | | |

270 units were scrapped after a quality control check when the units were at the following degrees of completion:

| | | | |
|---|---|---|---|
| Direct materials added | 66-⅔% | Direct wages | 33-⅓% |
| Production overhead | 16-⅔% | | |

Units scrapped regardless of the degree of completion are sold for ₹1.00 each and it is company policy to credit the process account with the scrap value of normal loss units.

***You are required to prepare the Period 10 accounts for the:***

*(i)* Process account; and
*(ii)* Abnormal gain or loss.

## *Answer*

### *Process Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Units Introduced | 5,000 | 14,700 | By Normal Loss | 150 | 150 |
| To Direct Materials | | 13,830 | By Abnormal Loss A/c | 120 | 696 |
| To Labour | | 6,555 | By Finished Goods | 3,930 | 36,549 |
| To Production OH | | 7,470 | By Closing WIP | 800 | 5,160 |
| | **5,000** | **42,555** | | **5,000** | **42,555** |

### *Abnormal Loss A/c*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process A/c | 120 | 696 | By Cash A/c | 120 | 120 |
| | | | By Profit and Loss A/c | | 576 |
| | **120** | **696** | | **120** | **696** |

### *Working Notes:*

### *Statement of Equivalent Production (Process I)*

| Particulars | Units | Materials 1 | | Materials 2 | | Labour | | Overhead | |
|---|---|---|---|---|---|---|---|---|---|
| | | % | E. Unit | % | E. Unit | % | E. Unit | % | E. Unit |
| Normal Loss | 150 | - | - | - | - | - | - | - | - |
| Abnormal Loss | 120 | 100 | 120 | 66.67 | 80 | 33.33 | 40 | 16.67 | 20 |
| Finished Units | 3,930 | 100 | 3,930 | 100 | 3,930 | 100 | 3,930 | 100 | 3,930 |
| Closing WIP | 800 | 100 | 800 | 75 | 600 | 50 | 400 | 25 | 200 |
| **Total** | **5,000** | - | **4,850** | - | **4,610** | - | **4,370** | - | **4,150** |

### *Statement of Cost*

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials 1 | 14,700 – 150 = 14,550 | 4,850 | 3.00 |
| Materials 2 | 13,830 | 4,610 | 3.00 |
| Labour | 6,555 | 4,370 | 1.50 |
| Overheads | 7,470 | 4,150 | 1.80 |
| Total cost per unit | | | 9.30 |

### *Statement of Evaluation*

| Particulars | Elements | Equivalent Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Finished Units | Materials 1 | 3,930 | 3.00 | 11,790 |
| | Materials 2 | 3,930 | 3.00 | 11,790 |
| | Labour | 3,930 | 1.50 | 5,895 |
| | Overhead | 3,930 | 1.80 | 7,074 |
| | | | | **36,549** |
| Abnormal Loss | Materials 1 | 120 | 3.00 | 360 |
| | Materials 2 | 80 | 3.00 | 240 |
| | Labour | 40 | 1.50 | 60 |
| | Overhead | 20 | 1.80 | 36 |
| | | | | **696** |
| Closing WIP | Materials 1 | 800 | 3.00 | 2,400 |
| | Materials 2 | 600 | 3.00 | 1,800 |
| | Labour | 400 | 1.50 | 600 |
| | Overhead | 200 | 1.80 | 360 |
| | | | | **5,160** |

## *BQ 20*

A Company produces a component, which passes through two processes. During the month of April, materials for 40,000 components were put into Process I of which 30,000 were completed and transferred to Process II. Those not transferred to Process II were 100% complete as to materials cost and 50% complete as to labour and overheads cost.

***The Process I costs incurred were as follows:***

| | |
|---|---|
| Direct Materials | ₹6,00,000 |
| Direct Wages | ₹7,00,000 |
| Factory Overheads | ₹4,90,000 |

Of those transferred to Process II, 28,000 units were completed and transferred to finished goods stores. There was a normal loss with no salvage value of 200 units in Process II. There were 1,800 units, remained unfinished in the process with 100% complete as to material and 25% complete as regard to wages and overheads.

***Costs incurred in Process II are as follows:***

| | |
|---|---|
| Packing Materials | ₹1,60,000 |
| Direct Wages | ₹1,42,250 |
| Factory Overheads | ₹1,70,700 |

***Packing material cost is incurred at the end of the second process as protective packing to the completed units of production.***

***Required:***

***(i)*** Prepare Statement of Equivalent Production, Cost Per unit and Process I A/c

***(ii)*** Prepare State of Equivalent Production, Cost per Unit and Process II A/C

***Answer***

***Statement of Equivalent Production (Process I)***

| ***Particulars*** | ***Units*** | ***Materials*** | | ***Labour & Overhead*** | |
|---|---|---|---|---|---|
| | | ***%*** | ***Eq. Unit*** | ***%*** | ***Eq. Unit*** |
| Transfer to Process II | 30,000 | 100 | 30,000 | 100 | 30,000 |
| Closing WIP | 10,000 | 100 | 10,000 | 50 | 5,000 |
| ***Total*** | ***40,000*** | - | ***40,000*** | - | ***35,000*** |

***Statement of Cost (Process I)***

| ***Elements*** | ***Cost*** | ***Equivalent Units*** | ***Cost Per Unit*** |
|---|---|---|---|
| Direct Materials | 6,00,000 | 40,000 | 15.00 |
| Direct Wages | 7,00,000 | 35,000 | 20.00 |
| Factory Overheads | 4,90,000 | 35,000 | 14.00 |
| Total cost per unit | | | 49.00 |

***Statement of Apportionment of Cost (Process I)***

| ***Particulars*** | ***Elements*** | ***Eq. Units*** | ***Cost Per Unit*** | ***Total*** |
|---|---|---|---|---|
| Transfer to Process II | Materials, Labour, Overhead | 30,000 | 49.00 | ***14,70,000*** |
| Closing WIP | Materials | 10,000 | 15.00 | 1,50,000 |
| | Labour, Overhead | 5,000 | 20.00 + 14.00 | 1,70,000 |
| | | | | ***3,20,000*** |

***Process I Account***

| ***Particulars*** | ***Units*** | ***₹*** | ***Particulars*** | ***Units*** | ***₹*** |
|---|---|---|---|---|---|
| To Direct Materials | 40,000 | 6,00,000 | By Process II A/c | 30,000 | 14,70,000 |
| To Direct Labour | | 7,00,000 | By Closing WIP | 10,000 | 3,20,000 |
| To Overhead | | 4,90,000 | | | |
| | ***40,000*** | ***17,90,000*** | | ***40,000*** | ***17,90,000*** |

**Statement of Equivalent Production (Process II)**

| Particulars | Units | Materials | | Labour & Overhead | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Normal Loss | 200 | - | - | - | - |
| Units Completed | 28,000 | 100 | 28,000 | 100 | 28,000 |
| Closing WIP | 1,800 | 100 | 1,800 | 25 | 450 |
| **Total** | **30,000** | **-** | **29,800** | **-** | **28,450** |

**Statement of Cost (Process II)**

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Direct Materials | 14,70,000 | 29,800 | 49.3289 |
| Direct Wages | 1,42,250 | 28,450 | 5.0000 |
| Factory Overheads | 1,70,700 | 28,450 | 6.0000 |
| | | | **60.3289** |

**Statement of Apportionment of Cost (Process II)**

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Completed | All | 28,000 | 60.3289 | 16,89,209 |
| Add: Packing Expenses | | | | 1,60,000 |
| (Only at completed units) | | | | **18,49,209** |
| Closing WIP | Materials | 1,800 | 49.3289 | 88,791 |
| | Labour, Overhead | 450 | 5 + 6 | 4,950 |
| | | | | **93,741** |

**Process II Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process I A/c | 30,000 | 14,70,000 | By Normal loss | 200 | - |
| To Direct Labour | | 1,42,250 | By Finished Stock | 28,000 | 18,49,209 |
| To Overhead | | 1,70,700 | By Closing WIP | 1,800 | 93,741 |
| To Packing Materials | | 1,60,000 | | | |
| | **30,000** | **19,42,950** | | **30,000** | **19,42,950** |

## EQUIVALENT PRODUCTION (OPENING AND CLOSING WIP)

### BQ 21

Hill manufacturing Ltd uses process costing to manufacture Water density sensors for hydro sector. The following information pertains to operations for the month of May.

| Particulars | Units |
|---|---|
| Beginning WIP, May 1 | 16,000 |
| Started in production during May | 1,00,000 |
| Completed production during May | 92,000 |
| Ending work in progress, May 31 | 24,000 |

The beginning work in progress was 60% complete for materials and 20% complete for conversion costs. The ending inventory was 90% complete for material and 40% complete for conversion costs.

Costs pertaining to the month of May are as follows:

Beginning inventory costs are material ₹27,670, direct labour ₹30,120 and factory overhead ₹12,720. Cost incurred during May are material used, ₹4,79,000, direct labour ₹1,82,880, factory overheads ₹3,91,160.

**Calculate:**

**(a)** Using the FIFO method, the equivalent units of production for material.
**(b)** Cost per equivalent unit for conversion cost.

**Answer**

**(a) Statement of Equivalent Production**

| Particulars | Units | Materials | | Conversion cost | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Opening units: | | | | | |
| Used for Completed Units | 16,000 | 40% | 6,400 | 80% | 12,800 |
| Units Introduced: | | | | | |
| Used for Completed Units | 76,000 | 100 | 76,000 | 100 | 76,000 |
| Used for Closing WIP | 24,000 | 90 | 21,600 | 40 | 9,600 |
| **Total** | **1,16,000** | **-** | **1,04,000** | **-** | **98,400** |

**(b) Statement of Cost per Equivalent Unit for Conversion Cost**

| Elements | Amount (₹) | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Conversion Cost | 1,82,880 + 3,91,160 = 5,74,040 | 98,400 | ₹5.8337 |

**BQ 22**

X Ltd. a manufacturer of a specialized product, is having a process costing system. The stock of work-in-progress at the end of each month is valued on ***FIFO*** basis. At the beginning of a month, the stock of work-in-progress was 400 units (40 per cent complete) which was valued as follows:

| | |
|---|---|
| Materials | ₹3,600 |
| Labour | ₹3,400 |
| Overheads | ₹1,000 |
| **Total** | **₹8,000** |

During the month, actual issue of materials for production purpose was ₹68,500. Wages and overheads in the month amounted to ₹79,800 and ₹21,280 respectively. Finished production taken into the stock in the month was 2,500 units. There was no loss in the process. At the end of the month, the stock of work-in-progress was 500 units (60 per cent complete as to labour and overheads and 80 per cent complete as to materials).

***Prepare a Process Cost Sheet showing total and unit costs.***

**Answer**

**Process Cost Sheet**

| Particulars | ₹ |
|---|---|
| Materials | 68,500 |
| Labour | 79,800 |
| **Prime Cost** | **1,48,300** |
| Overheads | 21,280 |
| ***Add:*** Opening WIP | 8,000 |
| ***Less:*** Closing WIP | (21,486) |
| **Cost of Production** | **1,56,094** |
| **Cost per Unit produced (1,56,094 ÷ 2,500 units)** | **₹62.4376** |

Units introduced during the month = Finished Units + Closing WIP - Opening WIP
= 2,500 + 500 – 400 = ***2,600 Units***

**Statement of Equivalent Production**

| Particulars | Units | Materials | | Labour & Overhead | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Opening units: | | | | | |
| Used for Completed Units | 400 | 60 | 240 | 60 | 240 |
| Units Introduced: | | | | | |
| Used for Completed Units | 2,100 | 100 | 2,100 | 100 | 2,100 |
| Used for Closing WIP | 500 | 80 | 400 | 60 | 300 |
| **Total** | **3,000** | **-** | **2,740** | **-** | **2,640** |

**Statement of Cost**

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 68,500 | 2,740 | 25.00 |
| Labour | 79,800 | 2,640 | 30.227 |
| Overheads | 21,280 | 2,640 | 8.061 |
| Total cost per unit | | | 63.288 |

**Statement of Apportionment of Cost**

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Completed: | | | | |
| Current Period Cost | All | 2,340 (2,100 + 240) | 63.288 | 1,48,094 |
| *Add:* Cost of Opening WIP (Used in completed units) | | | | 8,000 |
| | | | | **1,56,094** |
| Closing WIP | Materials | 400 | 25 | 10,000 |
| | Labour & OH | 300 | 30.227 + 8.061 | 11,486 |
| | | | | **21,486** |

## BQ 23

The following data are available in respect of process 1 for March 2023:

1. Opening stock of work in process 800 units at a total cost of ₹4,000.
2. Degree of completion of opening work in progress:

| | |
|---|---|
| Materials | 100% |
| Labour | 60% |
| Overheads | 60% |

3. Input of materials at a total cost of ₹36,800 for 9,200 units.
4. Direct wages incurred ₹16,740
5. Production overhead ₹8,370
6. Unit scrapped 1,200 units. The state of completion of these units was:

| | |
|---|---|
| Materials | 100% |
| Labour | 80% |
| Overheads | 80% |

7. Closing work in progress 900 units. The stage of completion of these units was:

| | |
|---|---|
| Materials | 100% |
| Labour | 70% |
| Overheads | 70% |

8. 7,900 units were completed and transferred to the next process.
9. Normal loss is 8% of the total input.
10. Scrap value is ₹4 per unit.

**You are required to:**

(A) Compute equivalent production.
(B) Calculate the cost per equivalent unit for each element.
(C) Calculate the value of abnormal loss (or gain) closing work in progress and the units transferred to the next process by using ***FIFO Method***.
(D) Show the process account for March 2023.

## Answer

**(A) Statement of Equivalent Production**

| Particulars | Units | Materials | | Labour & Overhead | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Opening units: | | | | | |
| Used for Completed Units | 800 | - | - | 40 | 320 |
| Units Introduced: | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Used for Completed Units | 7,100 | 100 | 7,100 | 100 | 7,100 |
| Used for Closing WIP | 900 | 100 | 900 | 70 | 630 |
| Normal Loss | 800 | - | - | - | - |
| Abnormal Loss | 400 | 100 | 400 | 80 | 320 |
| ***Total*** | ***10,000*** | - | ***8,400*** | - | ***8,370*** |

### *(B) Statement of Cost*

| *Elements* | *Cost* | *Equivalent Units* | *Cost Per Unit* |
|---|---|---|---|
| Materials | 36,800 – 3,200 = 33,600 | 8,400 | ₹4.00 |
| Labour | 16,740 | 8,370 | ₹2.00 |
| Overheads | 8,370 | 8,370 | ₹1.00 |
| Total cost per unit | | | ₹7.00 |

### *(C) Statement of Valuation of Abnormal Loss, Closing WIP, and Units Transferred to Next Process*

| *Particulars* | *Elements* | *Eq. Units* | *Cost per unit* | *Total* |
|---|---|---|---|---|
| Units Transferred: | | | | |
| Current Period Cost | Materials | 7,100 | 4.00 | 28,400 |
| | Labour, OH | 7,420 | 2.00 + 1.00 | 22,680 |
| ***Add:*** Cost of Opening WIP (Used in completed units) | | | | 4,000 |
| | | | | ***54,660*** |
| Closing WIP | Materials | 900 | 4.00 | 3,600 |
| | Labour, OH | 630 | 2.00 + 1.00 | 1,890 |
| | | | | ***5,490*** |
| | Materials | 400 | 4.00 | 1,600 |
| Abnormal Loss | Labour, OH | 320 | 2.00 + 1.00 | 960 |
| | | | | ***2,560*** |

### *(D) Process Account For March 2023*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Opening WIP | 800 | 4,000 | By Normal loss | 800 | 3,200 |
| To Materials | 9,200 | 36,800 | By Abnormal Loss | 400 | 2,560 |
| To Labour | | 16,740 | By Next Process A/c | 7,900 | 54,660 |
| To Overhead | | 8,370 | By Closing WIP | 900 | 5,490 |
| | ***10,000*** | ***65,910*** | | ***10,000*** | ***65,910*** |

### *BQ 24*

The following data pertains to process for March, 2023 of Beta Ltd.

| | | |
|---|---|---|
| Opening work in progress | | 1,500 units at ₹15,000 |
| Degree of completion: | Material | 100%, |
| | Labour and overhead | 33-⅓ |
| Input of materials | | 18,500 units at ₹52,000 |
| Direct labour | | ₹14,000 |
| Overheads | | ₹28,000 |
| Closing work in progress | | 5,000 units |
| Degree of completion: | Materials | 90% |
| | Labour and overhead | 30% |
| Normal progress loss | | 10% of total Input |
| Scrap value | | ₹2.00 per unit |
| Unit transferred to the next process | | 15,000 units |

***You are required to:***

***(a)*** Compute equivalent units of production using ***FIFO Method.***

***(b)*** Compute cost per equivalent units for each cost element i.e. material labour and overheads.

***(c)*** Compute the cost of finished output, closing work in progress and abnormal gain.

***(d)*** Prepare the process and other accounts.

## Answer

### (a) Statement of Equivalent Production

| Particulars | Units | Materials | | Labour & Overhead | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Opening units: | | | | | |
| Used for Completed Units | 1,500 | - | - | 66-⅔ | 1,000 |
| Units Introduced: | | | | | |
| Used for Completed Units | 13,500 | 100 | 13,500 | 100 | 13,500 |
| Used for Closing WIP | 5,000 | 90 | 4,500 | 30 | 1,500 |
| Normal Loss | 2,000 | - | - | - | - |
| **Total** | **22,000** | **-** | **18,000** | **-** | **16,000** |
| Less: Abnormal Gain | (2,000) | 100 | (2,000) | 100 | (2,000) |
| **Net Total** | **20,000** | **-** | **16,000** | **-** | **14,000** |

### (b) Statement of Cost

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 52,000 – 4,000 = 48,000 | 16,000 | ₹3.00 |
| Labour | 14,000 | 14,000 | ₹1.00 |
| Overheads | 28,000 | 14,000 | ₹2.00 |
| Total cost per unit | | | ₹6.00 |

### (c) Statement of Evaluation

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Transferred: | | | | |
| Current Period Cost | Materials | 13,500 | 3.00 | 40,500 |
| | Labour, Overhead | 14,500 | 1.00 + 2.00 | 43,500 |
| Add: Cost of Opening WIP | | | | 15,000 |
| | | | | **99,000** |
| Closing WIP | Materials | 4,500 | 3.00 | 13,500 |
| | Labour, Overhead | 1,500 | 1.00 + 2.00 | 4,500 |
| | | | | **18,000** |
| Abnormal Gain | All | 2,000 | 6.00 | **12,000** |

### (d) Process Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Opening WIP | 1,500 | 15,000 | By Normal loss | 2,000 | 4,000 |
| To Input of Materials | 18,500 | 52,000 | By Next Process A/c | 15,000 | 99,000 |
| To Direct Labour | | 14,000 | By Closing WIP | 5,000 | 18,000 |
| To Overhead | | 28,000 | | | |
| To Abnormal Gain | 2,000 | 12,000 | | | |
| | **22,000** | **1,21,000** | | **22,000** | **1,21,000** |

## BQ 25

The following details are given in respect of a manufacturing unit for the month of April 2023.

| | |
|---|---|
| Opening work-in-progress 5000 units: | |
| Materials (100% complete) | ₹18,750 |
| Labour (60% complete) | ₹7,500 |
| Overheads (60% complete) | ₹3,750 |
| Units introduced into process | 17,500 units |
| Transferred to the next process | 17,500 units |
| Process cost for the period are: | |
| Material | ₹2,50,000 |
| Labour | ₹1,95,000 |
| Overheads | ₹97,500 |

The stage of completion of units in closing WIP:

| | |
|---|---|
| Material | 100% |
| Labour and Overheads | 50% |

***You are required to prepare a statement of equivalent units of production, statement of cost also find the value of:***

***(i)*** Output transferred and

***(ii)*** Closing work in progress, using ***Weighted average cost method.***

***[Output Transferred 17,500 units, Value ₹4,74,809; Closing WIP 5,000 units, Value ₹97,691]***

## BQ 26

| | |
|---|---|
| Opening Work-in-progress | 2,000 units |
| Materials (100% complete) | ₹7,500 |
| Labour (60% complete) | ₹3,000 |
| Overhead (60% complete) | ₹1,500 |
| Units introduced into this process | 8,000 units |
| Closing Work-in-progress | 2,000 units |
| Stage of completion is estimated to be: | |
| Material | 100% |
| Labour | 50% |
| Overhead | 50% |
| Transferred to next process | 8,000 units |
| The process costs for the period are: | |
| Materials | ₹1,00,000 |
| Labour | ₹78,000 |
| Overheads | ₹39,000 |

***From the following details prepare:***

***(a)*** Statement of Equivalent Production,

***(b)*** Statement of Cost and

***(c)*** Statement of Apportionment of Cost as per ***Weighted Average Cost*** basis.

## Answer

### (a) Statement of Equivalent Production

| Particulars | Units | Materials | | Labour & Overhead | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Units Transferred | 8,000 | 100 | 8,000 | 100 | 8,000 |
| Closing WIP | 2,000 | 100 | 2,000 | 50 | 1,000 |
| ***Total*** | ***10,000*** | - | ***10,000*** | - | ***9,000*** |

### (b) Statement of Cost

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 7,500 + 1,00,000 = 1,07,500 | 10,000 | ₹10.75 |
| Labour | 3,000 + 78,000 = 81,000 | 9,000 | ₹9.00 |
| Overheads | 1,500 + 39,000 = 40,500 | 9,000 | ₹4.50 |
| Total cost per unit | | | ₹24.25 |

### (c) Statement of Apportionment of Cost

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units transferred | All | 8,000 | 24.25 | ***1,94,000*** |
| Closing WIP | Materials | 2,000 | 10.75 | 21,500 |
| | Labour & Overhead | 1,000 | 9.00 + 4.50 | 13,500 |
| | | | | ***35,000*** |

**BQ 27**

| | |
|---|---|
| Cost of opening work-in-process (1,000 units 60% complete) | ₹1,10,000 |
| Cost of units introduced during the period (10,000 units) | ₹19,30,000 |
| Transferred to next process | 9,000 units |
| Closing work-in-process (75% complete) | 800 units |
| Normal loss | 10% of total input |
| Scraps realise | ₹10 per unit |
| Scraps | 100% complete |

***Compute equivalent production and cost per equivalent unit and also evaluate the Output, Closing WIP and Abnormal loss using (1) FIFO method and (2) Weighted average method.***

***Answer***

***(1) FIFO Method:***

***(a) Statement of Equivalent Production***

| Particulars | Units | Total Cost | |
|---|---|---|---|
| | | % | Eq. Unit |
| Opening units: | | | |
| Used for Units transferred | 1,000 | 40 | 400 |
| Units Introduced: | | | |
| Used for Units transferred | 8,000 | 100 | 8,000 |
| Used for Closing WIP | 800 | 75 | 600 |
| Normal Loss | 1,100 | - | - |
| Abnormal Loss | 100 | 100 | 100 |
| | ***11,000*** | - | ***9,100*** |

***(b) Statement of Cost***

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Total Current period Cost | 19,30,000 – 1,100 × 10 = 19,19,000 | 9,100 | ₹210.8791 |

***(c) Statement of Evaluation***

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Transferred: | | | | |
| Current Period Cost | All | 8,400 | 210.8791 | 17,71,384 |
| Add: Cost of Opening WIP | | | | 1,10,000 |
| | | | | ***18,81,384*** |
| Closing WIP | All | 600 | 210.8791 | ***1,26,528*** |
| Abnormal Loss | All | 100 | 210.8791 | ***21,088*** |

***(2) Weighted Average Method:***

***(a) Statement of Equivalent Production***

| Particulars | Units | Total Cost | |
|---|---|---|---|
| | | % | Eq. Unit |
| Normal Loss | 1,100 | - | - |
| Abnormal Loss | 100 | 100 | 100 |
| Units transferred | 9,000 | 100 | 9,000 |
| Closing WIP | 800 | 75 | 600 |
| | ***11,000*** | - | ***9,700*** |

***(b) Statement of Cost***

| Elements | Cost (Current + Opening WIP) | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Total Cost | 19,30,000 + 1,10,000 – 1,100 × 10 = 20,29,000 | 9,700 | ₹209.1752 |

### (c) Statement of Evaluation

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Transferred | All | 9,000 | 209.1752 | **18,82,577** |
| Closing WIP | All | 600 | 209.1752 | **1,25,505** |
| Abnormal Loss | All | 100 | 209.1752 | **20,918** |

## BQ 28

'Healthy Sweets' is engaged in the manufacturing of jaggery. Its process involve sugarcane crushing for juice extraction, then filtration and boiling of juice along with some chemicals and then letting it cool to cut solidified jaggery blocks.

The main process of juice extraction (Process I) is done in conventional crusher, which is then filtered and boiled (Process II) in iron pots. The solidified jaggery blocks are then cut, packed and dispatched. For manufacturing 10 kg of jaggery, 100 kg of sugarcane is required, which extracts only 45 litre of juice.

***Following information regarding Process –I has been obtained from the manufacturing department of Healthy Sweets for the month of January, 2023:***

| | | |
|---|---|---|
| Opening work-in process (4,500 litre) | | |
| | Sugarcane | ₹50,000 |
| | Labour | ₹15,000 |
| | Overheads | ₹45,000 |
| Sugarcane introduced for juice extraction (1,00,000 kg) | | ₹5,00,000 |
| Direct Labour | | ₹2,00,000 |
| Overheads | | ₹6,00,000 |
| Abnormal Loss | | 1,000 kg |
| Degree of completion: | | |
| | Sugarcane | 100% |
| | Labour and overheads | 80% |
| Closing work-in process | | 9,000 litre |
| Degree of completion: | | |
| | Sugarcane | 100% |
| | Labour and overheads | 80% |
| Extracted juice transferred for filtering and boiling<br>(Consider mass of 1 litre of juice equivalent to 1 kg) | | 39,500 litre |

***You are required to prepare using average method:***

1. Statement of equivalent production,
2. Statement of cost,
3. Statement of distribution cost, and
4. Process I Account.

## Answer

### 1. Statement of Equivalent Production (Average Cost Method)

| Particulars | Total Units | Materials | | Labour & OH | |
|---|---|---|---|---|---|
| | | % | Unit | % | Unit |
| Units Completed | 39,500 | 100 | 39,500 | 100 | 39,500 |
| Normal loss | 55,000 | - | - | - | - |
| Abnormal Loss | 1,000 | 100 | 1,000 | 80 | 800 |
| Closing WIP | 9,000 | 100 | 9,000 | 80 | 7,200 |
| **Total** | **1,04,500** | **-** | **49,500** | **-** | **47,500** |

### 2. Statement of Cost

| Elements | Total Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 50,000 + 5,00,000 = 5,50,000 | 49,500 | 11.111 |
| Labour | 15,000 + 2,00,000 = 2,15,000 | 47,500 | 4.526 |
| Overheads | 45,000 + 6,00,000 = 6,45,000 | 47,500 | 13.579 |
| | | | **29.216** |

### 3. Statement of Distribution of Cost

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Completed | All | 39,500 | 29.216 | **11,54,032** |
| Abnormal Loss | Materials | 1,000 | 11.111 | 11,111 |
| | Labour, Overheads | 800 | 4.526 + 13.579 | 14,484 |
| | | | | **25,595 + 18** |
| Closing WIP | Materials | 9,000 | 11.111 | 99,999 |
| | Labour, Overheads | 7,200 | 4.526 + 13.579 | 1,30,356 |
| | | | | **2,30,355** |

### 4. Process I Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Opening WIP | 4,500 | 1,10,000 | By Normal Loss @55% of 1,00,000 kgs. | 55,000 | - |
| To Sugarcane introduced | 1,00,000 | 5,00,000 | By Process II A/c | 39,500 | 11,54,032 |
| To Direct Labour | | 2,00,000 | By Abnormal Loss A/c | 1,000 | 25,613 |
| To Overhead | | 6,00,000 | By Closing WIP | 9,000 | 2,30,355 |
| | **1,04,500** | **14,10,000** | | **1,04,500** | **14,10,000** |

## REVERSE CALCULATION

### BQ 29

Star Ltd. manufactures chemical solutions for the food processing industry. The manufacturing takes place in a number of processes uses FIFO method to value WIP and Finished goods. At the end of the month of last month, a fire occurred in the factory and some papers containing records of the process operations for the month were destroyed.

Star Ltd. needs your help to prepare process account for the month during which the fire occurred. You have been able to gather some information about the month's operating activities but some of the information could not be retrieved due to the damage. The following information was salvaged:

- Opening work-in process at the beginning of the month of 1,600 litres, 70% complete for labour and 60% for overheads. Opening WIP was valued at ₹1,06,560.
- Closing WIP at the end of the month was 320 litres, 30% complete for labour and 20% for overheads.
- Normal loss is 10% of input and total losses during the month were 1,200 litres partly due to fire damage.
- Output sent to finished goods warehouse was 8,400 litres.
- Losses have a scrap value of ₹15 per litre.
- All raw materials are added at the commencement of the process.
- The cost per equivalent unit (litre) is ₹78 for the month consisting:

| | |
|---|---|
| Raw materials | ₹46 |
| Labour | ₹14 |
| Overheads | ₹18 |
| Total | **₹78** |

***You are required to:***

**(1)** Calculate the quantity (in litres) of raw materials input during the month.
**(2)** Calculate the quantity (in litres) of normal loss and abnormal loss/gain experienced in the month.
**(3)** Calculate the value of raw materials, labour and overheads added to the process during the month.
**(4)** Prepare process account for the month.

**Answer**

**(1) Calculation of quantity of raw materials input during the month:**

| | | | | |
|---|---|---|---|---|
| Raw materials input | = | Output of Finished goods + Closing WIP + Losses – Opening WIP | | |
| | = | 8,400 + 320 + 1,200 – 1,600 | = | **8,320 litres** |

**(2) Calculation of quantity of normal loss and abnormal loss or gain:**

| | | | | |
|---|---|---|---|---|
| Normal loss | = | 10% of Input = 10% of 8,320 | = | **832 litres** |
| Abnormal loss | = | Actual loss – Normal loss | | |
| | = | 1,200 – 832 | = | **368 litres** |

**(3) Statement of Material, Labour and Overheads added during the month**

| Particulars | Materials | Labour | Overheads |
|---|---|---|---|
| Cost per equivalent units | 46 | 14 | 18 |
| Number of equivalent units | 7,488 | 7,744 | 7,872 |
| Cost of equivalent units | 3,44,448 | 1,08,416 | 1,41,696 |
| Add: Scrap value of normal loss units (832 × 15) | 12,480 | - | - |
| **Total value added** | **3,56,928** | **1,08,416** | **1,41,696** |

**(4) Process A/c**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Opening WIP | 1,600 | 1,06,560 | By Normal Loss | 832 | 12,480 |
| To Materials | 8,320 | 3,56,928 | By Finished Output | 8,400 | 6,55,200 |
| To Labour | | 1,08,416 | By Abnormal Loss | 368 | 28,704 |
| To Overheads | | 1,41,696 | By WIP Closing | 320 | 17,216 |
| | **8,320** | **7,13,600** | | **8,320** | **7,13,600** |

**Working Note:**

**(a) Statement of Equivalent Production**

| Particulars | Units | Materials | | Labour | | Overheads | |
|---|---|---|---|---|---|---|---|
| | | % | E. Units | % | E. Units | % | E. Units |
| Opening Units: | | | | | | | |
| Used for Completed Units | 1,600 | - | - | 30 | 480 | 40 | 640 |
| Current Units: | | | | | | | |
| Used for Completed Units | 6,800 | 100 | 6,800 | 100 | 6,800 | 100 | 6,800 |
| Normal loss | 832 | - | - | - | - | - | - |
| Abnormal loss | 368 | 100 | 368 | 100 | 368 | 100 | 368 |
| Closing WIP | 320 | 100 | 320 | 30 | 96 | 20 | 64 |
| **Total** | **9,920** | **-** | **7,488** | **-** | **7,744** | **-** | **7,872** |

**(b) Statement of Evaluation**

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Completed: | | | | |
| Current period cost | Materials | 6,800 | 46 | 3,12,800 |
| | Labour | 7,280 | 14 | 1,01,920 |
| | Overheads | 7,440 | 18 | 1,33,920 |
| Add: Cost of Opening WIP | | | | 1,06,560 |
| | | | | **6,55,200** |
| Abnormal Loss | All | 368 | 78 | **28,704** |
| Closing WIP | Materials | 320 | 46 | 14,720 |
| | Labour | 96 | 14 | 1,344 |
| | Overheads | 64 | 18 | 1,152 |
| | | | | **17,216** |

# INTER PROCESS PROFIT

### BQ 30

A product passes through two Processes A and B to completion. Output of Process A is transferred to Process B at cost plus 20% and finished goods used similarly transferred to Finished Stock A/c at cost plus a profit of 20% on transfer price. On 31st December 2023 the following information is given to you:

| | Process A | Process B |
|---|---|---|
| Direct Materials | ₹10,000 | ₹30,000 |
| Direct Labour | ₹15,000 | ₹21,000 |
| Closing stock (value at prime cost) | ₹5,000 | ₹15,000 |

Out of the finished stock, stock valued at ₹30,000 was in hand and the rest was sold for ₹60,000. Prepare the Processes and Finished Stock Accounts. Show the amount of actual profit and closing stock also.

### Answer

**Process A A/c**

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Direct Materials | 10,000 | 10,000 | - | Process B A/c | 24,000 | 20,000 | 4,000 |
| Direct Labour | 15,000 | 15,000 | - | Closing Stock | 5,000 | 5,000 | - |
| Prime Cost | 25,000 | 25,000 | - | | | | |
| Profit | 4,000 | - | 4,000 | | | | |
| | **29,000** | **25,000** | **4,000** | | **29,000** | **25,000** | **4,000** |

**Process B A/c**

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Process A A/c | 24,000 | 20,000 | 4,000 | Finished Stock A/c | 75,000 | 56,800 | 18,200 |
| Direct Materials | 30,000 | 30,000 | - | | | | |
| Direct Labour | 21,000 | 21,000 | - | Closing Stock | 15,000 | 14,200 | *800 |
| Prime Cost | 75,000 | 71,000 | 4,000 | | | | |
| Profit | 15,000 | - | 15,000 | | | | |
| | **90,000** | **71,000** | **19,000** | | **90,000** | **71,000** | **19,000** |

**Finished Stock A/c**

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Process B A/c | 75,000 | 56,800 | 18,200 | Costing P&L A/c | 60,000 | 34,080 | 25,920 |
| Profit | 15,000 | - | 15,000 | Closing Stock | 30,000 | 22,720 | *7,280 |
| | **90,000** | **56,800** | **33,200** | | **90,000** | **56,800** | **33,200** |

**** Stock reserve in closing stock of Process B*** = $^{4,000}/_{75,000} \times 15,000$ = ***800***

**** Stock reserve in closing stock of FG*** = $^{18,200}/_{75,000} \times 30,000$ = ***7,280***

### BQ 31

A product passes through two Processes A and B. Output of A is transferred to Process B at cost plus 25% profit and finished output is similarly transferred to Finished Stock Account at cost plus 25% profit. There was no work-in-progress in either process on 31st December. On this date, the following further information was available:

| | Process A | Process B |
|---|---|---|
| Direct Materials | ₹8,000 | ₹24,000 |
| Direct Labour | ₹12,000 | ₹16,000 |
| Closing stock (value at prime cost) | ₹4,000 | ₹12,000 |

Out of the finished work a product remained at hand valued at ₹18,000 and the balance was sold for ₹58,000. Prepare the process and Finished Stock Account. Question of overhead should be ignored and assume that there was no opening stock. Find out reserve for unrealized profit.

## Answer

### Process A A/c

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Direct Materials | 8,000 | 8,000 | - | Process B A/c | 20,000 | 16,000 | 4,000 |
| Direct Labour | 12,000 | 12,000 | - | Closing Stock | 4,000 | 4,000 | - |
| Prime Cost | 20,000 | 20,000 | - | | | | |
| Profit | 4,000 | - | 4,000 | | | | |
| | **24,000** | **20,000** | **4,000** | | **24,000** | **20,000** | **4,000** |

### Process B A/c

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Process A A/c | 20,000 | 16,000 | 4,000 | Finished Stock A/c | 60,000 | 44,800 | 15,200 |
| Direct Materials | 24,000 | 24,000 | - | | | | |
| Direct Labour | 16,000 | 16,000 | - | Closing Stock | 12,000 | 11,200 | *800 |
| Prime Cost | 60,000 | 56,000 | 4,000 | | | | |
| Profit | 12,000 | - | 12,000 | | | | |
| | **72,000** | **56,000** | **16,000** | | **72,000** | **56,000** | **16,000** |

### Finished Stock A/c

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Process B A/c | 60,000 | 44,800 | 15,200 | Costing P&L A/c | 58,000 | 31,360 | 26,640 |
| Profit | 16,000 | - | 16,000 | Closing Stock | 18,000 | 13,440 | *4,560 |
| | **58,000** | **31,360** | **26,640** | | **76,000** | **44,800** | **31,200** |

**** Stock reserve in closing stock of Process B*** = ${}^{4,000}/_{60,000} \times 12,000$ = **800**

**** Stock reserve in closing stock of FG*** = ${}^{15,200}/_{60,000} \times 18,000$ = **4,560**

## BQ 32

A Ltd. produces product AXE which passes through two processes before it is completed and transferred to finished stock. The following data relate to October 2023.

| | Process I | Process II | Finished Stock |
|---|---|---|---|
| Opening stock | 7,500 | 9,000 | 22,500 |
| Direct materials | 15,000 | 15,750 | |
| Direct wages | 11,200 | 11,250 | |
| Factory overheads | 10,500 | 4,500 | |
| Closing stock | 3,700 | 4,500 | 11,250 |
| Inter - process profit included in opening stock | Nil | 1,500 | 8,250 |

Output of process I is transferred to Process II at 25% profit on the transfer price. Output of Process II is transferred to finished stock at 20% profit on the transfer price. Stock in process is valued at prime cost. Finished stock is valued at the price at which it is received from process II. Sales during the period are ₹1,40,000. Prepare Process accounts and finished goods account showing the profit element at each stage.

## Answer

### Process I A/c

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Opening Stock | 7,500 | 7,500 | - | Process II A/c | 54,000 | 40,500 | 13,500 |
| Direct Materials | 15,000 | 15,000 | - | Closing Stock | 3,700 | 3,700 | - |
| Direct Wages | 11,200 | 11,200 | - | | | | |
| Prime Cost | 33,700 | 33,700 | - | | | | |
| Factory OH | 10,500 | 10,500 | - | | | | |
| Total Cost | 44,200 | 44,200 | - | | | | |
| Profit | 13,500 | - | 13,500 | | | | |
| | **57,700** | **44,200** | **13,500** | | **57,700** | **44,200** | **13,500** |

### *Process II A/c*

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Opening Stock | 9,000 | 7,500 | 1,500 | Finished Stock A/c | 1,12,500 | 75,750 | 36,750 |
| Process II A/C | 54,000 | 40,500 | 13,500 | | | | |
| Direct Materials | 15,750 | 15,750 | - | Closing Stock | 4,500 | 3,750 | *750 |
| Direct Wages | 11,250 | 11,250 | - | | | | |
| Prime Cost | 90,000 | 75,000 | 15,000 | | | | |
| Factory OH | 4,500 | 4,500 | - | | | | |
| Total Cost | 94,500 | 79,500 | 15,000 | | | | |
| Profit | 22,500 | - | 22,500 | | | | |
| | ***1,17,000*** | ***79,500*** | ***37,500*** | | ***1,17,000*** | ***79,500*** | ***37,500*** |

### *Finished Stock A/c*

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Opening Stock | 22,500 | 14,250 | 8,250 | Costing P&L A/c | 1,40,000 | 82,425 | 57,575 |
| Process II A/c | 1,12,500 | 75,750 | 36,750 | Closing Stock | 11,250 | 7,575 | *3,675 |
| Profit | 16,250 | - | 16,250 | | | | |
| | ***1,51,250*** | ***90,000*** | ***61,250*** | | ***1,51,250*** | ***90,000*** | ***61,250*** |

**** Stock reserve in closing stock of Process II*** = $^{15,000}/_{90,000} \times 4,500$ = ***750***

**** Stock reserve in closing stock of FG*** = $^{36,750}/_{1,12,500} \times 11,250$ = ***3,675***

# PAST YEAR QUESTIONS

***PYQ 1***
***The following data relate to process Q:***

| | | | |
|---|---|---|---|
| **(a)** | Opening work-in-process | | 4,000 units |
| | *Degree of completion:* | | |
| | Materials | 100% | ₹24,000 |
| | Labour | 60% | ₹14,400 |
| | Overheads | 60% | ₹7,200 |
| **(b)** | Received during the month of April, 1998 from process P | 40,000 units | ₹1,71,000 |
| **(c)** | Expenses incurred in process Q during the months: | | |
| | Materials | | ₹79,000 |
| | Labour | | ₹1,38,230 |
| | Overheads | | ₹69,120 |
| **(d)** | Closing work-in-process | | 3,000 units |
| | *Degree of completion:* | | |
| | Materials | 100% | |
| | Labour & Overheads | 50% | |
| **(e)** | Units scrapped | | 4,000 units |
| | *Degree of completion:* | | |
| | Materials | 100% | |
| | Labour & Overheads | 80% | |
| **(f)** | Normal loss | | 5% of current input |
| **(g)** | Spoiled goods realized ₹1.50 each on sale. | | |
| **(h)** | Completed units are transferred to warehouse. | | |

***You are required to prepare:***

**(A)** Equivalent units statement.
**(B)** Statement of cost per equivalent unit for each cost element i.e., material, labour and overheads and total costs.
**(C)** Process Q Account.
**(D)** Any other necessary account.

***Assume:***

**1.** FIFO method is used by the company.
**2.** The cost of opening WIP is fully transferred to next process.

***[(12 Marks) May 1998]***

## *Answer*

***(A) Statement of Equivalent Production***

| Particulars | Units | Materials | | Labour & Overhead | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Opening units: | | | | | |
| Used for Completed Units | 4,000 | - | - | 40 | 1,600 |
| Units Introduced: | | | | | |
| Used for Completed Units | 33,000 | 100 | 33,000 | 100 | 33,000 |
| Used for Closing WIP | 3,000 | 100 | 3,000 | 50 | 1,500 |
| Normal Loss | 2,000 | - | - | - | - |
| Abnormal Loss | 2,000 | 100 | 2,000 | 80 | 1,600 |
| ***Total*** | ***44,000*** | ***-*** | ***38,000*** | ***-*** | ***37,700*** |

### (B) Statement of Cost

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 1,71,000 + 79,000 – 3,000 = 2,47,000 | 38,000 | 6.50 |
| Labour | 1,38,230 | 37,700 | 3.67 |
| Overheads | 69,120 | 37,700 | 1.83 |
| Total cost per unit | | | 12.00 |

### (C) Process Q Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Opening WIP | 4,000 | 45,600 | By Normal loss | 2,000 | 3,000 |
| To Process P A/c | 40,000 | 1,71,000 | By Abnormal Loss | 2,000 | 21,800 |
| To Materials | | 79,000 | By Next Process A/c | 37,000 | 4,50,400 |
| To Labour | | 1,38,230 | By Closing WIP | 3,000 | 27,750 |
| To Overhead | | 69,120 | | | |
| | **44,000** | **5,02,950** | | **44,000** | **5,02,950** |

### (D) Statement of Evaluation

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Transferred: | | | | |
| Current Period Cost | Materials | 33,000 | 6.50 | 2,14,500 |
| | Labour, Overhead | 34,600 (33,000 + 1,600) | 5.50 | 1,90,300 |
| Add: Cost of Opening WIP | | | | 45,600 |
| (Used in completed units) | | | | **4,50,400** |
| Closing WIP | Materials | 3,000 | 6.50 | 19,500 |
| | Labour, Overhead | 1,500 | 5.50 | 8,250 |
| | | | | **27,750** |
| Abnormal Loss | Materials | 2,000 | 6.50 | 13,000 |
| | Labour, Overhead | 1,600 | 5.50 | 8,800 |
| | | | | **21,800** |

### Abnormal Loss A/c

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process Q A/c | 2,000 | 21,800 | By Cash A/c | 2,000 | 3,000 |
| | | | By Profit and Loss A/c | | 18,800 |
| | **2,000** | **21,800** | | **260** | **21,800** |

### PYQ 2

Following information is available regarding Process A for the month of February' 1999:

**Production Records:**

| | |
|---|---|
| Units in process as on 01.02.1999 | 4,000 |
| (All materials used, 25% complete for labour and overhead) | |
| New units introduced | 16,000 |
| Units completed | 14,000 |
| Units in process as on 28.02.1999 | 6,000 |
| (All materials used, 33-⅓% complete for labour and overhead) | |

**Cost Records:**

**Work-in-process as on 01.02.1999**

| | |
|---|---|
| Materials | ₹6,000 |
| Labour | ₹1,000 |
| Overhead | ₹1,000 |
| **Total** | **₹8,000** |

***Cost during the month***

| | |
|---|---|
| Materials | ₹25,600 |
| Labour | ₹15,000 |
| Overhead | ₹15,000 |
| ***Total*** | ***₹55,600*** |

***Presuming that average method of inventory is used, prepare:***

***(i)*** Statement of equivalent production.
***(ii)*** Statement showing cost for each element.
***(iii)*** Statement of apportionment of cost.
***(iv)*** Process cost account for Process A.

***[(12 Marks) May 1999]***

***Answer***

***Statement of Equivalent Production***

| ***Particulars*** | ***Units*** | ***Materials*** | | ***Labour & Overhead*** | |
|---|---|---|---|---|---|
| | | ***%*** | ***Eq. Unit*** | ***%*** | ***Eq. Unit*** |
| Units Completed | 14,000 | 100 | 14,000 | 100 | 14,000 |
| Closing WIP | 6,000 | 100 | 6,000 | 33-⅓ | 2,000 |
| ***Total*** | ***20,000*** | - | ***20,000*** | - | ***16,000*** |

***Statement of Cost***

| ***Elements*** | ***Total Cost*** | ***Equivalent Units*** | ***Cost Per Unit*** |
|---|---|---|---|
| Materials | 6,000 + 25,600 = 31,600 | 20,000 | 1.58 |
| Labour | 1,000 + 15,000 = 16,000 | 16,000 | 1.00 |
| Overheads | 1,000 + 15,000 = 16,000 | 16,000 | 1.00 |
| | | | ***3.58*** |

***Statement of Apportionment of Cost***

| ***Particulars*** | ***Elements*** | ***Eq. Units*** | ***Cost Per Unit*** | ***Total*** |
|---|---|---|---|---|
| Units Completed | Materials, Labour, Overhead | 14,000 | 3.58 | ***50,120*** |
| Closing WIP | Materials | 6,000 | 1.58 | 9,480 |
| | Labour, Overhead | 2,000 | 1.00 + 1.00 | 4,000 |
| | | | | ***13,480*** |

***Process Account***

| ***Particulars*** | ***Units*** | ***₹*** | ***Particulars*** | ***Units*** | ***₹*** |
|---|---|---|---|---|---|
| To Opening WIP | 4,000 | 8,000 | By Completed Units | 14,000 | 50,120 |
| To Materials | 16,000 | 25,600 | By Closing WIP | 6,000 | 13,480 |
| To Labour | | 15,000 | | | |
| To Overhead | | 15,000 | | | |
| | ***20,000*** | ***63,600*** | | ***20,000*** | ***63,600*** |

***PYQ 3***

The following information is given in respect of Process No 3 for the month of January, 2001.

***(a)*** ***Opening stock*** ***2,000 units***

| | | | |
|---|---|---|---|
| Direct materials I | ₹12,350 | Direct Materials II | ₹13,200 |
| Direct Labour | ₹17,500 | Overheads | ₹11,000 |

***(b)*** Transferred from Process No 2 — 20,000 units @ ₹6/unit
***(c)*** Transferred to Process No 4 — 17,000 units

***(d)*** ***Expenditure incurred in process No 3:***

| | |
|---|---|
| Direct Materials | ₹30,000 |
| Direct Labour | ₹60,000 |

| | | | | | |
|---|---|---|---|---|---|
| | Overheads | | | | ₹60,000 |
| *(e)* | Scrap | | | | 1,000 units |
| | | Direct Materials | 100% | Direct Labour | 60% |
| | | Overheads | 40% | | |
| *(f)* | Normal Loss | | | | 10% of production |
| *(g)* | Scrapped units realized | | | | ₹4 per units |
| *(h)* | *Closing Stock* | | | | *4,000 units* |
| | | Direct Materials | 80% | Direct Labour | 60% |
| | | Overheads | 40% | | |

***Prepare Process No 3 Account using average price method, along with necessary supporting statements.***

***[(10 Marks) May 2001]***

## *Answer*

### *Process Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Opening WIP | 2,000 | 54,050 | By Normal Loss | 1,800 | 7,200 |
| To Process 2 A/c | 20,000 | 1,20,000 | By Process 4 A/c | 17,000 | 2,81,822 |
| To Direct Materials II | | 30,000 | By Closing WIP | 4,000 | 48,290 |
| To Direct Labour | | 60,000 | | | |
| To Overhead | | 60,000 | | | |
| To Abnormal Gain | 800 | 13,262 | | | |
| | ***22,800*** | ***3,37,312*** | | ***22,800*** | ***3,37,312*** |

***WN:***

### *Statement of Equivalent Production (Average Cost Method)*

| *Particulars* | *Total Units* | *Materials I* | | *Materials II* | | *Labour* | | *Overhead* | |
|---|---|---|---|---|---|---|---|---|---|
| | | *%* | *Unit* | *%* | *Unit* | *%* | *Unit* | *%* | *Unit* |
| Units Transferred | 17,000 | 100 | 17000 | 100 | 17,000 | 100 | 17,000 | 100 | 17,000 |
| Normal loss | 1,800 | - | - | - | - | - | - | - | - |
| Closing WIP | 4,000 | 100 | 4,000 | 80 | 3,200 | 60 | 2,400 | 40 | 1,600 |
| Less: Abnormal Gain | (800) | 100 | (800) | 100 | (800) | 100 | (800) | 100 | (800) |
| ***Total*** | ***22,000*** | - | ***20,200*** | - | ***19,400*** | - | ***18,600*** | - | ***17,800*** |

### *Statement of Cost*

| *Elements* | *Total Cost* | *Equivalent Units* | *Cost Per Unit* |
|---|---|---|---|
| Materials I | 12,350 + 1,20,000 – 7,200 = 1,25,150 | 20,200 | 6.1955 |
| Materials II | 13,200 + 30,000 = 43,200 | 19,400 | 2.2268 |
| Labour | 17,500 + 60,000 = 77,500 | 18,600 | 4.1667 |
| Overheads | 11,000 + 60,000 = 71,000 | 17,800 | 3.9888 |
| | | | ***16.5778*** |

### *Statement of Evaluation*

| *Particulars* | *Elements* | *Eq. Units* | *Cost Per Unit* | *Total* |
|---|---|---|---|---|
| Units Transferred | Materials I, II, Labour, Overhead | 17,000 | 16.5778 | ***2,81,822*** |
| Abnormal Gain | Materials I, II, Labour, Overhead | 800 | 16.5778 | ***13,262*** |
| Closing WIP | Materials I | 4,000 | 6.1955 | 24,782 |
| | Materials II | 3,200 | 2.2268 | 7,126 |
| | Labour | 2,400 | 4.1667 | 10,000 |
| | Overhead | 1,600 | 3.9888 | 6,382 |
| | | | | ***48,290*** |

***Note:***

Normal loss given is 10% of production. Here production therefore means those units which come upto the sate of inspection. In that case, opening stock plus receipt minus closing stock of WIP will represent units of production (2,000 units + 20,000 units – 4,000 units). In such case, the unit of production comes to 18,000 unit and hence 1,800 units as normal loss units.

## *PYQ 4*

A product passes through two processes. The output of Process I becomes the input of Process II and the output of Process II is transferred to warehouse. The quantity of raw materials introduced into Process is 20,000 kgs at ₹10 per kg. The cost and output data for the month under review are as under:

| | Process I | Process II |
|---|---|---|
| Direct materials | ₹60,000 | ₹40,000 |
| Direct labour | ₹40,000 | ₹30,000 |
| Production overheads | ₹39,000 | ₹40,250 |
| Normal loss | 8% | 5% |
| Output (kgs) | 18,000 | 17,400 |
| Loss realisation per unit | ₹2.00 | ₹3.00 |

The company's policy is to fix the selling price of the end product in such a way as to yield a Profit of 20% on selling price.

***Required:***

***(a)*** Prepare the Process Accounts.

***(b)*** Determine the Selling price per unit of the end product.

***[(10 Marks) Nov 2002]***

## *Answer*

### *(a) Process I Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Materials Introduced | 20,000 | 2,00,000 | By Normal Loss | 1,600 | 3,200 |
| To Direct Materials | | 60,000 | (8% @ ₹2.00 per unit) | | |
| To Direct Labour | | 40,000 | By Process II Account | 18,000 | 3,28,500 |
| To Production Overhead | | 39,000 | By Abnormal Loss A/c | 400 | 7,300 |
| | ***20,000*** | ***3,39,000*** | | ***20,000*** | ***3,39,000*** |

***Normal Cost Per Unit*** $= \frac{\text{Total Cost} - \text{Sale of Scrap of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{3{,}39{,}000 - 3{,}200}{20{,}000 - 1{,}600} =$ ***18.25 per unit***

### *Process II Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process I Account | 18,000 | 3,28,500 | By Normal Loss | 900 | 2,700 |
| To Direct Materials | | 40,000 | (5% @ ₹3.00 per unit) | | |
| To Direct Labour | | 30,000 | By Finished Stock A/c | 17,400 | 4,43,700 |
| To Production Overhead | | 40,250 | @ ₹25.50 per unit | | |
| To Abnormal Gain | 300 | 7,650 | | | |
| | ***18,300*** | ***4,46,400*** | | ***18,300*** | ***4,46,400*** |

***Normal Cost Per Unit*** $= \frac{\text{Total Cost} - \text{Sale of Scrap of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}}$

$= \frac{4{,}38{,}750 - 2{,}700}{18{,}000 - 900} =$ ***₹25.50 per unit***

### *(b) Determination of selling price of the end product*

Cost per unit of output of process II = ₹25.50

Sales price per unit = 25.50 ÷ 80% = ***₹31.875***

### PYQ 5

From the following information for the month of October 2003, prepare Process III Account:

| | | |
|---|---|---|
| Opening WIP in Process III | : | 1,800 units at ₹27,000 |
| Transfer from Process II | : | 47,700 units at ₹5,36,625 |
| Transferred to Warehouse | : | 43,200 units |
| Closing WIP of Process III | : | 4,500 units |
| Units scrapped | : | 1,800 units |
| Direct material added in Process III | : | ₹1,77,840 |
| Direct Wages | : | ₹87,840 |
| Production overheads | : | ₹43,920 |

***Degree of completion:***

| | *Opening Stock* | *Closing Stock* | *Scrap* |
|---|---|---|---|
| Material | 80% | 70% | 100% |
| Labour | 60% | 50% | 70% |
| Overheads | 60% | 50% | 70% |

***The normal loss in the process was 5% of the production and scrap was sold @ ₹6.75 per unit.***

***[(10 Marks) Nov 2003]***

### Answer

***Statement of Equivalent Production (FIFO Method)***

| Particulars | Units | Materials A | | Materials B | | Labour & OH | |
|---|---|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit | % | Eq. Unit |
| Opening units: | | | | | | | |
| Used for Completed Units | 1,800 | - | - | 20 | 360 | 40 | 720 |
| Units Introduced: | | | | | | | |
| Used for Completed Units | 41,400 | 100 | 41,400 | 100 | 41,400 | 100 | 41,400 |
| Used for Closing WIP | 4,500 | 100 | 4,500 | 70 | 3,150 | 50 | 2,250 |
| Normal Loss | 2,250 | - | - | - | - | - | - |
| Less: Abnormal Gain | (450) | 100 | (450) | 100 | (450) | 100 | (450) |
| ***Total*** | ***49,500*** | - | ***45,450*** | - | ***44,460*** | - | ***43,920*** |

***Statement of Cost***

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials A | 5,36,625 – 15,187 = 5,21,438 | 45,450 | 11.4728 |
| Materials B | 1,77,840 | 44,460 | 4.00 |
| Labour | 87,840 | 43,920 | 2.00 |
| Overheads | 43,920 | 43,920 | 1.00 |
| | | | ***18.4728*** |

***Statement of Evaluation***

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Transferred: | | | | |
| Current Period Cost | Materials A | 41,400 | 11.4728 | 4,74,973 |
| | Materials B | 41,760 | 4.00 | 1,67,040 |
| | Labour, Overhead | 42,120 | 2.00 + 1.00 | 1,26,360 |
| Add: Cost of Opening WIP | | | | 27,000 |
| (Used in completed units) | | | | ***7,95,373*** |
| Closing WIP | Materials A | 4,500 | 11.4728 | 51,628 |
| | Materials B | 3,150 | 4.00 | 12,600 |
| | Labour, Overhead | 2,250 | 2.00 + 1.00 | 6,750 |
| | | | | ***70,978*** |
| Abnormal Gain | All | 450 | 18.4728 | ***8,313*** |

**Process III Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Opening WIP | 1,800 | 27,000 | By Normal Loss | 2,250 | 15,187 |
| To Process II Account | 47,700 | 5,36,625 | (5% of 45,000 units) | | |
| To Direct Materials | | 1,77,840 | By Finished Goods A/c | 43,200 | 7,95,373 |
| To Direct Labour | | 87,840 | By closing WIP | 4,500 | 70,978 |
| To Production Overhead | | 43,920 | | | |
| To Abnormal Gain | 450 | 8,313 | | | |
| | **49,950** | **8,81,538** | | **49,950** | **8,81,538** |

**Working note**

Production units = Opening units + Units transferred from process II - Closing units
= 1,800 units + 47,700 units - 4,500 units = **45,000 units**

## PYQ 6

From the following information for the month ending October, 2005, prepare Process Cost Accounts for Process III.

***Use First-in-first-out (FIFO) method to value equivalent production.***

| | |
|---|---|
| Direct materials added in Process III (Opening WIP) | 2,000 units at ₹25,750 |
| Transfer from Process II | 53,000 units at ₹4,11,500 |
| Transferred to Process IV | 48,000 units |
| Closing stock of Process III | 5,000 units |
| Units scrapped | 2,000 units |
| Direct material added in Process III | ₹1,97,600 |
| Direct wages | ₹97,600 |
| Production Overheads | ₹48,800 |

***Degree of completion:***

| | Opening Stock | Closing Stock | Scrap |
|---|---|---|---|
| Material | 80% | 70% | 100% |
| Labour | 60% | 50% | 70% |
| Overheads | 60% | 50% | 70% |

***The normal loss in the process was 5% of production and scrap was sold at ₹3 per unit.***

***[(14 Marks) Nov 2005]***

## Answer

**Process III Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Opening WIP | 2,000 | 25,750 | By Normal Loss | 2,500 | 7,500 |
| To Process II Account | 53,000 | 4,11,500 | By Process IV A/c | 48,000 | 7,19,750 |
| To Direct Materials | | 1,97,600 | By closing WIP | 5,000 | 61,500 |
| To Direct Labour | | 97,600 | | | |
| To Production Overhead | | 48,800 | | | |
| To Abnormal Gain | 500 | 7,500 | | | |
| | **55,500** | **7,88,750** | | **55,500** | **7,88,750** |

**Working Notes:**

**Statement of Equivalent Production (FIFO Method)**

| Particulars | Units | Materials A | | Materials B | | Labour & OH | |
|---|---|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit | % | Eq. Unit |
| Opening units: | | | | | | | |
| Used for Completed Units | 2,000 | - | - | 20 | 400 | 40 | 800 |
| Units Introduced: | | | | | | | |
| Used for Completed Units | 46,000 | 100 | 46,000 | 100 | 46,000 | 100 | 46,000 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Used for Closing WIP | 5,000 | 100 | 5,000 | 70 | 3,500 | 50 | 2,500 |
| Normal Loss | 2,500 | - | - | - | - | - | - |
| Less: Abnormal Gain | (500) | 100 | (500) | 100 | (500) | 100 | (500) |
| ***Total*** | ***55,000*** | ***-*** | ***50,500*** | ***-*** | ***49,400*** | ***-*** | ***48,800*** |

***Statement of Cost***

| *Elements* | *Cost* | *Equivalent Units* | *Cost Per Unit* |
|---|---|---|---|
| Materials A | 4,11,500 – 7,500 = 4,04,000 | 50,500 | 8.00 |
| Materials B | 1,97,600 | 49,400 | 4.00 |
| Labour | 97,600 | 48,800 | 2.00 |
| Overheads | 48,800 | 48,800 | 1.00 |
| | | | ***15.00*** |

***Statement of Evaluation***

| *Particulars* | *Elements* | *Eq. Units* | *Cost Per Unit* | *Total* |
|---|---|---|---|---|
| Units Transferred: | | | | |
| Current Period Cost | Materials A | 46,000 | 8.00 | 3,68,000 |
| | Materials B | 46,400 | 4.00 | 1,85,600 |
| | Labour, Overhead | 46,800 | 2.00 + 1.00 | 1,40,400 |
| Add: Cost of Opening WIP (Used in completed units) | | | | 25,750 |
| | | | | ***7,19,750*** |
| Closing WIP | Materials A | 5,000 | 8.00 | 40,000 |
| | Materials B | 3,500 | 4.00 | 14,000 |
| | Labour, Overhead | 2,500 | 2.00 + 1.00 | 7,500 |
| | | | | ***61,500*** |
| Abnormal Gain | Materials A, B, Labour, Overhead | 500 | 15.00 | ***7,500*** |

***Note:***

Normal loss (NL) = 5% of production = 5% of 50,000 (2,000 + 53,000 - 5,000)
= ***2,500 units***

## *PYQ 7*

A Company produces a component, which passes through two processes. During the month of April, 2006, materials for 40,000 components were put into Process I of which 30,000 were completed and transferred to Process II. Those not transferred to Process II were 100% complete as to materials cost and 50% complete as to labour and overheads cost.

***The Process I costs incurred were as follows:***

| | |
|---|---|
| Direct Materials | ₹15,000 |
| Direct Wages | ₹18,000 |
| Factory Overheads | ₹12,000 |

Of those transferred to Process II, 28,000 units were completed and transferred to finished goods stores. There was a normal loss with no salvage value of 200 units in Process II. There were 1,800 units, remained unfinished in the process with 100% complete as to material and 25% complete as regard to wages and overheads.

***The process and packing costs incurred at the end of the Process II were:***

| | |
|---|---|
| Packing Materials | ₹4,000 |
| Direct Wages | ₹3,500 |
| Factory Overheads | ₹4,500 |

Packing material cost is incurred at the end of the second process as protective packing to the completed units of production.

***Required:***

*(i)* Prepare Statement of Equivalent Production, Cost Per unit and Process I A/c

*(ii)* Prepare State of Equivalent Production, Cost per Unit and Process II A/C

***[(10 Marks) May 2006]***

## *Answer*

### *Statement of Equivalent Production (Process I)*

| Particulars | Units | Materials | | Labour & Overhead | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Transfer to Process II | 30,000 | 100 | 30,000 | 100 | 30,000 |
| Closing WIP | 10,000 | 100 | 10,000 | 50 | 5,000 |
| ***Total*** | ***40,000*** | - | ***40,000*** | - | ***35,000*** |

### *Statement of Cost (Process I)*

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Direct Materials | 15,000 | 40,000 | 0.37500 |
| Direct Wages | 18,000 | 35,000 | 0.51429 |
| Factory Overheads | 12,000 | 35,000 | 0.34286 |
| Total cost per unit | | | 1.23215 |

### *Statement of Apportionment of Cost (Process I)*

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Transfer to Process II | Materials, Labour, Overhead | 30,000 | 1.23215 | ***36,964*** |
| Closing WIP | Materials | 10,000 | .375 | 3,750 |
| | Labour, Overhead | 5,000 | .51429 + .34286 | 4,286 |
| | | | | ***8,036*** |

### *Process I Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Direct Materials | 40,000 | 15,000 | By Process II A/c | 30,000 | 36,964 |
| To Direct Labour | | 18,000 | By Closing WIP | 10,000 | 8,036 |
| To Overhead | | 12,000 | | | |
| | ***40,000*** | ***45,000*** | | ***40,000*** | ***45,000*** |

### *Statement of Equivalent Production (Process II)*

| Particulars | Units | Materials | | Labour & Overhead | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Normal Loss | 200 | - | - | - | - |
| Units Completed | 28,000 | 100 | 28,000 | 100 | 28,000 |
| Closing WIP | 1,800 | 100 | 1,800 | 25 | 450 |
| ***Total*** | ***30,000*** | - | ***29,800*** | - | ***28,450*** |

### *Statement of Cost (Process II)*

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Direct Materials | 36,964 | 29,800 | 1.2404 |
| Direct Wages | 3,500 | 28,450 | 0.1230 |
| Factory Overheads | 4,500 | 28,450 | 0.1582 |
| | | | ***1.5216*** |

### *Statement of Apportionment of Cost (Process II)*

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Completed | All | 28,000 | 1.5216 | 42,605 |
| Add: Packing Expenses | | | | 4,000 |

| | | | | |
|---|---|---|---|---|
| (Only at completed units) | | | | ***46,605*** |
| Closing WIP | Materials | 1,800 | 1.2404 | 2,233 |
| | Labour, Overhead | 450 | .1230 + .1582 | 126 |
| | | | | ***2,359*** |

* ₹4,000 represents packing cost. This cost is incurred on completion of units at the end of Process II. Completed units are then transferred to finished stock. This cost is thus, charged to finished stock.

***Process II Account***

| ***Particulars*** | ***Units*** | ***₹*** | ***Particulars*** | ***Units*** | ***₹*** |
|---|---|---|---|---|---|
| To Process I A/c | 30,000 | 36,964 | By Normal loss | 200 | - |
| To Direct Labour | | 3,500 | By Finished Stock | 28,000 | 46,605 |
| To Overhead | | 4,500 | By Closing WIP | 1,800 | 2,359 |
| To Packing Materials | | 4,000 | | | |
| | ***30,000*** | ***48,964*** | | ***30,000*** | ***48,964*** |

***PYQ 8***

Following details are related to the work done in Process 'A' of XYZ Company during the month of March, 2007:

| | |
|---|---|
| ***Opening work-in-progress*** | ***2,000 units*** |
| Materials | ₹80,000 |
| Labour | ₹15,000 |
| Overheads | ₹45,000 |
| ***Materials introduced in Process 'A'*** | ***38,000 units*** |
| Materials | ₹14,80,000 |
| Direct labour | ₹3,59,000 |
| Overheads | ₹10,77,000 |
| ***Units scrapped*** | ***3,000 units*** |
| ***Degree of completion:*** | |
| Materials | 100% |
| Labour and overheads | 80% |
| ***Closing work-in-progress*** | ***2,000 units*** |
| ***Degree of completion:*** | |
| Materials | 100% |
| Labour and overhead | 80% |
| Units finished and transferred to Process 'B' | 35,000 units |
| Normal loss to total input including opening work-in-progress | 5% |
| Scrapped units fetch | ₹20 per unit |

***You are required to prepare***

1. Statement of equivalent production;
2. Statement of cost;
3. Statement of distribution cost; and
4. Process 'A' Account, Normal and Abnormal Loss Accounts.

***[(8 Marks) May 2007]***

***Answer***

***1. Statement of Equivalent Production (Average Cost Method)***

| ***Particulars*** | ***Total Units*** | ***Materials*** | | ***Processing Cost*** | |
|---|---|---|---|---|---|
| | | ***%*** | ***Unit*** | ***%*** | ***Unit*** |
| Units Completed | 35,000 | 100 | 35,000 | 100 | 35,000 |
| Normal loss | 2,000 | - | - | - | - |
| Abnormal Loss | 1,000 | 100 | 1,000 | 80 | 800 |
| Closing WIP | 2,000 | 100 | 2,000 | 80 | 1,600 |
| ***Total*** | ***40,000*** | - | ***38,000*** | - | ***37,400*** |

### 2. Statement of Cost

| Elements | Total Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 80,000 + 14,80,000 – 40,000 = 15,20,000 | 38,000 | 40.00 |
| Labour | 15,000 + 3,59,000 = 3,74,000 | 37,400 | 10.00 |
| Overheads | 45,000 + 10,77,000 = 11,22,000 | 37,400 | 30.00 |
| | | | **80.00** |

### 3. Statement of Evaluation

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Completed | Materials, Labour, Overheads | 35,000 | 80.00 | **28,00,000** |
| Abnormal Loss | Materials | 1,000 | 40.00 | 40,000 |
| | Labour, Overheads | 800 | 10.00 + 30.00 | 32,000 |
| | | | | **72,000** |
| Closing WIP | Materials | 2,000 | 40.00 | 80,000 |
| | Labour, Overheads | 1,600 | 10.00 + 30.00 | 64,000 |
| | | | | **1,44,000** |

### 4. Process A Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Opening WIP | 2,000 | 1,40,000 | By Normal Loss | 2,000 | 40,000 |
| To Direct Materials | 38,000 | 14,80,000 | By Process B A/c | 35,000 | 28,00,000 |
| To Direct Labour | | 3,59,000 | By Abnormal Loss A/c | 1,000 | 72,000 |
| To Overhead | | 10,77,000 | By Closing WIP | 2,000 | 1,44,000 |
| | **40,000** | **30,56,000** | | **40,000** | **30,56,000** |

### Normal Loss Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process A A/c | 2,000 | 40,000 | By Cash A/c | 2,000 | 40,000 |
| | **2,000** | **40,000** | | **2,000** | **40,000** |

### Abnormal Loss Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process A A/c | 1,000 | 72,000 | By Cash A/c | 1,000 | 20,000 |
| | | | By Costing P&L A/c (b.f.) | | 72,000 |
| | **1,000** | **72,000** | | **1,000** | **72,000** |

### PYQ 9

BC Limited manufactures a product 'ZX' by using the process namely RT. For the month of May' 2007, the following data are available:

**Process RT**

| | |
|---|---|
| Material introduced | 16,000 units |
| Transfer to next process | 14,400 units |
| Work in process: | |
| At the beginning of the month (4/5 completed) | 4,000 units |
| At the end of the month (2/3 completed) | 3,000 units |

**Cost records:**

| | |
|---|---|
| Work in process at the beginning of the month | |
| Material | ₹30,000 |
| Conversion cost | ₹29,200 |
| Cost during the month: | |
| Materials | ₹1,20,000 |
| Conversion cost | ₹1,60,800 |

Normal spoiled units are 10% of goods finished output transferred to next process. Defects in these units are identified in their finished state. Material for the product is put in the process at the beginning of the cycle of operation, whereas labour and other indirect cost flow evenly over the year. It has no realisable value for spoiled units.

***Required***

1. Statement of equivalent producing (Average cost method);
2. Statement of cost and distribution of cost;
3. Process accounts.

***[(8 Marks) Nov 2007]***

## *Answer*

### *1. Statement of Equivalent Production (Average Cost Method)*

| Particulars | Total | Materials | | Conversion Cost | |
|---|---|---|---|---|---|
| | Unit | % | Unit | % | Unit |
| Normal loss | 1,440 | - | - | - | - |
| Units Completed | 14,400 | 100 | 14,400 | 100 | 14,400 |
| Abnormal Loss | 1,160 | 100 | 1,160 | 100 | 1,160 |
| Closing WIP | 3,000 | 100 | 3,000 | ⅔ | 2,000 |
| ***Total*** | ***20,000*** | - | ***18,560*** | - | ***17,560*** |

### *2.Statement of Cost*

| Elements | Total Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 30,000 + 1,20,000 = 1,50,000 | 18,560 | 8.0819 |
| Conversion Cost | 29,200 + 1,60,800 = 1,90,000 | 17,560 | 10.82 |
| | | | ***18.9019*** |

### *3. Process RT Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Opening WIP | 4,000 | 59,200 | By Normal Loss | 1,440 | - |
| To Direct Materials | 16,000 | 1,20,000 | By Next Process A/c | 14,400 | 2,72,188 |
| To Conversion Cost | | 1,60,800 | By Abnormal Loss A/c | 1,160 | 21,926 |
| | | | By Closing WIP | 3,000 | 45,886 |
| | ***20,000*** | ***3,40,000*** | | ***20,000*** | ***3,40,000*** |

***Working Notes:***

### *Statement of Evaluation*

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Completed | Materials, Conversion Cost | 14,400 | 18.9019 | ***2,72,188*** |
| Abnormal Loss | Materials, Conversion Cost | 1,160 | 18.9019 | ***21,926*** |
| Closing WIP | Materials | 3,000 | 8.0819 | 24,246 |
| | Conversion Cost | 2,000 | 10.82 | 21,640 |
| | | | | ***45,886*** |

## *PYQ 10*

JK Ltd. produces a product "AZE", which passes through two processes viz. process I and process II. The output of each process is treated as the raw material of the next process to which it is transferred and output of the second process is transferred to finished stock. The following data related to December' 2007:

| | Process I | Process II |
|---|---|---|
| 25,000 units introduced at a cost of | ₹2,00,000 | - |
| Material consumed | ₹1,92,000 | ₹96,020 |
| Direct labour | ₹2,24,000 | ₹1,28,000 |
| Manufacturing expenses | ₹1,40,000 | ₹60,000 |
| Normal wastage of input | 10% | 10% |

| | | |
|---|---|---|
| Scrap value of normal wastage (per unit) | ₹9.90 | ₹8.60 |
| Output in Units | 22,000 | 20,000 |

**Required:**

1. Prepare Process I and Process II account.
2. Prepare Abnormal effective/wastage account as the case may be each process.

**[(8 Marks) May 2008]**

## Answer

### Process I Account

| Particulars | Qty | ₹ | Particulars | Qty | ₹ |
|---|---|---|---|---|---|
| To Units introduced | 25,000 | 2,00,000 | By Normal Wastage | 2,500 | 24,750 |
| To Materials | | 1,92,000 | By Abnormal Loss | 500 | 16,250 |
| To Direct Labour | | 2,24,000 | By Process II A/c | 22,000 | 7,15,000 |
| To Manufacturing Exp | | 1,40,000 | | | |
| | **25,000** | **7,56,000** | | **25,000** | **7,56,000** |

**Normal Cost per unit** $= \dfrac{7{,}56{,}000 - 24{,}750}{25{,}000 - 2{,}500} =$ **32.50 per unit**

### Abnormal Loss A/c

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process I A/c | 500 | 16,250 | By Cash A/c | 500 | 4,950 |
| | | | By Profit and Loss A/c | | 11,300 |
| | **500** | **16,250** | | **500** | **16,250** |

### Process II Account

| Particulars | Qty | ₹ | Particulars | Qty | ₹ |
|---|---|---|---|---|---|
| To Process I A/c | 22,000 | 7,15,000 | By Normal Wastage | 2,200 | 18,920 |
| To Materials | | 96,020 | By Finished Stock | 20,000 | 9,90,000 |
| To Direct Labour | | 1,28,000 | | | |
| To Manufacturing Exp | | 60,000 | | | |
| To Abnormal Gain | 200 | 9900 | | | |
| | **22,200** | **10,08,920** | | **22,200** | **10,08,920** |

**Normal Cost per unit** $= \dfrac{9{,}99{,}020 - 18{,}920}{22{,}000 - 2{,}200} =$ **49.50 per unit**

### Normal loss A/c

| Particulars | Unit | Amount | Particulars | Unit | Amount |
|---|---|---|---|---|---|
| To Process I A/c | 2,500 | 24,750 | By Abnormal Gain A/c | 200 | 1,720 |
| To Process II A/c | 2,200 | 18,920 | By Sales (I) A/c | 2,500 | 24,750 |
| | | | By Sales (II) A/c | 2,000 | 17,200 |
| | **4,700** | **43,670** | | **4,700** | **43,670** |

### Abnormal Gain A/c

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Normal Loss A/c | 200 | 1,720 | By Process II A/c | 200 | 9,900 |
| To Profit and Loss A/c | | 8,180 | | | |
| | **200** | **9,900** | | **200** | **9,900** |

## PYQ 11

A product passes from Process I and Process II. Materials issued to Process I amounted to ₹40,000, labour ₹30,000 and manufacturing overheads were ₹27,000. Normal loss was 3% of input as estimated but 500 more units of output of Process I were lost due to the carelessness of workers. Only 4,350 units of output were transferred to Process II. There were no opening stocks. Input raw material issued to Process I were 5,000 units. You are required to show Process I account. **[(3 Marks) Nov 2008]**

## Answer

**Process I A/c**

| Particulars | Units | Amount | Particulars | Units | Amount |
|---|---|---|---|---|---|
| To Materials | 5,000 | 40,000 | By Normal Loss A/c | 150 | - |
| To labour | | 30,000 | By Abnormal Loss A/c | 500 | 10,000 |
| To manufacturing OH | | 27,000 | By Process II A/c | 4,350 | 87,000 |
| | **5,000** | **97,000** | | **5,000** | **97,000** |

**Working Notes:**

**Normal Cost Per Unit** $= \frac{40,000 + 30,000 + 27,000}{5,000 - 150} =$ **₹20 per units**

**Note:** In the absence of any information, sale value of scrap of normal loss units is assumed to be Nil.

## PYQ 12

**XP Ltd. furnished you the following information relating to process II.**

| | | |
|---|---|---|
| (i) | Opening work-in-progress | NIL |
| (ii) | Units introduced | 42,000 units @ ₹12 |
| (iii) | **Expenses debited to the process:** | |
| | Direct material | ₹61,530 |
| | Labour | ₹88,820 |
| | Overheads | ₹1,76,400 |
| (iv) | Normal loss in the process | 2% of input |
| (v) | Closing work-in-process | 1,200 units |
| | **Degree of completion:** | |
| | Materials | 100% |
| | Labour | 50% |
| | Overhead | 40% |
| (vi) | Finished output | 39,500 units |
| (vii) | **Degree of completion of abnormal loss:** | |
| | Materials | 100% |
| | Labour | 80% |
| | Overhead | 60% |

*(viii)* Units scraped as normal loss were sold at ₹4.50 per unit.
*(ix)* All the units of abnormal loss were sold at ₹9 per unit.

**Prepare:**

*(a)* Statement of equivalent production.
*(b)* Statement showing the cost of finished goods, abnormal loss and closing work-in-progress.
*(c)* Process II account and abnormal loss account.

**[(8 Marks) Nov 2009]**

## Answer

**Process RT Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Units Introduced | 42,000 | 5,04,000 | By Normal Loss A/c | 840 | 3,780 |
| To Direct Materials | | 61,530 | By Abnormal Loss A/c | 460 | 8,294 |
| To Labour | | 88,820 | By Finished Goods | 39,500 | 7,98,880 |
| To Overhead | | 1,76,400 | By Closing WIP | 1,200 | 19,796 |
| | **42,000** | **8,30,750** | | **42,000** | **8,30,750** |

**Statement of Equivalent Production**

| Particulars | Units | Materials | | Labour | | Overhead | |
|---|---|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit | % | Eq. Unit |
| Normal Loss | 840 | - | - | - | - | - | - |
| Units Completed | 39,500 | 100 | 39,500 | 100 | 39,500 | 100 | 39,500 |
| Abnormal Loss | 460 | 100 | 460 | 80 | 368 | 60 | 260 |
| Closing WIP | 1,200 | 100 | 1,200 | 50 | 600 | 40 | 480 |
| **Total** | **42,000** | **-** | **41,160** | **-** | **40,468** | **-** | **40,256** |

**Statement of Cost**

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 5,04,000 + 61,530 – 3,780 = 5,61,750 | 41,160 | 13.648 |
| Labour | 88,820 | 40,468 | 2.1948 |
| Overhead | 1,76,400 | 40,256 | 4.382 |
| | | | **20.2248** |

**Statement of Evaluation**

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Completed | Materials, Labour and OH | 39,500 | 20.2248 | **7,98,880** |
| Abnormal Loss | Materials | 460 | 13.648 | 6,278 |
| | Labour | 368 | 2.1948 | 807 |
| | Overheads | 276 | 4.382 | 1,209 |
| | | | | **8,294** |
| Closing WIP | Materials | 1,200 | 13.648 | 16,377 |
| | Labour | 600 | 2.1948 | 1,316 |
| | Overheads | 480 | 4.382 | 2,103 |
| | | | | **19,796** |

**Abnormal Loss Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process II A/c | 460 | 8,295 | By Cash @ ₹9 per unit | 460 | 4,140 |
| | | | By Costing P & L A/c | - | 4,155 |
| | **460** | **8,295** | | **460** | **8,295** |

### PYQ 13

Pharma Limited produces product 'Glucodin' which passes through two processes before it is completed and transferred to finished stock. The following data relates to March, 2010:

| Details | Process I | Process II | Finished Stock |
|---|---|---|---|
| Opening Stock | 1,50,000 | 1,80,000 | 4,50,000 |
| Direct materials | 3,00,000 | 3,15,000 | - |
| Direct Wages | 2,24,000 | 2,25,000 | - |
| Factory overheads | 2,10,000 | 90,000 | - |
| Closing Stock | 74,000 | 90,000 | 2,25,000 |
| Inter process profit included in Opening stock | NIL | 30,000 | 1,65,000 |

Output of process I is transferred to Process II at 25 percent profit on the transfer price, whereas output of process II is transferred to finished stock at 20 percent on transfer price. Stock in process is valued at prime cost. Finished stock is valued at the price at which it is received from process II. Sales for the month is ₹28,00,000.

***You are required to prepare Process I A/c, Process II A/c, and Finished Stock A/c showing the profit element at each stage.***

***[(8 Marks) May 2010]***

**Answer**

**Process I A/c**

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Opening Stock | 1,50,000 | 1,50,000 | - | Process II A/c | 10,80,000 | 8,10,000 | 2,70,000 |
| Materials | 3,00,000 | 3,00,000 | - | | | | |
| Wages | 2,24,000 | 2,24,000 | - | Closing Stock | 74,000 | 74,000 | - |
| Prime Cost | 6,74,000 | 6,74,000 | - | | | | |
| Factory OH | 2,10,000 | 2,10,000 | - | | | | |
| Total Cost | 8,84,000 | 8,84,000 | - | | | | |
| Profit | 2,70,000 | - | 2,70,000 | | | | |
| | **11,54,000** | **8,84,000** | **2,70,000** | | **11,54,000** | **8,84,000** | **2,70,000** |

**Process II A/c**

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Opening Stock | 1,80,000 | 1,50,000 | 30,000 | Finished Stock A/c | 22,50,000 | 15,15,000 | 7,35,000 |
| Process I A/c | 10,80,000 | 8,10,000 | 2,70,000 | | | | |
| Materials | 3,15,000 | 3,15,000 | - | Closing Stock | 90,000 | 75,000 | 15,000 |
| Wages | 2,25,000 | 2,25,000 | - | | | | |
| Prime Cost | 18,00,000 | 15,00,000 | 3,00,000 | | | | |
| Factory OH | 90,000 | 90,000 | - | | | | |
| Total Cost | 18,90,000 | 15,90,000 | 3,00,000 | | | | |
| Profit | 4,50,000 | - | 4,50,000 | | | | |
| | **23,40,000** | **15,90,000** | **7,50,000** | | **23,40,000** | **15,90,000** | **7,50,000** |

**Profit element in closing stock** $= \frac{3,00,000}{18,00,000} \times 90,000 =$ **15,000**

**Finished Stock A/c**

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Opening Stock | 4,50,000 | 2,85,000 | 1,65,000 | Costing P/L A/c | 28,00,000 | 16,48,500 | 11,51,500 |
| Process II | 22,50,000 | 15,15,000 | 7,35,000 | Closing Stock | 2,25,000 | 1,51,500 | 73,500 |
| Profit | 3,25,000 | - | 3,25,000 | | | | |
| | **30,25,000** | **18,00,000** | **12,25,000** | | **30,25,000** | **18,00,000** | **12,25,000** |

**Profit element in closing stock** $= \frac{7,35,000}{22,50,000} \times 2,25,000 =$ **73,500**

**PYQ 14**

**Following information is available regarding Process A for the month of October 2010:**

**Production record:**

| | |
|---|---|
| Opening work-in-process | 40,000 units |
| (Materials 100% complete, 25% complete labour & overheads) | |
| Units introduced | 1,80,000 units |
| Units completed | 1,50,000 units |
| Units in process on 31.10.2010 | 70,000 units |
| (Materials 100% complete, 50% complete labour & overheads) | |

**Cost record:**

Opening WIP:

| | |
|---|---|
| Materials | ₹1,00,000 |
| Labour | ₹25,000 |
| Overheads | ₹45,000 |

Cost incurred during the month:

| | |
|---|---|
| Materials | ₹6,60,000 |
| Labour | ₹5,55,000 |
| Overheads | ₹9,25,000 |

***Assure that FIFO method is used for WIP inventory valuation.***

***You are required to prepare:***

***(1)*** Statement of Equivalent Production.
***(2)*** Statement showing Cost for each element.
***(3)*** Statement of apportionment of Cost.
***(4)*** Process A Account.

***[(8 Marks) Nov 2010]***

## *Answer*

### *(1) Statement of Equivalent Production*

| *Particulars* | *Units* | *Materials* | | *Labour & Overhead* | |
|---|---|---|---|---|---|
| | | *%* | *Eq. Unit* | *%* | *Eq. Unit* |
| Opening units: | | | | | |
| Used for Completed Units | 40,000 | - | - | 75 | 30,000 |
| Units Introduced: | | | | | |
| Used for Completed Units | 1,10,000 | 100 | 1,10,000 | 100 | 1,10,000 |
| Used for Closing WIP | 70,000 | 100 | 70,000 | 50 | 35,000 |
| ***Total*** | ***2,20,000*** | ***-*** | ***1,80,000*** | ***-*** | ***1,75,000*** |

### *(2) Statement Showing Cost for each Element*

| *Elements* | *Cost* | *Equivalent Units* | *Cost Per Unit* |
|---|---|---|---|
| Materials | 6,60,000 | 1,80,000 | 3.66667 |
| Labour | 5,55,000 | 1,75,000 | 3.17143 |
| Overheads | 9,25,000 | 1,75,000 | 5.28571 |
| ***Total Cost Per Unit*** | | | ***12.12381*** |

### *(3) Statement of Evaluation*

| *Particulars* | *Elements* | *Eq. Units* | *Cost Per Unit* | *Total* |
|---|---|---|---|---|
| Units Transferred: | | | | |
| Current Period Cost | Materials | 1,10,000 | 3.66667 | 4,03,333 |
| | Labour, Overhead | 1,40,000 | 8.45714 | 11,84,000 |
| Add: Cost of Opening WIP | | | | 1,70,000 |
| (Used in completed units) | | | | ***17,57,333*** |
| Closing WIP | Materials | 70,000 | 3.66667 | 2,56,667 |
| | Labour, Overhead | 35,000 | 8.45714 | 2,96,000 |
| | | | | ***5,52,667*** |

### *(4) Process A Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Opening WIP | 40,000 | 1,70,000 | By Process B A/c | 1,50,000 | 17,57,333 |
| To Units Introduced | 1,80,000 | 6,60,000 | By Closing WIP | 70,000 | 5,52,667 |
| To Labour | | 5,55,000 | | | |
| To Overhead | | 9,25,000 | | | |
| | ***2,20,000*** | ***23,10,000*** | | ***2,20,000*** | ***23,10,000*** |

## *PYQ 15*

The following details are available of Process X for August 2011.

***(1)*** Opening work-in process 8,000 units

***Degree of completion and cost:***

| | |
|---|---|
| Materials (100%) | ₹63,900 |
| Labour (60%) | ₹10,800 |
| Overheads (60%) | ₹5,400 |

| | | |
|---|---|---|
| ***(2)*** | Input 1,82,000 units at | ₹7,56,900 |
| ***(3)*** | Labour paid | ₹3,28,000 |
| ***(4)*** | Overheads incurred | ₹1,64,000 |
| ***(5)*** | Units scrapped | 14,000 |

***Degree of completion:***

| | |
|---|---|
| Material | 100% |
| Labour and overhead | 80% |

***(6)*** Closing work-in-process — 18000 units

***Degree of completion:***

| | |
|---|---|
| Material | 100% |
| Labour and overhead | 70% |

***(7)*** 1,58,000 units were completed and transferred to next process.
***(8)*** Normal loss is 8% of total input including opening work-in-process
***(9)*** Scrap value is ₹8 per unit to be adjusted in direct material cost.

***You are required to compute, assuming that average method of inventory is used:***

***(a)*** Equivalent production,
***(b)*** Cost per unit.

***[(8 Marks) Nov 2011]***

## ***Answer***

***(a) Statement of Equivalent Production***

| Particulars | Input | Particulars | Output | Materials | | Conversion Cost | |
|---|---|---|---|---|---|---|---|
| | | | | % | Unit | % | Unit |
| Opening WIP | 8,000 | Transf. to next Process | 1,58,000 | 100 | 1,58,000 | 100 | 1,58,000 |
| Fresh Units | 1,82,000 | Normal Loss (8 % of 1,90,000) | 15,200 | - | - | - | - |
| | | Abnormal Gain | (1,200) | 100 | (1,200) | 100 | (1,200) |
| | | Closing WIP (given) | 18,000 | 100 | 18,000 | 70 | 12,600 |
| ***Total*** | ***1,90,000*** | ***Total*** | ***1,90,000*** | - | ***1,74,800*** | - | ***1,69,400*** |

***(b) Statement of Cost***

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 63,900 + 7,56,900 – 1,21,600 (15,200 × 8) = 6,99,200 | 1,74,800 | 4.00 |
| Labour | 10,800 + 3,28,000 = 3,38,800 | 1,69,400 | 2.00 |
| Overhead | 5,400 + 1,64,000 = 1,69,400 | 1,69,400 | 1.00 |
| | | | ***7.00*** |

## ***PYQ 16***

A product passes through two processes A and B. During the year 2011, the input to process A of basic raw material was 8,000 units @ ₹9 per unit. Other information for the year is as follows:

| Details | Process A | Process B |
|---|---|---|
| Output units | 7,500 | 4,800 |
| Normal loss (% to input) | 5% | 10% |
| Scrap value per unit (₹) | 2 | 10 |
| Direct wages (₹) | 12,000 | 24,000 |
| Direct expenses (₹) | 6,000 | 5,000 |
| Sales value per unit (₹) | 15 | 25 |

Total overheads ₹17,400 were recovered as percentage of direct wages. Selling expenses were ₹5,000. These are not allocable to the processes. $^2/_3$ of the output of Process A was passed on to the next process and the balance was sold. The entire output of Process B was sold. Prepare Process A and B Accounts.

**[(8 Marks) May 2012]**

## Answer

**Process A Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Raw Materials | 8,000 | 72,000 | By Normal Loss A/c | 400 | 800 |
| To Direct Wages | | 12,000 | By Abnormal Loss A/c | 100 | 1,250 |
| To Direct Expenses | | 6,000 | By Process B A/c | 5,000 | 62,500 |
| To Overheads | | 5,800 | By Profit & Loss A/c | 2,500 | 31,250 |
| (17,400 × $^{12}/_{36}$) | **8,000** | **95,800** | | **8,000** | **95,800** |

**Normal Cost Per Unit** $= \dfrac{95{,}800 - 800}{8{,}000 - 400} =$ **₹12.50**

**Note:**

*(i)* Processes assumed to be not a responsibility centre. Hence units sold in market have been transferred to profit & loss A/c on cost.

*(ii)* Sales expenses are not allocable to the processes, it would be debited in profit & loss A/c.

**Process B Account**

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process A A/c | 5,000 | 62,500 | By Normal Loss A/c | 500 | 5,000 |
| To Direct Wages | | 24,000 | By Profit & Loss A/c | 4,800 | 1,04,640 |
| To Direct Expenses | | 5,000 | | | |
| To Overheads | | 11,600 | | | |
| (17,400 × $^{24}/_{36}$) | | | | | |
| To Abnormal Gain | 300 | 6,540 | | | |
| | **5,300** | **1,09,640** | | **5,300** | **1,09,640** |

**Normal Cost Per Unit** $= \dfrac{1{,}03{,}100 - 5{,}000}{5{,}000 - 500} =$ **₹21.80**

## PYQ 17

***ABX Company Ltd provide the following information relating to Process B:***

| | | | |
|---|---|---|---|
| *(i)* | Opening Work-in-progress | : | Nil |
| *(ii)* | Units Introduced | : | 45,000 units @ ₹10 per unit |
| *(iii)* | ***Expense debited to the process:*** | | |
| | Direct material | : | ₹65,500 |
| | Labour | : | ₹90,800 |
| | Overhead | : | ₹1,80,700 |
| *(iv)* | Normal loss in the process | : | 2% of Input |
| *(v)* | Work-in-progress | : | 1,800 units |
| | ***Degree of completion:*** | | |
| | Materials | : | 100% |
| | Labour | : | 50% |
| | Overhead | : | 40% |
| *(vi)* | Finish output | : | 42,000 units |
| *(vii)* | ***Degree of completion of a abnormal loss:*** | | |
| | Material | : | 100% |
| | Labour | : | 80% |
| | Overhead | : | 60% |
| *(viii)* | Units scrapped as normal loss were sold | : | at ₹5 per units. |
| *(ix)* | All the units of abnormal loss were sold | : | at ₹2 per units. |

***You are required to prepare:***

(A) Statement of equivalent production.
(B) Statement showing the cost of finished goods, abnormal loss and closing balance of work-in-progress.
(C) Process B account and abnormal loss account.

***[(10 Marks) May 13]***

## *Answer*

### *(A) Statement of Equivalent Production*

| Particulars | Units | Materials | | Labour | | Overhead | |
|---|---|---|---|---|---|---|---|
| | | % | E. Units | % | E. Units | % | E. Units |
| Normal Loss (45,000 × 2%) | 900 | - | - | - | - | - | - |
| Finished Output | 42,000 | 100 | 42,000 | 100 | 42,000 | 100 | 42,000 |
| Units in WIP | 1,800 | 100 | 1,800 | 50 | 900 | 40 | 20 |
| Abnormal Loss (b.f.) | 300 | 100 | 300 | 80 | 240 | 60 | 180 |
| ***Total*** | ***45,000*** | - | ***44,100*** | - | ***43,140*** | - | ***42,900*** |

### *(B) Statement Showing the Cost of Finished Goods, Abnormal Loss & Closing WIP*

| Particulars | Elements | Equivalent Units | Cost Per Unit | ₹ |
|---|---|---|---|---|
| **1.** Finished Goods | All (M, L, OH) | 42,000 | 17.9042 | ***7,51,976*** |
| **2.** Abnormal Loss | Materials | 300 | 11.5873 | 3,477 |
| | Labour | 240 | 2.1048 | 505 |
| | Overheads | 180 | 4.2121 | 758 |
| | | | | ***4,740*** |
| **3.** Closing WIP | Materials | 1,800 | 11.5873 | 20,857 |
| | Labour | 900 | 2.1048 | 1,894 |
| | Overheads | 720 | 4.2121 | 3,033 |
| | | | | ***25,784*** |

### *(C) Process B A/c*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Units Introduced | 45,000 | 4,50,000 | By Normal Loss | 900 | 4,500 |
| To Direct Materials | | 65,500 | By Finished Output | 42,000 | 7,51,976 |
| To Labour | | 90,800 | By Abnormal Loss | 300 | 4,740 |
| To Overheads | | 1,80,700 | By WIP Closing | 900 | 25,784 |
| | ***45,000*** | ***7,87,000*** | | ***45,000*** | ***7,87,000*** |

### *Abnormal Loss A/c*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process B A/c | 300 | 4,740 | By Cash @ ₹2 p.u. | 300 | 600 |
| | | | By P/L A/c | | 4,140 |
| | ***300*** | ***4,740*** | | ***300*** | ***4,740*** |

***Working Notes:***

### *Statement of Cost Per Unit*

| Elements | Equivalent Units | Cost of Element | Cost Per Unit |
|---|---|---|---|
| Materials | 44,100 | 4,50,000 + 65,500 - 4,500 = 5,11,000 | ₹11.5873 |
| Labour | 43,140 | 90,800 | ₹2.1048 |
| Overhead | 42,900 | 1,80,700 | ₹4.2121 |
| ***Total Cost Per Unit*** | | | ***₹17.9042*** |

## *PYQ 18*

M J Pvt. Ltd. produces a product "SKY" which passes through two processes, viz. Process A and Process B. The details for the year ending 31st March, 2014 are as follows:

| | *Process A* | *Process B* |
|---|---|---|
| 40,000 units introduced at a cost of | ₹3,60,000 | - |

| | | |
|---|---|---|
| Materials Consumed | ₹2,42,000 | ₹2,25,000 |
| Direct Wages | ₹2,58,000 | ₹1,90,000 |
| Manufacturing Expenses | ₹1,96,000 | ₹1,23,720 |
| Output in Units | 37,000 | 27,000 |
| Normal Wastage of Input | 5% | 10% |
| Scrap Value (per unit) | ₹15 | ₹20 |
| Selling Price (per unit) | ₹37 | ₹61 |

***Additional Information:***

*(a)* 80% of the output of Process A, was passed on to the next process and the balance was sold. The entire output of Process B was sold.

*(b)* Indirect expenses for the year was ₹4,48,080.

*(c)* It is assumed that Process A and Process B are not responsibility centre.

***Required:***

*(i)* Prepare Process A and Process B Account.

*(ii)* Prepare Profit & Loss Account showing the net profit/net loss for the year.

***[(8 Marks) May 2014]***

## *Answer*

### *(i) Process A Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Units Introduced | 40,000 | 3,60,000 | By Normal Loss | 2,000 | 30,000 |
| To Materials Consumed | | 2,42,000 | (5% @ ₹15 per unit) | | |
| To Direct Wages | | 2,58,000 | By Abnormal Loss A/c | 1,000 | 27,000 |
| To Manufacturing Exps | | 1,96,000 | By Process B Account | 29,600 | 7,99,200 |
| | | | By Profit and Loss A/c | 7,400 | 1,99,800 |
| | ***40,000*** | ***10,56,000*** | | ***10,000*** | ***10,56,000*** |

***Normal cost per unit*** $= \frac{\text{Total cost} - \text{scrap of normal loss}}{\text{Total units} - \text{normal loss units}} = \frac{10,56,000 - 30,000}{40,000 - 2,000} =$ ***₹27.00***

### *Process B Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Process A Account | 29,600 | 7,99,200 | By Normal Loss | 2,960 | 59,200 |
| To Materials Consumed | | 2,25,000 | (10% @ ₹20 per unit) | | |
| To Direct Wages | | 1,90,000 | By Profit and Loss A/c | 27,000 | 12,96,000 |
| To Manufacturing Exps | | 1,23,720 | | | |
| To Abnormal Gain | 360 | 17,280 | | | |
| | ***29,960*** | ***13,55,200*** | | ***29,960*** | ***13,55,200*** |

***Normal cost per unit*** $= \frac{\text{Total cost} - \text{scrap of normal loss}}{\text{Total units} - \text{normal loss units}} = \frac{13,37,920 - 59,200}{29,600 - 2,960} =$ ***₹48.00***

### *(ii) Profit and Loss Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Process A A/c | 7,400 | 1,99,800 | By Sales: | | |
| To Process B A/c | 27,000 | 12,96,000 | Process A | 7,400 | 2,73,800 |
| To Indirect Expenses | | 4,48,080 | Process B | 27,000 | 16,47,000 |
| To Abnormal Loss A/c | | 12,000 | By Abnormal Gain A/c | | 10,080 |
| (27,000 – 1,000 units×15) | | | (17,280 – 360 units×20) | | |
| | | | By Net Loss | | 25,000 |
| | ***34,400*** | ***19,55,880*** | | ***34,400*** | ***19,55,880*** |

***PYQ 19***

***The following information relate to process A:***

| | | |
|---|---|---|
| ***(1)*** | Opening work-in process | 8,000 units at ₹75,000 |
| | ***Degree of completion:*** | |
| | Materials | 100% |
| | Labour and Overhead | 60% |
| ***(2)*** | Input 1,82,000 units at | ₹7,37,500 |
| ***(3)*** | Labour paid | ₹3,40,600 |
| ***(4)*** | Overheads incurred | ₹1,70,300 |
| ***(5)*** | Units scrapped | 14,000 |
| | ***Degree of completion:*** | |
| | Material | 100% |
| | Labour and overhead | 80% |
| ***(6)*** | Closing work-in-process | 18,000 units |
| | ***Degree of completion:*** | |
| | Material | 100% |
| | Labour and overhead | 70% |

***(7)*** 1,58,000 units were completed and transferred to next process.

***(8)*** Normal loss is 5% of total input including opening work-in-process

***(9)*** Scrap value is ₹5 per unit to be adjusted out of direct material cost.

***You are required to compute on the basis FIFO method:***

***(a)*** Equivalent production,

***(b)*** Cost per unit.

***(c)*** Value of Units transferred to next process.

***[(8 Marks) Nov 2014]***

## *Answer*

### *(a) Statement of Equivalent Production*

| ***Particulars*** | ***Units*** | ***Materials*** | | ***Labour & OH*** | |
|---|---|---|---|---|---|
| | | ***%*** | ***E. Units*** | ***%*** | ***E. Units*** |
| Opening units: | | | | | |
| Used for Completed Units | 8,000 | - | - | 40 | 3,200 |
| Current Units: | | | | | |
| Used for Completed Units | 1,50,000 | 100 | 1,50,000 | 100 | 1,50,000 |
| Used for Closing WIP | 18,000 | 100 | 18,000 | 70 | 12,600 |
| Normal Loss (1,90,000 × 5%) | 9,500 | - | - | - | - |
| Abnormal Loss | 4,500 | 100 | 4,500 | 80 | 3,600 |
| ***Total*** | ***1,90,000*** | ***-*** | ***1,72,500*** | ***-*** | ***1,69,400*** |

### *(b) Statement of Cost Per Unit*

| ***Elements*** | ***Cost*** | ***Equivalent Units*** | ***Cost Per Unit*** |
|---|---|---|---|
| Materials | 7,37,500 - 47,500 (9,500 × 5) | | |
| Labour | = 6,90,000 | 1,72,500 | 4.0000 |
| Overhead | 3,40,600 | 1,69,400 | 2.0106 |
| | 1,70,300 | 1,69,400 | 1.0053 |
| ***Total Cost Per Unit*** | | | ***7.0159*** |

### *(c) Statement Showing Value Units Transferred to Next Process*

| ***Particulars*** | ***Elements*** | ***Equivalent Units*** | ***Cost Per Unit*** | ***₹*** |
|---|---|---|---|---|
| Current period work | Materials | 1,50,000 | 4.00 | 6,00,000 |
| | Labour and OH | 1,53,200 | 2.0106 + 1.0053 | 4,62,036 |
| ***Add:*** Cost of Opening WIP | | | | 75,000 |
| ***Value of Units Transferred*** | | | | ***11,37,036*** |

**PYQ 20**

The following information is furnished by ABC Company for Process – II of its manufacturing activity for the month of April 2015:

| | | |
|---|---|---|
| **(1)** | Opening work-in process | Nil |
| **(2)** | Units transferred from Process – I | 55,000 units at ₹3,27,800 |
| **(3)** | ***Expenses debited to Process – II:*** | |
| | Consumables | ₹1,57,200 |
| | Labour | ₹1,04,000 |
| | Overheads | ₹52,000 |
| **(4)** | Units transferred to Process – III | 51,000 units |
| **(5)** | Closing WIP | 2,000 units |
| | ***Degree of completion:*** | |
| | Consumables | 80% |
| | Labour | 60% |
| | Overheads | 60% |
| **(6)** | Units scrapped | 2,000 units |
| **(7)** | Scrapped units were sold at | ₹5 per unit |
| **(8)** | Normal loss | 4% of units introduced |

***You are required to***

**(a)** Prepare a Statement of Equivalent Production.
**(b)** Determine the cost per unit.
**(c)** Determine the value of WIP and units transferred to Process – III.

***[(8 Marks) Nov 2015]***

***Answer***

### *(a) Statement of Equivalent Production*

| Particulars | Units | Materials 1 | | Material 2 | | Labour & OH | |
|---|---|---|---|---|---|---|---|
| | | % | E. Units | % | E. Units | % | E. Units |
| Normal Loss (55,000 × 4%) | 2,200 | - | - | - | - | - | - |
| Units transferred to Process - III | 51,000 | 100 | 51,000 | 100 | 51,000 | 100 | 51,000 |
| Units in Closing WIP | 2,000 | 100 | 2,000 | 80 | 1,600 | 60 | 1,200 |
| Less: Abnormal Gain | (200) | 100 | (200) | 100 | (200) | 100 | (200) |
| **Total** | **55,000** | - | **52,800** | - | **52,400** | - | **52,000** |

### *(b) Statement of Cost Per Unit*

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials 1 | 3,27,800 - 11,000 (2,200 × 5) = 3,16,800 | 52,800 | 6.00 |
| Materials 2 | 1,57,200 | 52,400 | 3.00 |
| Labour | 1,04,000 | 52,000 | 2.00 |
| Overhead | 52,000 | 52,000 | 1.00 |
| | | | **12.00** |

### *(c) Statement Showing Value of WIP and Units Transferred to Process – III*

| Particulars | Elements | Equivalent Units | Cost Per Unit | ₹ |
|---|---|---|---|---|
| **1.** Closing WIP | Materials 1 | 2,000 | 6.00 | 12,000 |
| | Materials 2 | 1,600 | 3.00 | 4,800 |
| | Labour | 1,200 | 2.00 | 2,400 |
| | Overheads | 1,200 | 1.00 | 1,200 |
| | | | | **20,400** |
| **2.** Transferred to Process-III | All (M, L, OH) | 51,000 | 12.00 | **6,12,000** |

## PYQ 21

KMR Limited produces product AY, which passes through three processes 'XM', 'YM' and 'ZM'. The output of process 'XM' and 'YM' is transferred to next process at cost plus 20% each on transfer price and the output of process 'ZM' is transferred to finished stock at a profit of 25% on transfer price. The following information are available in respect of the year ending 31st March, 2017:

| Details | Process XM | Process YM | Process ZM | Finished Stock |
|---|---|---|---|---|
| Opening Stock | 30,000 | 54,000 | 80,000 | 90,000 |
| Materials | 1,60,000 | 1,30,000 | 1,00,000 | - |
| Wages | 2,50,000 | 2,16,000 | 1,84,000 | - |
| Manufacturing Overheads | 1,92,000 | 1,44,000 | 1,33,000 | - |
| Closing Stock | 40,000 | 64,000 | 78,000 | 1,00,000 |
| Inter process profit included in Op. Stock | NIL | 8,000 | 20,000 | 40,000 |

Stock in process is valued at prime cost. The finished stock is valued at the price at which it is received from process 'ZM'. Sales of the finished stock during the period was ₹28,00,000.

***You are required to prepare:***

***(i) All process accounts and***

***(ii) Finished Stock A/c showing profit element at each stage.***

***[(8 Marks) May 2017]***

### Answer

***(i) Process XM A/c***

| Particulars | Cost | Profit | Total | Particulars | Cost | Profit | Total |
|---|---|---|---|---|---|---|---|
| Opening Stock | 30,000 | - | 30,000 | Process YM A/c | 5,92,000 | 1,48,000 | 7,40,000 |
| Materials | 1,60,000 | - | 1,60,000 | Closing Stock | 40,000 | - | 40,000 |
| Wages | 2,50,000 | - | 2,50,000 | | | | |
| Prime Cost | 4,40,000 | - | 4,40,000 | | | | |
| Factory OH | 1,92,000 | - | 1,92,000 | | | | |
| Total Cost | 6,32,000 | - | 6,32,000 | | | | |
| Profit | - | 1,48,000 | 1,48,000 | | | | |
| | ***6,32,000*** | ***1,48,000*** | ***7,80,000*** | | ***6,32,000*** | ***1,48,000*** | ***7,80,000*** |

***Process YM A/c***

| Particulars | Cost | Profit | Total | Particulars | Cost | Profit | Total |
|---|---|---|---|---|---|---|---|
| Opening Stock | 46,000 | 8,000 | 54,000 | Process ZM A/c | 10,72,758 | 4,52,242 | 15,25,000 |
| Process XM | 5,92,000 | 1,48,000 | 7,40,000 | | | | |
| Materials | 1,30,000 | - | 1,30,000 | Closing Stock | 55,242 | 8,758 | 64,000 |
| Wages | 2,16,000 | - | 2,16,000 | | | | |
| Prime Cost | 9,84,000 | 1,56,000 | 11,40,000 | | | | |
| Factory OH | 1,44,000 | - | 1,44,000 | | | | |
| Total Cost | 11,28,000 | 1,56,000 | 12,84,000 | | | | |
| Profit | - | 3,05,000 | 3,05,000 | | | | |
| | ***11,28,000*** | ***4,61,000*** | ***15,89,000*** | | ***11,28,000*** | ***4,61,000*** | ***15,89,000*** |

***Profit element in closing stock*** $= \frac{1,56,000}{11,40,000} \times 64,000 =$ ***8,758***

***Process ZM A/c***

| Particulars | Cost | Profit | Total | Particular | Cost | Profit | Total |
|---|---|---|---|---|---|---|---|
| Opening Stock | 60,000 | 20,000 | 80,000 | Finished Stock A/c | 14,91,258 | 11,00,742 | 25,92,000 |
| Process ZM | 10,72,758 | 4,52,242 | 15,25,000 | | | | |
| Materials | 1,00,000 | - | 1,00,000 | Closing Stock | 58,500 | 19,500 | 78,000 |
| Wages | 1,84,000 | - | 1,84,000 | | | | |
| Prime Cost | 14,16,758 | 4,72,242 | 18,89,000 | | | | |
| Factory OH | 1,33,000 | - | 1,33,000 | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total Cost | 15,49,758 | 4,72,242 | 20,22,000 | | | | |
| Profit | - | 6,48,000 | 6,48,000 | | | | |
| | **15,49,758** | **11,20,242** | **26,70,000** | | **15,49,758** | **11,20,242** | **26,70,000** |

***Profit element in closing stock*** $= \dfrac{4,72,242}{18,89,000} \times 78,000 =$ ***19,500***

### *(ii) Finished Stock A/c*

| ***Particulars*** | ***Cost*** | ***Profit*** | ***Total*** | ***Particulars*** | ***Cost*** | ***Profit*** | ***Total*** |
|---|---|---|---|---|---|---|---|
| Opening Stock | 50,000 | 40,000 | 90,000 | Costing P/L A/c | 14,83,725 | 13,16,275 | 28,00,000 |
| Process ZM | 14,91,258 | 11,00,742 | 25,92,000 | | | | |
| Profit | - | 2,18,000 | 2,18,000 | Closing Stock | 57,533 | 42,467 | 1,00,000 |
| | **15,41,258** | **13,58,742** | **29,00,000** | | **15,41,258** | **13,58,742** | **29,00,000** |

***Profit element in closing stock*** $= \dfrac{11,00,742}{25,92,000} \times 1,00,000 =$ ***42,467***

### *PYQ 22*

ABC Ltd. produces an item which is completed in three processes – X, Y and Z. the following information is furnished for the month of March, 2018:

| | |
|---|---|
| Opening work-in process | 5,000 units |
| Materials | ₹35,000 |
| Labour | ₹13,000 |
| Overheads | ₹25,000 |
| Units introduced into process X | 55,000 units |
| Materials | ₹20,20,000 |
| Labour | ₹8,00,000 |
| Overheads | ₹13,30,000 |
| Units scrapped | 5,000 units |
| Degree of completion: | |
| Material | 100% |
| Labour and overhead | 60% |
| Closing work-in-process | 5,000 units |
| Degree of completion: | |
| Material | 100% |
| Labour and overhead | 60% |
| Units finished and transferred to Process Y | 50,000 units |

Normal loss is 5% of total input including opening work-in-process, scrap units fetch ₹20 per unit.

***Presuming average method of inventory is used, prepare:***

***(1)*** Statement of Equivalent production,
***(2)*** Statement of Cost for each element,
***(3)*** Statement of distribution of cost,
***(4)*** Abnormal loss account.

***[(8 Marks) May 2018]***

### *Answer*

#### *(1) Statement of Equivalent Production*

| ***Particulars*** | ***Input*** | ***Particulars*** | ***Output*** | ***Materials*** | | ***Conversion Cost*** | |
|---|---|---|---|---|---|---|---|
| | | | | ***%*** | ***Unit*** | ***%*** | ***Unit*** |
| Opening WIP | 5,000 | Transfer to Process Y | 50,000 | 100 | 50,000 | 100 | 50,000 |
| Fresh Units | 55,000 | Normal Loss (5% of 60,000) | 3,000 | - | - | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Abnormal Loss<br>Closing WIP | 2,000<br>5,000 | 100<br>100 | 2,000<br>5,000 | 60<br>60 | 1,200<br>3,000 |
| ***Total*** | ***60,000*** | ***Total*** | ***60,000*** | - | ***57,000*** | - | ***54,200*** |

### *(2) Statement of Cost*

| *Elements* | *Cost* | *Equivalent Units* | *Cost Per Unit* |
|---|---|---|---|
| Materials | 35,000 + 20,20,000 – 60,000 (3,000 × 20)<br>= 19,55,000 | 57,000 | 35.00 |
| Labour | 13,000 + 8,00,000 = 8,13,000 | 54,200 | 15.00 |
| Overhead | 25,000 + 13,30,000 = 13,55,000 | 54,200 | 25.00 |
| | | | ***75.00*** |

### *(3) Statement of Distribution of Cost*

| *Particulars* | *Elements* | *Equivalent Units* | *Cost Per Unit* | *₹* |
|---|---|---|---|---|
| Units transferred to Process Y | All (M, L, OH) | 50,000 | 75.00 | ***37,50,000*** |
| Abnormal Loss | Materials<br>Labour & OH | 2,000<br>1,200 | 35.00<br>40.00 | 70,000<br>48,000 |
| | | | | ***1,18,000*** |
| Closing WIP | Materials<br>Labour & OH | 5,000<br>3,000 | 35.00<br>40.00 | 1,75,000<br>1,20,000 |
| | | | | ***2,95,000*** |

### *(4) Abnormal Loss A/c*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Process X A/c | 2,000 | 1,18,000 | By Cash @ ₹20 p.u.<br>By P/L A/c | 2,000 | 40,000<br>78,000 |
| | ***2,000*** | ***1,18,000*** | | ***2,000*** | ***1,18,000*** |

### *PYQ 23*

Alpha Ltd. is engaged in the production of a product A which passes through 3 different process – Process P, Process Q and Process R. the following data relating to cost and output is obtained from the books for the month of April, 2017:

| *Particulars* | *Process P* | *Process Q* | *Process R* |
|---|---|---|---|
| Direct Materials | 38,000 | 42,500 | 42,880 |
| Direct Labour | 30,000 | 40,000 | 50,000 |

Production overheads of ₹90,000 were recovered as a percentage of direct labour. 10,000 kg of raw material @ ₹5 per kg. was issued to Process P. There was no stock of material or work in process. There is normal wastage, in processing of 10%. The scrap value of wastage is ₹1 per kg.

The entire output of each process transferred to next process and finally to warehouse as Process P = 9,000 kg, Process Q = 8,200 kg and Process R = 7,300 kg.
The company fixes selling price of the end product in such a way so as to yield a profit of 25% on selling price.

***Prepare Process P, Q and R accounts. Also calculate selling price per unit of end product.***

***[(10 Marks) May 2018]***

### *Answer*

#### *1. Process P Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Input<br>To Direct Materials | 10,000 | 50,000<br>38,000 | By Normal Loss<br>(10% of 10,000 units) | 1,000 | 1,000 |

| | | | | | |
|---|---|---|---|---|---|
| To Direct Labour<br>To Manufacturing OH<br>(75% of 30,000) | | 30,000<br>22,500 | By Process Q Account @<br>₹15.50 per unit | 9,000 | 1,39,500 |
| | ***10,000*** | ***1,40,500*** | | ***10,000*** | ***1,40,500*** |

Cost per unit of completed units = $\frac{\text{Total Cost} - \text{Realisable Value of Normal Loss Units}}{\text{Inputs Units} - \text{Normal Loss Units}}$

= $1,40,500 - 1,000 / 10,000 - 1,000$ = ***₹15.50***

### *2. Process Q Account*

| ***Particulars*** | ***Units*** | ***₹*** | ***Particulars*** | ***Units*** | ***₹*** |
|---|---|---|---|---|---|
| To Process P A/c<br>To Direct Materials<br>To Direct Labour<br>To Manufacturing OH<br>(75% of 40,000)<br>To Abnormal Gain | 9,000<br><br><br><br><br>100 | 1,39,500<br>42,500<br>40,000<br>30,000<br><br>3,100 | By Normal Loss<br>(10% of 9,000 units)<br>By Process R Account @<br>₹31.00 per unit | 900<br><br>8,200 | 900<br><br>2,54,200 |
| | ***9,100*** | ***2,55,100*** | | ***9,100*** | ***2,55,100*** |

Cost per unit of completed units = $2,52,000 - 900 / 9,000 - 900$ = ***₹31.00***

### *3. Process R Account*

| ***Particulars*** | ***Units*** | ***₹*** | ***Particulars*** | ***Units*** | ***₹*** |
|---|---|---|---|---|---|
| To Process Q A/c<br>To Direct Materials<br>To Direct Labour<br>To Manufacturing OH<br>(75% of 50,000) | 8,200 | 2,54,200<br>42,880<br>50,000<br>37,500 | By Normal Loss<br>(10% of 8,200 units)<br>By Abnormal Loss A/c<br>By Finished Goods @<br>₹52.00 per unit | 820<br><br>80<br>7,300 | 820<br><br>4,160<br>3,79,600 |
| | ***8,200*** | ***3,84,580*** | | ***8,200*** | ***3,84,580*** |

Cost per unit of completed units = $3,84,580 - 820 / 8,200 - 820$ = ***₹52.00***

***4. Selling price of end product*** = Cost per unit + Profit @ 25% on Sales or $^1/_3$ on Cost
= $52.00 + 52.00 \times {}^1/_3$ = ***₹69.33***

***Working note:***

Calculation of recovery rate of overheads:

Recovery rate = $\frac{\text{Total Overheads}}{\text{Total Labour Cost}} \times 100$ = $\frac{90,000}{1,20,000} \times 100$

= ***75% of labour cost***

***PYQ 24***

***Following detail have been provided by M/s AR Enterprises:***

- Opening work-in process — 3,000 units (70% complete)
- Units introduced during the year — 17,000 units
- Cost of process (for the period) — ₹33,12,720
- Transferred to next process — 15,000 units
- Closing work-in-process — 2,200 units (80 complete)
- Normal loss is estimated at 12% of total input including opening work-in-process
- Scrap realize — ₹50 per unit (100% complete)

***Using FIFO method, compute:***

***(1)*** Equivalent production,
***(2)*** Cost per equivalent unit.

***[(5 Marks) Nov 2018]***

**Answer**

**(1) Statement of Equivalent Production**

| Particulars | Units | Materials, Labour & OH | |
|---|---|---|---|
| | | % | E. Units |
| Opening Units: | | | |
| Used to produce Units transferred to Next Process | 3,000 | 30 | 900 |
| Current Units: | | | |
| Used to produce Units transferred to Next Process | 12,000 | 100 | 12,000 |
| Normal loss (12% of 20,000) | 2,400 | - | - |
| Abnormal loss (3,000 + 17,000 – 2,400 - 15,000 – 2,200) | 400 | 100 | 400 |
| Closing WIP | 2,200 | 80 | 1,760 |
| **Total** | **20,000** | **-** | **15,060** |

**(2) Statement of Cost Per Equivalent Unit**

| Elements | Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials, Labour and Overheads | 33,12,720 – 2,400 × 50 = 31,92,720 | 15,060 | **212.00** |

**PYQ 25**

A company manufacturing chemical solution that passes through a number of processes uses FIFO method to value WIP and Finished goods. At the end of the month of September, a fire occurred in the factory and some papers containing records of the process operations for the month were destroyed. The company desires to prepare process account for the month during which the fire occurred. Some information could be gathered as to operating activities as under:

- Opening work-in process at the beginning of the month of 1,100 litres, 40% complete for labour and 60% for overheads. Opening WIP was valued at ₹48,260.
- Closing WIP at the end of the month was 220 litres, 40% complete for labour and 30% for overheads.
- Normal loss is 10% of input and total losses during the month were 2,200 litres partly due to fire damage. Assume degree of completion of abnormal loss is 100%.
- Output sent to Finished goods warehouse was 5,900 litres.
- Losses have a scrap value of ₹20 per litre.
- All raw materials are added at the commencement of the process.
- The cost per equivalent unit (litre) is ₹53 for the month consisting:

| | |
|---|---|
| Raw materials | ₹35 |
| Labour | ₹8 |
| Overheads | ₹10 |
| Total | **₹53** |

**You are required to:**

**(1)** Calculate the quantity (in litres) of raw materials input during the month.
**(2)** Calculate the quantity (in litres) of normal loss and abnormal loss/gain experienced in the month.
**(3)** Calculate the value of raw materials, labour and overheads added to the process during the month.
**(4)** Prepare process account for the month.

**[(8 Marks) Nov 2018]**

**Answer**

**(1) Calculation of quantity of raw materials input during the month:**

Raw materials input = Output of Finished goods + Closing WIP + Losses – Opening WIP
= 5,900 + 220 + 2,200 – 1,100 = **7,220 litres**

**(2) Calculation of quantity of normal loss and abnormal loss or gain:**

Normal loss = 10% of Input = 10% of 7,220 = **722 litres**
Abnormal loss = Actual loss – Normal loss

= 2,200 – 722 = **1,478 litres**

### (3) Statement of Material, Labour and Overheads added during the month

| Particulars | Materials | Labour | Overheads |
|---|---|---|---|
| Cost per equivalent units | 35 | 8 | 10 |
| Number of equivalent units | 6,498 | 7,026 | 6,784 |
| Cost of equivalent units | 2,27,430 | 56,208 | 67,840 |
| Add: Scrap value of normal loss units (722 × 20) | 14,440 | - | - |
| **Total value added** | **2,41,870** | **56,208** | **67,840** |

### (4) Process A/c

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Opening WIP | 1,100 | 48,260 | By Normal Loss | 722 | 14,440 |
| To Materials | 7,220 | 2,41,870 | By Finished Output | 5,900 | 3,12,340 |
| To Labour | | 56,208 | By Abnormal Loss | 1,478 | 78,334 |
| To Overheads | | 67,840 | By WIP Closing | 220 | 9,064 |
| | **8,320** | **4,14,178** | | **8,320** | **4,14,178** |

**Working Note:**

### (a) Statement of Equivalent Production

| Particulars | Units | Materials | | Labour | | Overheads | |
|---|---|---|---|---|---|---|---|
| | | % | E. Units | % | E. Units | % | E. Units |
| Opening Units: | | | | | | | |
| Used for Completed Units | 1,100 | - | - | 60 | 660 | 40 | 440 |
| Current Units: | | | | | | | |
| Used for Completed Units | 4,800 | 100 | 4,800 | 100 | 4,800 | 100 | 4,800 |
| Normal loss | 722 | - | - | - | - | - | - |
| Abnormal loss | 1,478 | 100 | 1,478 | 100 | 1,478 | 100 | 1,478 |
| Closing WIP | 220 | 100 | 220 | 40 | 88 | 30 | 66 |
| **Total** | **8,320** | **-** | **6,498** | **-** | **7,026** | **-** | **6,784** |

### (b) Statement of Evaluation

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Completed: | | | | |
| Current period cost | Materials | 4,800 | 35 | 1,68,000 |
| | Labour | 5,460 | 8 | 43,680 |
| | Overheads | 5,240 | 10 | 52,400 |
| Add: Cost of Opening WIP | | | | 48,260 |
| | | | | **3,12,340** |
| Abnormal Loss | All | 1,478 | 53 | **78,334** |
| Closing WIP | Materials | 220 | 35 | 7,700 |
| | Labour | 88 | 8 | 704 |
| | Overheads | 66 | 10 | 660 |
| | | | | **9,064** |

**PYQ 26**

KT Ltd. produces a product EMM which passes through two processes before it is completed and transferred to finished stock. The following data relate to May 2019:

| Particulars | Process | | Finished Stock |
|---|---|---|---|
| | A (₹) | B (₹) | (₹) |
| Opening Stock | 5,000 | 5,500 | 10,000 |
| Direct Materials | 9,000 | 9,500 | |
| Direct Wages | 5,000 | 6,000 | |
| Factory Overheads | 4,600 | 2,030 | |

| | | | |
|---|---|---|---|
| Closing Stock | 2,000 | 2,490 | 5,000 |
| Inter-process profit included in opening stock | - | 1,000 | 4,000 |

Output of Process A is transferred to Process B at 25% profit on the transfer price and output of Process B is transferred to finished stock at 20% profit on the transfer price. Stock in process is valued at prime cost. Finished stock is valued at the price at which it is received from Process B. Sales during the period are ₹75,000.

***Prepare the Process cost accounts and Finished stock account showing the profit element at each stage.***

***[(10 Marks) May 2019]***

## *Answer*

***Process A A/c***

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Opening Stock | 5,000 | 5,000 | - | Process B A/c | 28,800 | 21,600 | 7,200 |
| Materials | 9,000 | 9,000 | - | Closing Stock | 2,000 | 2,000 | - |
| Wages | 5,000 | 5,000 | - | | | | |
| Prime Cost | 19,000 | 19,000 | - | | | | |
| Factory OH | 4,600 | 4,600 | - | | | | |
| Process Cost | 23,600 | 23,600 | - | | | | |
| Profit | 7,200 | - | 7,200 | | | | |
| | ***30,800*** | ***23,600*** | ***7,200*** | | ***30,800*** | ***23,600*** | ***7,200*** |

***Process B A/c***

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Opening Stock | 5,500 | 4,500 | 1,000 | Finished Stock A/c | 61,675 | 41,550 | 20,125 |
| Process A A/c | 28,800 | 21,600 | 7,200 | Closing Stock | 2,490 | 2,080 | 410 |
| Materials | 9,500 | 9,500 | - | | | | |
| Wages | 6,000 | 6,000 | - | | | | |
| Prime Cost | 49,800 | 41,600 | 8,200 | | | | |
| Factory OH | 2,030 | 2,030 | - | | | | |
| Process Cost | 51,830 | 43,630 | 8,200 | | | | |
| Profit | 12,335 | - | 12,335 | | | | |
| | ***64,165*** | ***43,630*** | ***20,535*** | | ***64,165*** | ***43,630*** | ***20,535*** |

***Finished Stock A/c***

| Particulars | Total | Cost | Profit | Particulars | Total | Cost | Profit |
|---|---|---|---|---|---|---|---|
| Opening Stock | 10,000 | 6,000 | 4,000 | Costing P & L A/c | 75,000 | 44,189 | 30,818 |
| Process B A/c | 61,675 | 41,550 | 20,125 | Closing Stock | 5,000 | 3,361 | 1,632 |
| Profit (b.f.) | 8,325 | - | 8,325 | | | | |
| | ***80,000*** | ***47,550*** | ***32,450*** | | ***80,000*** | ***47,550*** | ***32,450*** |

**** Stock reserve in closing stock of Process B*** = $^{8,200}/_{49,800} \times 2,490$ = ***410***

**** Stock reserve in closing stock of FG*** = $^{20,125}/_{61,675} \times 5,000$ = ***1,632***

## *PYQ 27*

A product passes through two distinct processes before completion. Following information are available in this respect:

| | *Process 1* | *Process 2* |
|---|---|---|
| Raw materials used | 10,000 units | - |
| Raw material cost (per unit) | ₹75 | - |
| Transfer to next process/Finished goods | 9,000 units | 8,200 units |
| Normal loss (on inputs) | 5% | 10% |
| Direct wages | ₹3,00,000 | ₹5,60,000 |
| Direct expenses | 50% of direct wages | 65% of direct wages |
| Manufacturing overheads | 25% of direct wages | 15% of direct wages |
| Realisable value of scrap (per unit) | ₹13.50 | ₹145 |

8,000 units of finished goods were sold at a profit of 15% on cost. There was no opening and closing stock of work-in-progress.

***Prepare:***

(1) Process 1 and process 2 account
(2) Finished goods account
(3) Normal loss account
(4) Abnormal loss account
(5) Abnormal gain account

*[(10 Marks) Nov 2019]*

## Answer

### (1) Process 1 Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Raw Materials | 10,000 | 7,50,000 | By Normal Loss A/c (5% @ ₹13.50 per unit) | 500 | 6,750 |
| To Direct Wages | | 3,00,000 | By Process 2 A/c @ ₹133.50 per unit | 9,000 | 12,01,500 |
| To Direct Expenses (50% of Direct Wages) | | 1,50,000 | By Abnormal Loss A/c @ ₹133.50 per unit | 500 | 66,750 |
| To Manufacturing OH (25% of Direct Wages) | | 75,000 | | | |
| | **10,000** | **12,75,000** | | **10,000** | **12,75,000** |

$$NCPU = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{12,75,000 - 6,750}{10,000 - 500} = ₹133.50 \text{ p.u.}$$

### Process 2 Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process 1 A/c | 9,000 | 12,01,500 | By Normal Loss A/c (10% @ ₹145 per unit) | 900 | 1,30,500 |
| To Direct Wages | | 5,60,000 | By Finished Goods A/c @ ₹256.67 per unit | 8,200 | 21,04,667 |
| To Direct Expenses (65% of Direct Wages) | | 3,64,000 | | | |
| To Manufacturing OH (15% of Direct Wages) | | 84,000 | | | |
| To Abnormal Gain A/c @ ₹256.67 per unit | 100 | 25,667 | | | |
| | **9,100** | **22,35,167** | | **9,100** | **22,35,167** |

$$NCPU = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{22,09,500 - 1,30,500}{9,000 - 900} = ₹256.67 \text{ p.u.}$$

### (2) Finished Goods Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process 2 A/c | 8,200 | 21,04,667 | By Cost of Sales | 8,000 | 20,53,333 |
| | | | By Balance c/d | 200 | 51,334 |
| | **8,200** | **21,04,667** | | **8,200** | **21,04,667** |

### (3) Normal Loss Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process 1 A/c | 500 | 6,750 | By Cash A/c: | | |
| To Process 2 A/c | 900 | 1,30,500 | Process 1 | 500 | 6,750 |
| | | | Process 2 | 800 | 1,16,000 |
| | | | By Abnormal Gain A/c | 100 | 14,500 |
| | **1,400** | **1,37,250** | | **1,400** | **1,37,250** |

### (4) Abnormal Loss Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process 1 A/c | 500 | 66,750 | By Cash A/c | 500 | 6,750 |
| | | | By Costing P/L A/c | | 60,000 |
| | **500** | **66,750** | | **500** | **66,750** |

### (5) Abnormal Gain Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Normal Loss A/c | 100 | 14,500 | By Process 2 A/c | 100 | 25,667 |
| To Costing P/L A/c | | 11,167 | | | |
| | **100** | **25,667** | | **100** | **25,667** |

## PYQ 28

Following details are related to the work done in Process I by ABC Ltd. during the month of May, 2019:

| | |
|---|---|
| Opening work-in-progress | 3,000 units |
| Materials | ₹1,80,500 |
| Labour | ₹32,400 |
| Overheads | ₹90,000 |
| Materials introduced in Process I | 42,000 units |
| Materials | ₹36,04,000 |
| Direct labour | ₹4,50,000 |
| Overheads | ₹15,18,000 |
| Units scrapped | 4,800 units |
| ***Degree of completion:*** | |
| Materials | 100% |
| Labour and overheads | 70% |
| Closing work-in-progress | 4,200 units |
| ***Degree of completion:*** | |
| Materials | 100% |
| Labour and overhead | 50% |
| Units finished and transferred to Process II | 36,000 units |

***Normal loss:***

4% of total input including opening work-in-progress
Scrapped units fetch ₹62.50 per piece.

***Prepare:***

1. Statement of equivalent production,
2. Statement of cost per equivalent unit,
3. Process I Account,
4. Normal Loss Account and,
5. Abnormal Loss Account.

***[(10 Marks) Nov 2020]***

## Answer

### 1. Statement of Equivalent Production (Average Cost Method)

| Particulars | Total Units | Materials | | Processing Cost | |
|---|---|---|---|---|---|
| | | % | Unit | % | Unit |
| Units Completed | 36,000 | 100 | 36,000 | 100 | 36,000 |
| Normal loss | 1,800 | - | - | - | - |
| Abnormal Loss | 3,000 | 100 | 3,000 | 70 | 2,100 |
| Closing WIP | 4,200 | 100 | 4,200 | 50 | 2,100 |
| **Total** | **45,000** | **-** | **43,200** | **-** | **40,200** |

### 2. Statement of Cost per Equivalent Unit

| Elements | Total Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 1,80,500 + 36,04,000 – 1,12,500 = 36,72,000 | 43,200 | 85.00 |
| Labour | 32,400 + 4,50,000 = 4,82,400 | 40,200 | 12.00 |
| Overheads | 90,000 + 15,18,000 = 16,08,000 | 40,200 | 40.00 |
| | | | ***137.00*** |

### 3. Process I Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Opening WIP | 3,000 | 3,02,900 | By Normal Loss | 1,800 | 1,12,500 |
| To Direct Materials | 42,000 | 36,04,000 | By Process II A/c | 36,000 | 49,32,000 |
| To Direct Labour | | 4,50,000 | By Abnormal Loss A/c | 3,000 | 3,64,200 |
| To Overhead | | 15,18,000 | By Closing WIP | 4,200 | 4,66,200 |
| | ***45,000*** | ***58,74,900*** | | ***45,000*** | ***58,74,900*** |

### 4. Normal Loss Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process I A/c | 1,800 | 1,12,500 | By Cash A/c | 1,800 | 1,12,500 |
| | ***1,800*** | ***1,12,500*** | | ***1,800*** | ***1,12,500*** |

### 5. Abnormal Loss Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process I A/c | 3,000 | 3,64,200 | By Cash A/c | 3,000 | 1,87,500 |
| | | | By Costing P/L A/c | | 1,76,700 |
| | ***3,000*** | ***3,64,200*** | | ***3,000*** | ***3,64,200*** |

***Working note:***

### Statement of Evaluation

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units Completed | Materials, Labour, Overheads | 36,000 | 137.00 | ***49,32,000*** |
| Abnormal Loss | Materials | 3,000 | 85.00 | 2,55,000 |
| | Labour, Overheads | 2,100 | 12.00 + 40.00 | 1,09,200 |
| | | | | ***3,64,200*** |
| Closing WIP | Materials | 4,200 | 85.00 | 3,57,000 |
| | Labour, Overheads | 2,100 | 12.00 + 40.00 | 1,09,200 |
| | | | | ***4,66,200*** |

***PYQ 29***

***MNO Ltd has provided following details:***

- Opening work in progress is 10,000 units at ₹50,000 (Material 100%, Labour and overheads 70% complete).
- Input of materials is 55,000 units at ₹2,20,000. Amount spent on Labour and Overheads is ₹26,500 and ₹61,500 respectively.
- 9,500 units were scrapped; degree of completion for material 100% and for labour & overheads 60%.
- Closing work in progress is 12,000 units; degree of completion for material 100% and for labour & overheads 90%.
- Finished units transferred to next process are 43,500 units.
- Normal loss is 5% of total input including opening work in progress. Scrapped units would fetch ₹8.50 per unit.

***You are required to prepare using FIFO method:***

***(1)*** Statement of Equivalent production
***(2)*** Abnormal Loss Account

***[(5 Marks) Jan 2021]***

## Answer

### (1) Statement of Equivalent Production (FIFO Method)

| Particulars | Units | Materials | | Labour & Overheads | |
|---|---|---|---|---|---|
| | | % | E. Units | % | E. Units |
| Opening Units: | | | | | |
| Used for Completed Units | 10,000 | - | - | 30 | 3,000 |
| Current Units: | | | | | |
| Used for Completed Units | 33,500 | 100 | 33,500 | 100 | 33,500 |
| Normal loss (5% of 65,000) | 3,250 | - | - | - | - |
| Abnormal loss | 6,250 | 100 | 6,250 | 60 | 3,750 |
| Closing WIP | 12,000 | 100 | 12,000 | 90 | 10,800 |
| ***Total*** | ***65,000*** | ***-*** | ***51,750*** | ***-*** | ***51,050*** |

### (2) Abnormal Loss Account

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process A/c | 6,250 | 29,698 | By Cash A/c | 6,250 | 53,125 |
| To Costing P/L A/c | | 23,427 | | | |
| | ***6,250*** | ***53,125*** | | ***6,250*** | ***53,125*** |

***Working notes:***

### (a) Statement of Cost per Equivalent Unit

| Elements | Total Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 2,20,000 – (3,250 × 8.50) = 1,92,375 | 51,750 | 3.7174 |
| Labour | 26,500 | 51,050 | 0.5191 |
| Overheads | 61,500 | 51,050 | 1.2047 |
| | | | ***5.4412*** |

***(b) Valuation of Abnormal loss*** = (6,250 × 3.7174) + [3,750 × (0.5191 + 1.2047)]
= ***29,698***

## PYQ 30

A manufacturing unit manufactures a product 'XYZ' which passes through three Processes: X, Y and Z. the following data is given:

| Particulars | Process X | Process Y | Process Z |
|---|---|---|---|
| Material consumed (in ₹) | 2,600 | 2,250 | 2,000 |
| Direct wages (in ₹) | 4,000 | 3,500 | 3,000 |

***(a)*** The total production overhead of ₹15,750 was recovered @150% of direct wages.
***(b)*** 15,000 units at ₹2 each were introduced to process 'X'.
***(c)*** The output of each process passes to the next process and finally, 12,000 units were transferred finished stock account from process 'Z'.
***(d)*** No stock of materials or work in progress were left at the end.

The following additional information if given:

| Process | % of wastage to normal input | Value of scrap per unit (₹) |
|---|---|---|
| X | 6% | 1.10 |
| Y | ? | 2.00 |
| Z | 5% | 1.00 |

***You are required to:***

***(1)*** Find out the percentage of wastage in process 'Y' given that the output of process 'Y' is transferred to process 'Z' at ₹4 per unit.

***(2)*** Prepare process accounts for all the three processes X, Y and Z.

***[(10 Marks) July 2021]***

## *Answer*

### *(1) Calculation of percentage of wastage in process Y:*

Let scrap units in process Y be 'x'

Cost per unit in process Y = $\frac{\text{Total cost – sale of scrap}}{\text{total units – Normal loss units}}$ = $\frac{52{,}610 - 2x}{14{,}100 - x}$ = ₹4

$4 (14{,}100 - x) = 52{,}610 - 2x$

$56{,}400 - 4x = 52{,}610 - 2x$

$3{,}790 = 2x$

$x = 3{,}790 \div 2 = 1{,}895$ units

Percentage of wastage = $(1{,}895 \div 14{,}100) \times 100$ = 13.44%

### *(2) Process X Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Units introduced | 15,000 | 30,000 | By Normal Loss (6% of 15,000 units) | 900 | 990 |
| To Material consumed | | 2,600 | By Process Y Account | 14,100 | 41,610 |
| To Direct wages | | 4,000 | | | |
| To Production overheads (150% of 4,000) | | 6,000 | | | |
| | ***15,000*** | ***42,600*** | | ***15,000*** | ***42,600*** |

### *Process Y Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process X A/c | 14,100 | 41,610 | By Normal Loss | 1,895 | 3,790 |
| To Material consumed | | 2,250 | By Process Z Account @₹4 per unit | 12,205 | 48,820 |
| To Direct wages | | 3,500 | | | |
| To Production overheads (150% of 3,500) | | 5,250 | | | |
| | ***14,100*** | ***52,610*** | | ***14,100*** | ***52,610*** |

### *Process Z Account*

| Particulars | Units | ₹ | Particulars | Units | ₹ |
|---|---|---|---|---|---|
| To Process Y A/c | 12,205 | 48,820 | By Normal Loss (5% of 12,205 units) | 610 | 610 |
| To Material consumed | | 2,000 | By Finished stock Account @ ₹4.977 per unit | 12,000 | 59,725 |
| To Direct wages | | 3,000 | | | |
| To Production overheads (150% of 3,000) | | 4,500 | | | |
| To Abnormal gain @ ₹4.977 per unit | 405 | 2,015 | | | |
| | ***12,610*** | ***60,335*** | | ***12,610*** | ***60,335*** |

Cost per unit = $\frac{\text{Total cost – sale of scrap}}{\text{total units – Normal loss units}}$ = $\frac{58{,}320 - 610}{12{,}205 - 610}$ = ***₹4.977 per unit***

## *PYQ 31*

A product passes through Process-I and Process-II. Particulars pertaining to the Process I are: Materials issued to Process I amounted to ₹80,000, Wages ₹60,000 and manufacturing overheads were ₹52,500. Normal Loss anticipated was 5% of input. 9,650 units of output were produced and transferred out from Process I to

Process II. Input raw materials issued to Process I were 10,000 units. There were no opening stocks. Scrap has realizable value of ₹5 per unit.

***You are required to prepare:***

***1.*** Process I Account
***2.*** Abnormal Gain Account

***[(5 Marks) Dec 2021]***

## *Answer*

### *1. Process I Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Raw Material Issued | 10,000 | 80,000 | By Normal Loss A/c (5% @ ₹5 per unit) | 500 | 2,500 |
| To Wages | | 60,000 | By Process II A/c @ ₹20 per unit | 9,650 | 1,93,000 |
| To Manufacturing OH | | 52,500 | | | |
| To Abnormal Gain A/c @ ₹20 per unit | 150 | 3,000 | | | |
| | ***10,150*** | ***1,95,500*** | | ***10,150*** | ***1,95,500*** |

$$NCPU = \frac{\text{Total Cost} - \text{Sale value of Normal Loss Units}}{\text{Total Units} - \text{Normal Loss Units}} = \frac{1{,}92{,}500 - 2{,}500}{10{,}000 - 500} = ₹20 \text{ per unit}$$

### *2. Abnormal Gain Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Normal Loss A/c | 150 | 750 | By Process I A/c | 150 | 3,000 |
| To Costing P/L A/c | | 2,250 | | | |
| | ***150*** | ***3,000*** | | ***150*** | ***3,000*** |

## *PYQ 32*

STG Limited is a manufacturer of Chemical 'GK', which is required for industrial use. The complete production operation requires two processes. The raw material first passes through Process I, where Chemical 'G' is produced. Following data is furnished for the month April 2022:

| *Particulars* | *(in kgs.)* |
|---|---|
| Opening work-in-progress quantity (Material 100% and conversion 50% complete) | 9,500 |
| Material input quantity | 1,05,000 |
| Work Completed quantity | 83,000 |
| Closing work-in-progress quantity (Material 100% and conversion 60% complete) | 16,500 |

***You are further provided that:***

| *Particulars* | *(in ₹)* |
|---|---|
| Opening work-in-progress cost: | |
| Material cost | 29,500 |
| Processing cost | 14,750 |
| Material input cost | 3,34,500 |
| Processing cost | 2,53,100 |

Normal process loss may be estimated to be 10% of material input. It has no realizable value. Any loss over and above normal loss is considered to be 100% complete in material and processing.

The Company transfers 60,000 kgs. of output (Chemical G) from Process I to Process II for producing Chemical 'GK'. Further materials are added in Process II which yield 1.20 kg. of Chemical 'GK' for every kg. of Chemical 'G' introduced. The chemicals transferred to Process II for further processing are then sold as Chemical 'GK' for ₹10 per kg. Any quantity of output completed in Process I, are sold as Chemical 'G' @ ₹9 per kg.

The monthly costs incurred in Process II (other than the cost of Chemical 'G') are:

Input 60,000 kg. of Chemical 'G':

Materials Cost ₹85,000

Processing Costs ₹50,000

***You are required:***

***(a)*** Prepare Statement of Equivalent production and determine the cost per kg. of Chemical 'G' in Process I using the weighted average cost method.

***(b)*** Prepare a statement showing cost of Chemical 'G' transferred to Process II, cost of abnormal loss and cost of closing work-in progress.

***(c)*** STG is considering the option to sell 60,000 kg. of Chemical 'G' of Process I without processing it further in Process-II. Will it be beneficial for the company over the current pattern of processing 60,000 kg in process-II?

***[(10 Marks) May 2022]***

## *Answer*

### *(a) Statement of Equivalent Production (Average Cost Method)*

| Particulars | Units | Materials | | Processing Cost | |
|---|---|---|---|---|---|
| | | % | Unit | % | Unit |
| Units Completed | 83,000 | 100 | 83,000 | 100 | 83,000 |
| Normal loss (10% of 10,500) | 10,500 | - | - | - | - |
| Closing WIP | 16,500 | 100 | 16,500 | 60 | 9,900 |
| Abnormal Loss<br>(9,500 + 1,05,000 -83,000 – 16,500 – 10,500) | 4,500 | 100 | 4,500 | 100 | 4,500 |
| ***Total*** | ***1,14,500*** | - | ***1,04,000*** | - | ***97,400*** |

### *Statement of Cost per Equivalent Unit*

| Elements | Total Cost | Equivalent Units | Cost Per Unit |
|---|---|---|---|
| Materials | 29,500 + 3,34,500 = 3,64,000 | 1,04,000 | 3.50 |
| Processing Cost | 14,750 + 2,53,100 = 2,67,850 | 97,400 | 2.75 |
| | | | ***6.25*** |

### *(b) Statement Showing Cost of Chemical 'G' transferred to Process II, Cost of Abnormal Loss and Cost of Closing work-in progress*

| Particulars | Elements | Eq. Units | Cost Per Unit | Total |
|---|---|---|---|---|
| Units transferred (60,000 units) | All | 60,000 | 6.25 | ***3,75,000*** |
| Abnormal Loss | All | 4,500 | 6.25 | ***28,125*** |
| Closing WIP | Materials | 16,500 | 3.50 | 57,750 |
| | Processing Cost | 9,900 | 2.75 | 27,225 |
| | | | | ***84,975*** |

### *(c) Further Processing Decision:*

| Incremental revenue | Incremental cost | Situation | Decision |
|---|---|---|---|
| (60,000 × 1.2 kgs × ₹10) – (60,000 × ₹9)<br>= ₹1,80,000 | ₹85,000 + ₹50,000<br>= ₹1,35,000 | IR > IC | Yes |

***Advise:*** Additional net profit on further processing in Process II is 45,000 (1,80,000 – 1,35,000). Therefore, it is advisable to process further chemical 'G'.

## *PYQ 33*

N Ltd. produces a product which passes through two processes – Process-I and Process-II. The company has provided following information related to the Financial Year 2021-22.

| Particulars | Process-I | Process-II |
|---|---|---|

| | | |
|---|---|---|
| Raw Material @ ₹65 per unit | 6,500 units | - |
| Direct Wages | ₹1,40,000 | ₹1,30,000 |
| Direct Expenses | 30% of Direct wages | 35% of Direct wages |
| Manufacturing Overheads | ₹21,500 | ₹24,500 |
| Realisable value of scrap per unit | ₹4.00 | ₹16.00 |
| Normal Loss | 250 units | 500 units |
| Units transferred to Process II / finished stock | 6,000 units | 5,500 units |
| Sales | - | 5,000 units |

There was no opening or closing stock of work-in-progress.

***You are required to prepare:***

***(a)*** Process-I Account

***(b)*** Process-II Account

***(c)*** Finished Stock Account

***[(10 Marks) Nov 2022]***

## *Answer*

### *(a) Process-I Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Raw Materials used | 6,500 | 4,22,500 | By Normal Loss | 250 | 1,000 |
| To Direct Wages | | 1,40,000 | By Process-II Account @ ₹100 per unit | 6,000 | 6,00,000 |
| To Direct Expenses (30% of ₹1,40,000) | | 42,000 | By Abnormal Loss A/c @ ₹100 per unit | 250 | 25,000 |
| To Manufacturing OH | | 21,500 | | | |
| | ***6,500*** | ***6,26,000*** | | ***6,500*** | ***6,26,000*** |

$$NCPU = \frac{\text{Total Cost} - \text{Realisable Value of Normal Loss Units}}{\text{Inputs Units} - \text{Normal Loss Units}} = \frac{6,26,000 - 1,000}{6,500 - 250} = ₹100 \text{ p.u.}$$

### *(b) Process-II Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Process-I A/c | 6,000 | 6,00,000 | By Normal Loss | 500 | 8,000 |
| To Direct Wages | | 1,30,000 | By Finished Stock A/c @ ₹144 per unit | 5,500 | 7,92,000 |
| To Direct Expenses (35% of ₹1,30,000) | | 45,500 | | | |
| To Manufacturing OH | | 24,500 | | | |
| | ***6,000*** | ***8,00,000*** | | ***6,000*** | ***8,00,000*** |

$$NCPU = \frac{\text{Total Cost} - \text{Realisable Value of Normal Loss Units}}{\text{Inputs Units} - \text{Normal Loss Units}} = \frac{8,00,000 - 8,000}{6,000 - 500} = ₹144 \text{ p.u.}$$

### *(c) Finished Stock Account*

| *Particulars* | *Units* | *₹* | *Particulars* | *Units* | *₹* |
|---|---|---|---|---|---|
| To Process-II A/c | 5,500 | 7,92,000 | By COS @ ₹144 per unit | 5,000 | 7,20,000 |
| | | | By Balance c/d | 500 | 72,000 |
| | ***5,500*** | ***7,92,000*** | | ***5,500*** | ***7,92,000*** |

# SUGGESTED REVISION

| Ques. No. | Observations or KEY Points (Note down during revisions) | Page No. of Practical Register | 1st & 2nd Revision | 3rd, 4th & 5th Revision | Revision during Exams |
|---|---|---|---|---|---|
| BQ (Book Questions covering Study Module of ICAI, PM, RTP's, MTP's and Important Questions) | | | | | |
| 1 | | | Y | Y | Y |
| 2 | | | Y | - | - |
| 3 | | | Y | - | - |
| 4 | | | Y | Y | Y |
| 5 | | | Y | Y | Y |
| 6 | | | Y | Y | Y |
| 7 | | | Y | Y | Y |
| 8 | | | Y | Y | Y |
| 9 | | | Y | Y | Y |
| 10 | | | Y | - | - |
| 11 | | | Y | Y | Y |
| 12 | | | Y | - | - |
| 13 | | | Y | Y | Y |
| 14 | | | Y | - | - |
| 15 | | | Y | Y | Y |
| 16 | | | Y | - | - |
| 17 | | | Y | - | - |
| 18 | | | Y | Y | - |
| 19 | | | Y | Y | Y |
| 20 | | | Y | Y | Y |
| 21 | | | Y | - | - |
| 22 | | | Y | - | - |
| 23 | | | Y | Y | Y |
| 24 | | | Y | Y | - |
| 25 | | | Y | Y | Y |
| 26 | | | Y | - | - |
| 27 | | | Y | - | - |
| 28 | | | Y | Y | Y |
| 29 | | | Y | Y | Y |
| 30 | | | Y | - | - |
| 31 | | | Y | - | - |
| 32 | | | Y | Y | Y |
| PYQ (Past Year Questions) | | | | | |
| 1 | | | Y | Y | - |
| 2 | | | Y | - | - |
| 3 | | | Y | Y | Y |
| 4 | | | Y | - | - |
| 5 | | | Y | Y | Y |
| 6 | | | Y | - | - |
| 7 | | | Y | Y | - |
| 8 | | | Y | - | - |
| 9 | | | Y | Y | - |
| 10 | | | Y | - | - |
| 11 | | | Y | - | - |
| 12 | | | Y | Y | Y |
| 13 | | | Y | Y | Y |
| 14 | | | Y | - | - |
| 15 | | | Y | Y | - |

| | | | | | |
|---|---|---|---|---|---|
| 16 | | | Y | - | - |
| 17 | | | Y | - | - |
| 18 | | | Y | Y | Y |
| 19 | | | Y | - | - |
| 20 | | | Y | - | - |
| 21 | | | Y | Y | - |
| 22 | | | Y | - | - |
| 23 | | | Y | - | - |
| 24 | | | Y | - | - |
| 25 | | | Y | Y | Y |
| 26 | | | Y | - | - |
| 27 | | | Y | Y | - |
| 28 | | | Y | Y | Y |
| 29 | | | Y | Y | Y |
| 30 | | | Y | Y | Y |
| 31 | | | Y | - | - |
| 32 | | | Y | Y | - |
| 33 | | | Y | - | - |

# *CHAPTER - 10*

# *JOINT PRODUCTS & BY PRODUCTS*

## *LEARNING OBJECTIVES*

***When you have finished studying this chapter, you should be able to***

- ***Discuss the meaning of Joint products and By-products.***
- ***Differentiate between Joint products and By-products.***
- ***Discuss the various methods of apportionment of joint costs to Joint products and to By-products.***
- ***State the treatment of By-product's cost in cost accounting.***

# *METHODS OF APPORTIONMENT OF JOINT COST*

### *BQ 1*

A coke manufacturing company produces the following products by using 5,000 tonnes of coal @ ₹1,100 per ton into a common process.

| | |
|---|---|
| Coke | 3,500 tonnes |
| Tar | 1,200 tonnes |
| Sulphate of ammonia | 52 tonnes |
| Benzol | 48 tonnes |

***Apportion the joint cost amongst the products on the basis of the physical unit method.***

### *Answer*

***Statement Showing Apportionment of Joint Cost***

| *Particulars* | *Coke* | *Tar* | *Ammonia* | *Benzol* |
|---|---|---|---|---|
| Number of units (Quantity in Tonnes) | 3,500 | 1,200 | 52 | 48 |
| ***Apportionment of Joint Cost (₹55,00,000 in proportion of units)*** | ***₹40,10,417*** | ***₹13,75,000*** | ***₹59,583*** | ***₹55,000*** |

### *BQ 2*

***Find out cost of joint products A, B and C using average unit cost method from the following data:***

| | |
|---|---|
| Pre-separation Joint Cost | ₹60,000 |

***Production data:***

| *Products* | *Unit Produced* |
|---|---|
| A | 500 |
| B | 200 |
| C | 300 |
| | ***1,000*** |

### *Answer*

***Average unit cost*** $= \frac{\text{Total Joint Cost}}{\text{Total Units}} = \frac{60,000}{1,000} =$ ***₹60 per unit***

***Joint Cost:***

***Product A*** = 500 Units × ₹60 = ***₹30,000***

***Product B*** = 200 Units × ₹60 = ***₹12,000***

***Product C*** = 300 Units × ₹60 = ***₹18,000***

### *BQ 3*

An entity incurs a joint cost of ₹64,500 in producing two products A (200 units), B (200 units) and earns a sales revenue of ₹86,000 by selling @ ₹170 per unit of product A and product B @ ₹260 per unit.

***Apportion the joint cost on the basis of Market value at the point of separation.***

### *Answer*

***Statement Showing Apportionment of Joint Cost***

| *Particulars* | *Product A* | *Product B* |
|---|---|---|
| Number of units | 200 | 200 |
| Market value at separation point per unit | ₹170 | ₹260 |
| Total market value at separation point | ₹34,000 | ₹52,000 |
| ***Apportionment of Joint Cost ₹64,500 in 34 : 52*** | ***₹25,500*** | ***₹39,000*** |

### *BQ 4*

An entity incurs a joint cost of ₹64,500 in producing two products A (200 units), B (200 units) and sale price of the products A and B after further processing are ₹200 and ₹300 respectively.

***Apportion the joint cost on the basis of Market value after further processing.***

### *Answer*

***Statement Showing Apportionment of Joint Cost***

| *Particulars* | *Product A* | *Product B* |
|---|---|---|
| Number of units<br>Market value after further processing per unit<br>Total market value after further processing | 200<br>₹200<br>₹40,000 | 200<br>₹300<br>₹60,000 |
| ***Apportionment of Joint Cost ₹64,500 in 40 : 60*** | ***₹25,800*** | ***₹38,700*** |

### BQ 5

An entity incurs a joint cost of ₹64,500 in producing two products A (200 units), B (200 units) and earns a sales revenue of ₹86,000 by selling @ ₹170 per unit of product A and product B @ ₹260 per unit. Further processing costs for products A and B are ₹4,000 and ₹32,000 respectively.

***Apportion the joint cost on the basis of Net Realisable Value at Split-off Point Method.***

### *Answer*

***Statement Showing Apportionment of Joint Cost***

| *Particulars* | *Product A* | *Product B* |
|---|---|---|
| Number of units | 200 | 200 |
| Market value after further processing<br>Less: Further processing cost | ₹34,000<br>₹4,000 | ₹52,000<br>₹32,000 |
| ***Net Realisable Value (NRV)*** | ***₹30,000*** | ***₹20,000*** |
| ***Apportionment of Joint Cost ₹64,500 in 30 : 20*** | ***₹38,700*** | ***₹25,800*** |

### BQ 6

***Find out the cost of joint products A and B using contribution margin method from the following data:***

| | | |
|---|---|---|
| Sales | Product A: | 100 kg @ ₹60 per kg. |
| | Product B: | 120 kg @ ₹30 per kg. |
| Joint costs | | Marginal cost ₹ 4,400 |
| | | Fixed cost ₹ 3,900 |

### *Answer*

***Statement Showing Apportionment of Joint Cost***

| *Particulars* | *Product A* | *Product B* |
|---|---|---|
| Number of units (Quantity in Kgs.) | 100 | 120 |
| ***Variable Joint Cost ₹4,400 in 100 : 120*** | ***₹2,000*** | ***₹2,400*** |
| Sales<br>Less: Variable joint cost | ₹6,000<br>₹2,000 | ₹3,600<br>₹2,400 |
| ***Contribution*** | ***₹4,000*** | ***₹1,200*** |
| ***Fixed Joint Cost ₹3,900 in 40 : 12*** | ***₹3,000*** | ***₹900*** |
| ***Total Joint Cost*** | ***₹5,000*** | ***₹3,300*** |

### BQ 7

***From the following details apportion ₹37,500 joint cost.***

| *Particulars* | *Product A* | *Product B* |
|---|---|---|
| Sale value after further processing | 50,000 | 80,000 |
| Profit | 10% | 20% |
| Selling expenses | 5% | 5% |
| Further cost | 25,000 | 40,000 |

**Answer**

**Statement Showing Apportionment of Joint Cost**

| Particulars | Product A | Product B |
|---|---|---|
| Sale value after further processing | 50,000 | 80,000 |
| Less: Profit | (5,000) | (16,000) |
| Less: Selling expenses | (2,500) | (4,000) |
| Less: Further cost | (25,000) | (40,000) |
| **Joint Cost** | **₹17,500** | **₹20,000** |

**BQ 8**

**From the following details apportion ₹39,000 joint cost using gross constant margin method.**

| Particulars | Product A | Product B |
|---|---|---|
| Sale value after further processing | 60,000 | 70,000 |
| Selling expenses | 5% | 5% |
| Further cost | 20,000 | 45,000 |

**Answer**

**Statement Showing Apportionment of Joint Cost**

| Particulars | Product A | Product B |
|---|---|---|
| Sale value after further processing | 60,000 | 70,000 |
| Less: Profit @ 15% | (9,000) | (10,500) |
| Less: Selling expenses | (3,000) | (3,500) |
| Less: Further cost | (20,000) | (45,000) |
| **Joint Cost** | **₹28,000** | **₹11,000** |

**Calculation of Constant % of Profit/Margin:**

| Particulars | | Total |
|---|---|---|
| Total sale value | (60,000 + 70,000) | 1,30,000 |
| Less: Total selling expenses | (3,000 + 3,500) | (6,500) |
| Less: Total further cost | (20,000 + 45,000) | (65,000) |
| Less: Total joint cost | | (39,000) |
| **Total Profit** | | **₹19,500** |
| **% of Profit [(19,500 ÷ 1,30,000) × 100]** | | **15%** |

**BQ 9**

Bright Chemicals Ltd. electrolyses common salt to obtain three joint products - caustic soda, chlorine and hydrogen. During a costing period, the expenditure relating to the inputs for the common process amounted to ₹3,50,000. After separation expenses amounting to ₹1,60,000, ₹75,000 and ₹10,000 were incurred for caustic soda, chlorine and hydrogen respectively.

The entire production was sold and ₹3,75,000, ₹2,50,000 and ₹60,000 were realised for caustic soda, chlorine and hydrogen respectively. The selling expenses were estimated at 5% of realizations sale. The management expected profits @ 15%, 10% and 5% of realization from sale of caustic soda, chlorine, and hydrogen respectively.

**Draw a columnar statement showing the apportionment of joint costs and the profitability of each product.**

**Answer**

**Statement Showing Apportionment of Joint Cost**

| Particulars | Soda | Chlorine | Hydrogen |
|---|---|---|---|
| Sale value after further processing | 3,75,000 | 2,50,000 | 60,000 |
| Less: Estimated profit @ 15%, 10% and 5% on sales | 56,250 | 25,000 | 3,000 |
| Less: Selling expenses @ 5% of sales | 18,750 | 12,500 | 3,000 |
| Less: Further cost | 1,60,000 | 75,000 | 10,000 |
| **Estimated Joint Cost** | **₹1,40,000** | **₹1,37,500** | **₹44,000** |

| | | | |
|---|---|---|---|
| *Joint Cost ₹3,50,000 in 1,400 : 1,375 : 440* | *₹1,52,411* | *₹1,49,689* | *₹47,900* |
| *Profit (Sales – Selling expenses – Further cost – Actual Joint cost)* | *₹43,839* | *₹12,811* | *(₹900)* |

### BQ 10

The yield of a certain process is 80% as to the main product, 15% as to the by-product and 5% as to the process loss. The material put in process (5,000 units) cost ₹23.75 per unit and all other charges are ₹14,250, of which power cost accounted for 33-⅓%. It is ascertained that power is chargeable as to the main product and by-product in the ratio of 10 : 9.

***Draw up a statement showing the cost of the main product and by-product.***

### Answer

***Statement Showing Cost of Main Product and By Product***

| Particulars | | Amount | Basis | Main Product | By Product |
|---|---|---|---|---|---|
| Material | (5,000 × ₹23.75) | 1,18,750 | 4,000 : 750 | 1,00,000 | 18,750 |
| Other charges than power | (14,250 × 66-⅔) | 9,500 | 4,000 : 750 | 8,000 | 1,500 |
| Power | (14,250 × 33-⅓) | 4,750 | 10 : 9 | 2,500 | 2,250 |
| ***Total Cost*** | | ***₹1,33,000*** | | ***₹1,10,500*** | ***₹22,500*** |

## FURTHER PROCESSING DECISION

### BQ 11

***From the following details advise whether products should be processed further or not:***

| Particulars | | Product A | Product B | Product C |
|---|---|---|---|---|
| ***Sale value:*** | After further processing | 1,50,000 | 2,40,000 | 70,000 |
| | At separation point | 80,000 | 1,50,000 | 50,000 |
| ***Selling expenses:*** | After further processing | 20,000 | 30,000 | 12,000 |
| | At separation point | 15,000 | 20,000 | 7,000 |
| ***Further cost*** | | 30,000 | 80,000 | 35,000 |

### Answer

***Statement Showing Further Processing Decision***

| Product | Calculation Incremental Revenue and Cost | Status | Decision |
|---|---|---|---|
| ***A*** | IR = 1,50,000 – 80,000 = 70,000<br>IC = 30,000 + (20,000 – 15,000) = 35,000 | IR > IC | ***Yes*** |
| ***B*** | IR = 2,40,000 – 1,50,000 = 90,000<br>IC = 80,000 + (30,000 – 20,000) = 90,000 | IR = IC | ***Indifferent*** |
| ***C*** | IR = 70,000 – 50,000 = 20,000<br>IC = 35,000 + (12,000 – 7,000) = 40,000 | IR < IC | ***No*** |

### BQ 12

Sellwell Ltd. operates a chemical process which produces four products A, B, C and D from a basis raw material. The company's budget for a month is as under:

| | | |
|---|---|---|
| Raw materials consumption | : | ₹17,520 |
| Initial processing wages | : | ₹16,240 |
| Initial processing overheads | : | ₹16,240 |
| | | ***₹50,000*** |

| Product | Production (in kgs) | Sales (in ₹) | Separate costs (in ₹) |
|---|---|---|---|
| A | 16,000 | 1,09,600 | 28,800 |
| B | 200 | 5,600 | Nil |
| C | 2,000 | 30,000 | 16,000 |
| D | 360 | 21,600 | 6,600 |

The company presently intends to sell product B at the point of split off without further processing. The remaining products A, C and D are to be further processed and sold. However, the management has been advised that it would be possible to sell all the four products at the split off point without further processing and if this course was adopted. The selling prices would be as under:

| *Product* | *A* | *B* | *C* | *D* |
|---|---|---|---|---|
| Selling Price Per Kg (in ₹) | 4.00 | 28.00 | 8.00 | 40.00 |

The joint costs are to be apportioned on the basis of the ***sales value realisation at the point of split-off***.

***You are required to:***

***(a)*** Prepare a statement showing the apportionment of joint costs.
***(b)*** Prepare a statement showing the product wise and total budgeted profit or loss based on the proposal to sell product B at the split-off point and products A, C and D after further processing.
***(c)*** Prepare a statement to show the product wise and total profit or loss if the alternative strategy to sell all the products at split off stage was adopted.
***(d)*** Recommend any other alternative which, in your opinion, can increase the total profit. Further calculate the total profit as also the product wise profit or loss based on your recommendation.

***[(a) 32,000; 2,800; 8,000; 7,200 (b) 48,800; 2,800; 6,000; 7,800; 65,400 (c) 32,000; 2,800; 8,000; 7,200; 50,000 (d) B & C should be sold at split off point and A and D after further processing; 48,800; 2,800; 8,000; 7,800; 67,400]***

## BQ 13

Tee Pee Ltd. in the course of refining crude oil obtains four joint products A, B, C and D. The total cost till the split off point was ₹97,600. The output and sales in the year 2016 were as follows:

| *Product* | *Output (in gallons)* | *Sales (in ₹)* | *Separate costs (in ₹)* |
|---|---|---|---|
| A | 5,00,000 | 1,15,000 | 30,000 |
| B | 10,000 | 10,000 | 6,000 |
| C | 5,000 | 4,000 | NIL |
| D | 9,000 | 30,000 | 1,000 |

***You are required to:***

***(i)*** Calculate the net income for each of the product if the joint costs are apportioned on the basis of ***sales value of the different products.***
***(ii)*** What would be the net income of the company from each product if it decides to sell the products at the split off point itself @ A 15 paise; B 50 paise; C 80 paise and D ₹3 per gallons?
***(iii)*** In case the company expect to operate at the same level of production and sales in the year 2017, could the company increase the net income by altering its processing decisions? If so, what would be the expected overall net income? Which products should be processed further and which should be sold at split off? Assume that all costs incurred after the split off are variable.

***[(i) 14,409; (2,139); 1,545; 10,585 (ii) 4,409; (1,139), 1,545; 8,585 (iii) Yes; 25,400 Product B and C should be sold at split off point and A and D after further processing]***

## BQ 14

A company purchases raw materials worth ₹11.04 lakhs and processes them into four products P, Q, R and S, which have a unit sale value of ₹3, ₹9, ₹16 and ₹60 respectively at split-off point, as they could be sold as such to other processors. However, during a year, the company decided to further process and sell products P, Q and S, while R was not to be processed further but sold at split-off point to other processors. The processing of raw materials into the four products cost ₹28 lakhs to the company. The other data for the year were as under:

| *Product* | *Output (in units)* | *Sales (in ₹)* | *Separate costs (in ₹)* |
|---|---|---|---|
| P | 10,00,000 | 46,00,000 | 12,00,000 |
| Q | 20,000 | 4,00,000 | 2,40,000 |
| R | 10,000 | 1,60,000 | NIL |
| S | 18,000 | 12,00,000 | 40,000 |

***You are required to work out the following information for managerial decision-making:***

**(a)** If the joint costs are allocated amongst the four products on the basis of ***Net realizable value at split-off point***, what would be the company's annual income?
**(b)** If the company had sold off all the other three products at split-off stage, identify the increase or decrease in the company's annual income as compared to ***(a)*** above.
**(c)** What sales strategy could the company have planned to maximize its profits in the year?
**(d)** Identify the net increase in income if the strategy at ***(c)*** is adopted, as compared to ***(a)*** above.

### *Answer*

***(a) Statement Showing Annual Income***
***(Net Realisable Value Method)***

| Products | P (₹) | Q (₹) | R (₹) | S (₹) | Total (₹) |
|---|---|---|---|---|---|
| Sales value after further processing | 46,00,000 | 4,00,000 | 1,60,000 | 12,00,000 | 63,60,000 |
| Less: Further cost | 12,00,000 | 2,40,000 | - | 40,000 | 14,80,000 |
| Net Realisable Value | 34,00,000 | 1,60,000 | 1,60,000 | 11,60,000 | 48,80,000 |
| ***Joint Cost (in NRV proportion)*** | ***27,20,000*** | ***1,28,000*** | ***1,28,000*** | ***9,28,000*** | ***39,04,000*** |
| Sales value after further processing | 46,00,000 | 4,00,000 | 1,60,000 | 12,00,000 | 63,60,000 |
| Less: Further cost | 12,00,000 | 2,40,000 | - | 40,000 | 14,80,000 |
| Less: Joint cost | 27,20,000 | 1,28,000 | 1,28,000 | 9,28,000 | 39,04,000 |
| ***Annual Income*** | ***6,80,000*** | ***32,000*** | ***32,000*** | ***2,32,000*** | ***9,76,000*** |

Joint cost = Raw material cost + Processing cost (excluding material cost)
= 11,04,000 + 28,00,000 = ***39,04,000***

***(b) Statement Showing Annual Income***
***(When all products are sold at split off stage)***

| Products | P (₹) | Q (₹) | R (₹) | S (₹) | Total (₹) |
|---|---|---|---|---|---|
| Number of units | 10,00,000 | 20,000 | 10,000 | 18,000 | - |
| Sale price per unit at split off stage | ₹3 | ₹9 | ₹16 | ₹60 | - |
| Sales value at split off stage | 30,00,000 | 1,80,000 | 1,60,000 | 10,80,000 | 44,20,000 |
| Less: Joint cost | 27,20,000 | 1,28,000 | 1,28,000 | 9,28,000 | 39,04,000 |
| ***Annual Income*** | ***2,80,000*** | ***52,000*** | ***32,000*** | ***1,52,000*** | ***5,16,000*** |
| ***Increase/(Decrease) in Income (5,16,000 – 9,76,000)*** | | | | | ***(4,60,000)*** |

**(c)** ***Strategy to maximize profits:*** Best production plan will be to sell P and S after further processing and Q and R at the point of split off.

***(d) Statement Showing Net Increase in Income***
***(If strategy is adopted)***

| Products | P (₹) | Q (₹) | R (₹) | S (₹) | Total (₹) |
|---|---|---|---|---|---|
| Sales value | 46,00,000 | 1,80,000 | 1,60,000 | 12,00,000 | 63,60,000 |
| Less: Further cost | 12,00,000 | - | - | 40,000 | 14,80,000 |
| Less: Joint cost | 27,20,000 | 1,28,000 | 1,28,000 | 9,28,000 | 39,04,000 |
| ***Annual Income*** | ***6,80,000*** | ***52,000*** | ***32,000*** | ***2,32,000*** | ***9,96,000*** |
| ***Net Increase in Income (9,96,000 – 9,76,000)*** | | | | | ***20,000*** |

### *BQ 15*

A company's plant processes 1,50,000 kgs of raw material in a month to produce two products, viz., 'P' and 'Q'. The cost of raw material is ₹12 per kg and the process costs per month are:

| | | |
|---|---|---|
| Direct materials | : | ₹90,000 |
| Direct wages | : | ₹1,20,000 |
| Variable overheads | : | ₹1,00,000 |
| Fixed overheads | : | ₹1,00,000 |

The loss in process is 5% of input and the output ratio of P and Q which emerge simultaneously is 1:2. The selling prices of the two products at the point of split off are P ₹12 per kg and Q ₹20 per kg. A proposal is available to process product P further by mixing it with other purchased materials. The entire current output of the plant can be so processed further to obtain a new product 'S'. The price per kg of S is ₹15 and each kg of output of S will require one kilogram of input P. The cost of processing of P into S (including other materials) is ₹1,85,000 per month.

***You are required to prepare a statement showing the monthly profitability based both on the existing manufacturing operation and on further processing? Will you recommend further processing?***

***[2,60,000; 2,17,500; No, product P should not be further processed]***

### BQ 16

'Buttery Butter' is engaged in the production of Buttermilk, Butter and Ghee. It purchases processed cream and let it through the process of churning until it separates into buttermilk and butter. For the month of January, 2023, 'Buttery Butter' purchased 50 Kilolitre processed cream @ ₹100 per 1,000 ml. Conversion cost of ₹1,00,000 were incurred upto the split off point, where two saleable products were produced i.e. buttermilk and butter. Butter can be further processed into Ghee.

***The January, 2023 production and sales information is as follows:***

| Products | Production (in Kilolitre/tonne) | Sales Quantity (in Kilolitre/tonne) | Selling price per Litre/Kg (₹) |
|---|---|---|---|
| Buttermilk | 28 | 28 | 30 |
| Butter | 20 | - | - |
| Ghee | 16 | 16 | 480 |

All 20 tonne of butter were further processed at an incremental cost of ₹1,20,000 to yield 16 Kilolitre of Ghee. There was no opening or closing inventories of buttermilk, butter or ghee in January, 2023.

***Required:***

***(a)*** Show how joint cost would be apportioned between Buttermilk and Butter under ***Estimated Net Realisable Value method.***

***(b)*** 'Healthy Bones' offers to purchase 20 tonne of butter in February at ₹360 per kg. In case 'Buttery Butter' accepts this offer, no Ghee would be produced in February. Suggest whether 'Buttery Butter' shall accept the offer affecting its operating income or further process butter to make Ghee itself?

### Answer

***(a) Statement Showing Apportionment of Joint Cost***
***(Estimated Net Realisable Value Method)***

| Particulars | Buttermilk Amount (₹) | Butter Amount (₹) |
|---|---|---|
| Sales Value | 8,40,000 (₹30 × 28 × 1000) | 76,80,000 (₹480 × 16 × 1000) |
| Less: Post split-off cost (Further processing cost) | - | (1,20,000) |
| Net Realisable Value | 8,40,000 | 75,60,000 |
| Apportionment of Joint Cost of ₹51,00,000 in ratio of 1:9 | ***5,10,000*** | ***45,90,000*** |

Joint cost = (₹100 × 50 × 1000) + ₹1,00,000 = ***₹51,00,000***

***(b) Further processing of Butter into Ghee decision:***

| | | | | |
|---|---|---|---|---|
| Incremental revenue | = | ₹480 × 16 × 1000 - ₹360 × 20 × 1000 | = | ₹4,80,000 |
| Incremental cost | = | ₹1,20,000 | | |
| Incremental benefit | = | ₹4,80,000 - ₹1,20,000 | = | ₹3,60,000 |

The operating income of 'Buttery Butter' will be reduced by ₹3,60,000 in February if it sells 20 tonne of Butter to 'Healthy Bones', instead of further processing of Butter into Ghee for sale. Thus, 'Buttery Butter' is advised ***not to accept*** the offer and further process butter to make Ghee itself.

### *BQ 17*

Inorganic Chemicals purchases salt and processes it into more refined products such as Caustic Soda, Chlorine and PVC (Polyvinyl chloride). During the month of July, Inorganic Chemicals purchased Salt for ₹40,000. Conversion costs of ₹60,000 were incurred upto the split off point, at which time two saleable products were produced viz. Caustic soda and Chlorine. Chlorine can be further processed in PVC. The July production and sales information is as follows:

| | *Production (tonnes)* | *Sales Quantity (tonnes)* | *Selling price (per tonne)* |
|---|---|---|---|
| Caustic Soda | 1,200 | 1,200 | ₹50 |
| Chlorine | 800 | - | - |
| PVC | 500 | 500 | ₹200 |

All 800 tonnes of Chlorine were further processed at an incremental cost of ₹20,000 to yield 500 tonnes of PVC. There were no by products or scrap from this further processing of Chlorine. There were no beginning or ending inventories of Caustic Soda, Chlorine or PVC in July.

There is an active market for Chlorine. Inorganic Chemicals could have sold all its July production of Chlorine at ₹75 a tonne.

### *Required*

1. To calculate how the joint cost of ₹1,00,000 would be allocated between Caustic Soda and Chlorine under each of the following methods:
   *(a)* Sales value at split off point;
   *(b)* Physical unit method; and
   *(c)* Estimated NRV.

2. Lifetime Swimming Pool Products offers to purchase 800 tonnes of Chlorine in August at ₹75 per ton. This sale would mean that no PVC would be produced in August. Explain how would accepting the offer affect August's operating income?

### *Answer*

#### *1. Statement Showing Allocation of Joint Cost*

| *Particulars* | *Joint Products* | |
|---|---|---|
| | *Caustic Soda* | *Chlorine* |
| *(a)* Allocation of joint cost on the basis of sale value at split off point: | (1,200 × 50) | (800 × 75) |
| Sale Value of production at split off (production × sales price) | 60,000 | 60,000 |
| Share of joint cost of ₹1,00,000 in ratio ***(60 : 60)*** | ***50,000*** | ***50,000*** |
| *(b)* Allocation of joint cost on ten basis of physical measure: | | |
| Output at split off point | 1,200 tonnes | 800 tonnes |
| Share of joint cost of ₹1,00,000 in ratio ***(12 : 8)*** | ***60,000*** | ***40,000*** |
| *(c)* Allocation of joint cost on the basis of estimated NRV: | | |
| Sale Value of production after further processing | (1,200 × 50) | (500 × 200) |
| (output after further processing × sales price) | 60,000 | 1,00,000 |
| Less: Further processing cost | - | 20,000 |
| Net Realizable Value (NRV) | 60,000 | 80,000 |
| Share of joint cost of ₹1,00,000 in ratio ***(60 : 80)*** | ***42,857*** | ***57,143*** |

#### *2. Analysis of Life Swimming Pool Products*

| | |
|---|---|
| Sale value of 500 tons of PVC @ ₹200 per tonne | 1,00,000 |
| Less: Sale Value of 800 tons of Chlorine | 60,000 |
| ***Incremental Revenue*** | ***40,000*** |
| Cost of further processing chlorine into PVC | 20 000 |
| ***Increase in net income due to further processing of chlorine into PVC*** | ***20,000*** |

The operating income of Inorganic Chemicals will be reduced by ₹20,000 in August if it sells 800 tons of Chlorine to Lifetime Swimming Pool Products, instead of further processing of Chlorine into PVC for sale.

### BQ 18

Sun-moon Ltd. produces and sells the following products:

| Products | Units | Selling price at split-off point (₹) | Selling price after further processing (₹) |
|---|---|---|---|
| A | 2,00,000 | 17 | 25 |
| B | 30,000 | 13 | 17 |
| C | 25,000 | 8 | 12 |
| D | 20,000 | 10 | - |
| E | 75,000 | 14 | 20 |

Raw material costs ₹35,90,000 and other manufacturing expenses cost ₹5,47,000 in the manufacturing process which are absorbed on the products on the basis of their ***'Net realisable value'***. The further processing costs of A, B, C and E are ₹12,50,000; ₹1,50,000; ₹50,000 and ₹1,50,000 respectively. Fixed costs are ₹4,73,000.

***You are required to prepare the following in respect of the coming year:***

***(a)*** Statement showing income forecast of the company assuming that none of its products are to be further processed.

***(b)*** Statement showing income forecast of the company assuming that products A, B, C and E are to be processed further.

***(c)*** Can you suggest any other production plan whereby the company can maximise its profits? If yes, then submit a statement showing income forecast arising out of adoption of that plan.

### Answer

***(a) Statement Showing Income Forecast of the Company***
***(Assuming that none of its products are further processed)***

| Products | A (₹) | B (₹) | C (₹) | D (₹) | E (₹) | Total (₹) |
|---|---|---|---|---|---|---|
| Number of units | 2,00,000 | 30,000 | 25,000 | 20,000 | 75,000 | - |
| Sale price per unit | 17 | 13 | 8 | 10 | 14 | - |
| Sales revenue | 34,00,000 | 3,90,000 | 2,00,000 | 2,00,000 | 10,50,000 | 52,40,000 |
| Less: Apportioned cost | 26,25,000 | 2,52,000 | 1,75,000 | 1,40,000 | 9,45,000 | 41,37,000 |
| | 7,75,000 | 1,38,000 | 25,000 | 60,000 | 1,05,000 | 11,03,000 |
| Less: Fixed cost | | | | | | 4,73,000 |
| ***Profit*** | | | | | | ***6,30,000*** |

***(b) Statement Showing Income Forecast of the Company***
***(Assuming that products A, B, C and E are further processed)***

| Products | A (₹) | B (₹) | C (₹) | D (₹) | E (₹) | Total (₹) |
|---|---|---|---|---|---|---|
| Number of units | 2,00,000 | 30,000 | 25,000 | 20,000 | 75,000 | - |
| Sale price per unit | 25 | 17 | 12 | 10 | 20 | - |
| Sales revenue | 50,00,000 | 5,10,000 | 3,00,000 | 2,00,000 | 15,00,000 | 75,10,000 |
| Less: Apportioned cost | 26,25,000 | 2,52,000 | 1,75,000 | 1,40,000 | 9,45,000 | 41,37,000 |
| Less: Further cost | 12,50,000 | 1,50,000 | 50,000 | - | 1,50,000 | 16,00,000 |
| | 11,25,000 | 1,08,000 | 75,000 | 60,000 | 4,05,000 | 17,73,000 |
| Less: Fixed cost | | | | | | 4,73,000 |
| ***Profit*** | | | | | | ***13,00,000*** |

***(c)*** ***Suggested production plan for maximising profits:*** On comparing the figures of excess of revenue over cost of manufacturing in the above statements one observes that the concern is earning more after further processing of A, C and E products but is loosing a sum of ₹30,000 in the case of product B (if it is processed further). Hence the best production plan will be to sell A, C and E after further processing and B and D at the point of split off. The profit statement based on this suggested production plan is as below:

***Profit Statement Based on Suggested Production Plan***

| Products | A (₹) | B (₹) | C (₹) | D (₹) | E (₹) | Total (₹) |
|---|---|---|---|---|---|---|
| Number of units | 2,00,000 | 30,000 | 25,000 | 20,000 | 75,000 | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| Sale price per unit | 25 | 13 | 12 | 10 | 20 | - |
| Sales revenue | 50,00,000 | 3,90,000 | 3,00,000 | 2,00,000 | 15,00,000 | 73,90,000 |
| Less: Apportioned cost | 26,25,000 | 2,52,000 | 1,75,000 | 1,40,000 | 9,45,000 | 41,37,000 |
| Less: Further cost | 12,50,000 | - | 50,000 | - | 1,50,000 | 14,50,000 |
| | 11,25,000 | 1,38,000 | 75,000 | 60,000 | 4,05,000 | 18,03,000 |
| Less: Fixed cost | | | | | | 4,73,000 |
| ***Profit*** | | | | | | ***13,30,000*** |

***Hence the profit of the company has increased by ₹30,000***

***Working note:***

***Statement Showing Apportionment of Joint Cost***
***(Net Realisable Value Method)***

| ***Products*** | ***A (₹)*** | ***B (₹)*** | ***C (₹)*** | ***D (₹)*** | ***E (₹)*** |
|---|---|---|---|---|---|
| Number of units | 2,00,000 | 30,000 | 25,000 | 20,000 | 75,000 |
| Sale price per unit | 25 | 17 | 12 | 10 | 20 |
| Sales revenue | 50,00,000 | 5,10,000 | 3,00,000 | 2,00,000 | 15,00,000 |
| Less: Further cost | 12,50,000 | 1,50,000 | 50,000 | - | 1,50,000 |
| Net Realisable Value | 37,50,000 | 3,60,000 | 2,50,000 | 2,00,000 | 13,50,000 |
| ***Joint cost (in NRV proportion)*** | ***26,25,000*** | ***2,52,000*** | ***1,75,000*** | ***1,40,000*** | ***9,45,000*** |

Joint cost = Raw material cost + other manufacturing expenses
= 35,90,000 + 5,47,000 = ***41,37,000***

***BQ 19***

A company processes a raw material in its department 1 to produce three products, viz., A, B and X at the same split-off stage. During a period 1,80,000 kgs of raw materials were processed in department 1 at a total cost of ₹12,88,000 and the resultant output of A, B and X were 18,000 kgs, 10,000 kgs and 54,000 kgs respectively. A and B were further processed in department 2 at a cost of ₹1,80,000 and ₹1,50,000 respectively.

X was further processed in department 3 at a cost of ₹1,08,000. There is no waste in further processing. The details of sales effected during the period were as under:

| | ***A*** | ***B*** | ***X*** |
|---|---|---|---|
| Quantity sold (kgs) | 17,000 | 5,000 | 44,000 |
| Sales value | ₹12,24,000 | ₹2,50,000 | ₹7,92,000 |

There were no opening stocks. If these products were sold at split-off stage, the selling prices of A, B and X would have been ₹50, ₹40 and ₹10 per kg respectively.

***Required:***

1. Prepare a statement showing the apportionment of joint cost to A, B and X.
2. Present a statement showing the cost per kg of each product indicating joint cost, further processing cost and total cost separately.
3. Prepare a statement showing the product wise and total profit for the period.
4. State with supporting calculations as to whether any or all the products should be further processed or not.

***[(1) A 6,30,000; B 2,80,000; X 3,78,000 (2) A ₹35, ₹10, ₹45; B ₹28, ₹15, ₹43; X ₹7, ₹2, ₹9 (3) A 4,59,000; B 35,000; X 3,96,000; Total 8,90,000 (4) Product B should be sold at split off point and A and X after further processing]***

## ***BY PRODUCTS***

***BQ 20***

A Factory is engaged in the production of a chemical BOMEX and in the course of its manufacture, a by- product BRUCIL is produced, which after further processing has commercial value. For the month of April 2023, the following are the summarised cost data.

| | Joint Expenses | Separate Expenses | |
|---|---|---|---|
| | | BOMEX | BRUCIL |
| Materials | 1,00,000 | 6,000 | 4,000 |
| Labour | 50,000 | 20,000 | 18,000 |
| Overheads | 30,000 | 10,000 | 6,000 |
| Selling price per unit | | 98 | 34 |
| Estimated profit per unit on sale of BRUCIL | | | 4 |
| No. of units produced | | 2,000 | 2,000 |

The factory uses reverse cost method of accounting for by-products where by the sales value of by-products after deduction of the estimated profit, post separation cost and selling and distribution expenses relating to the by product is credited to the joint process account.

***You are required to prepare statements showing:***

***(1)*** The joint cost allocable to BOMEX.

***(2)*** The product wise and overall profitability of the factory for April 2023.

### *Answer*

***(1) Statement of Allocation of Joint Cost to BOMEX***

| Particulars | | Amount (₹) |
|---|---|---|
| Sales value of BRUCIL | (2,000 units × ₹34) | 68,000 |
| Less: Estimated profit | (2,000 units × ₹4) | 8,000 |
| Less: Separate cost | (₹4,000 + ₹18,000 + ₹6,000) | 28,000 |
| ***Joint Cost of BRUCIL*** | | ***32,000*** |
| Total Joint Cost | (₹1,00,000 + ₹50,000 + ₹30,000) | 1,80,000 |
| Less: Joint cost allocable to BRUCIL | | 32,000 |
| ***Joint Cost allocable to BOMEX*** | | ***1,48,000*** |

***(2) Product-wise & Overall Profitability Statement***

| Particulars | BOMEX | BRUCIL | Total |
|---|---|---|---|
| Sales value | 1,96,000 | 68,000 | 2,64,000 |
| Less: Separate cost | 36,000 | 28,000 | 64,000 |
| Less: Joint cost | 1,48,000 | 32,000 | 1,80,000 |
| ***Profit*** | ***12,000*** | ***8,000*** | ***20,000*** |

### *BQ 21*

A factory producing article P also produces a by-product Q which is further processed into finished product.

***The joint costs of manufacture are given below:***

| | |
|---|---|
| Material | ₹5,000 |
| Labour | ₹3,000 |
| Overheads | ₹2,000 |
| | ***₹10,000*** |

***Subsequent costs are given below:***

| | P | Q |
|---|---|---|
| Material | ₹3,000 | ₹1,500 |
| Labour | ₹1,400 | ₹1,000 |
| Overheads | ₹600 | ₹500 |
| | ***₹5,000*** | ***₹3,000*** |

***Selling Price:***

| | |
|---|---|
| Product P | ₹16,000 |
| Product Q | ₹8,000 |

***Estimated profits on selling prices:***

| | |
|---|---|
| Product P | 25% |
| Product Q | 20% |

***Assume that selling and distributing expenses are in proportion of sales prices. Show how you would apportion joint costs of manufacture and prepare a statement showing cost of production of P and Q.***

***Answer***

***Statement Showing Apportionment of Joint Cost***

| *Particulars* | *Article P* | *By-product Q* |
|---|---|---|
| Sales value | 16,000 | 8,000 |
| Less: Profit @ 25% of 16,000 & 20% of 8,000 | 4,000 | 1,600 |
| Less: Selling expenses (400 in 16 : 8) | 267 | 133 |
| Less: Subsequent cost | 5,000 | 3,000 |
| ***Joint cost*** | ***6,733*** | ***3,267*** |

***Statement Showing Cost of Production***

| *Particulars* | *Article P* | *By-product Q* |
|---|---|---|
| Joint cost | 6,733 | 3,267 |
| Subsequent cost | 5,000 | 3,000 |
| ***Cost of Production*** | ***11,733*** | ***6,267*** |

**** Calculation of selling expenses:***

Selling expenses = Total sales – Total profit – Total subsequent cost – Total joint cost
= (16,000 + 8,000) – (4,000 + 1,600) – (5,000 + 3,000) – 10,000 = ***400***

***BQ 22***

In a manufacturing process, in the course of manufacture of the product X, the by-products P and Q also emerge. The pre-separation expenses amount to ₹1,19,550. All the three products are processed further and sold in the market (details given below):

| | *Main product X* | *By-product P* | *By-product Q* |
|---|---|---|---|
| Sales Value | ₹90,000 | ₹60,000 | ₹40,000 |
| Post-separation Costs | ₹6,000 | ₹5,000 | ₹4,000 |
| Profit as a Percentage of Sales | 25% | 20% | 15% |

Total fixed selling and distribution expenses are 10% of the total cost of sales and are apportioned to the three products in the ratio of 20:40:40.

***(1)*** Prepare a statement showing the apportionment of pre-separation costs to the main product and the two by-products.

***(2)*** If the by-product P is not processed further and can be sold just after separation at ₹58,500 without incurring any selling and distribution expenses, would you advise its disposal at that stage?

***[(1) X 58,510; P 37,020; Q 24,020 (2) Product P should be sold at split off point, increase in profit ₹3,500]***

***BQ 23***

Smile company produces two main products and a by-product out of a joint process. The ratio of output quantities to input quantities of direct material used in the joint process remains consistent on yearly basis. Company has employed the physical volume method to allocate joint production costs to the main products. The net realizable value of the by-product is used to reduce the joint production costs before the joint costs are allocated to the main products. Details of company's operation are given in the table below. During the month, company incurred joint production costs of ₹10,00,000. The main products are not marketable at the split off point and thus have to be processed further.

| *Particulars* | *Product A* | *Product B* | *By Product* |
|---|---|---|---|
| Monthly output in kg. | 60,000 | 1,20,000 | 50,000 |
| Selling price per kg. | ₹ 50 | ₹ 30 | ₹ 5 |
| Process costs | ₹ 2,00,000 | ₹ 3,00,000 | |

***Find out the amount of joint product cost that Smile company would allocate to the product B by using the physical volume method to allocate joint production costs?***

***Answer***

***Calculation of Net joint costs to be allocated:***

| *Particulars* | *Amount (₹)* |
|---|---|
| Joint Costs | 10,00,000 |
| Less: Net Realizable value of by-product (50,000×5) | 2,50,000 |
| Net joint costs to be allocated | 7,50,000 |

$$\text{Joint cost allocable to Product B} = \frac{\text{Net joint cost allocable to products}}{\text{Total Units}} \times \text{Physical quantity of Product B}$$

$$= \frac{7,50,000}{60,000+1,20,000} \times 1,20,000 = \textbf{₹5,00,000}$$

## *BQ 24*

NN Manufacturing company uses joint production process that produces three products at the split off point. Joint productions costs during September were ₹8,40,000. Product information for September was as follows:

| *Particulars* | *Product A* | *Product B* | *Product C* |
|---|---|---|---|
| Units produced | 1,500 | 3,000 | 4,500 |
| Units sold | 2,000 | 6,000 | 7,500 |
| Sales prices: | | | |
| At the split-off | ₹100 | - | - |
| After further processing | ₹150 | ₹ 175 | ₹50 |
| Costs to process after split-off | ₹1,50,000 | ₹1,50,000 | ₹1,50,000 |

Assume that product C is treated as a by-product and the company accounts for the by-product at net realizable value as a reduction of joint cost. Assume also that Product B & C must be processed further before they can be sold. Find out the total cost of Product A in September if joint cost allocation is based on net realizable values.

***Answer***

***Calculation of Net joint costs to be allocated:***

| *Particulars* | *Amount (₹)* |
|---|---|
| Joint Costs | 8,40,000 |
| Less: Net Realizable value of by-product {(4,500×50) – 1,50,000} | 75,000 |
| Net joint costs to be allocated | 7,65,000 |

***Note:*** Product A can be sold at the split-off point, because the question says that "Products B and C must be processed further before they can be sold." Since product A is not included in that, we know that Product A can be sold at the split-off point. Furthermore, the cost to process Product A after the split-off point is ₹150,000, whereas the additional revenue to be earned by processing it further is only ₹75,000 (₹50 increase in selling price per unit multiplied by the 1,500 units produced during September). ***Therefore, Product A will not be processed further***, and we use the sales value at split-off for A for allocating the joint costs. The sales value at the split-off for A is ₹100 × 1,500 units, or ₹1,50,000.

***Statement Showing Total Cost of Product A***
***(Estimated Net Realisable Value Method)***

| *Particulars* | *Product A Amount (₹)* | *Product B Amount (₹)* |
|---|---|---|
| Sales Value of units Produced | 1,50,000 | 5,25,000 |
| (Product A at split off and B after further processing) | (₹100 × 1,500) | (₹175 × 3,000) |
| Less: Further processing cost | - | (1,50,000) |
| Net Realisable Value | 1,50,000 | 3,75,000 |
| Apportionment of Joint Cost of ₹7,65,000 in ratio of 2:5 | ***2,18,571*** | ***5,46,429*** |
| Add: Further processing cost | *-* | ***1,50,000*** |
| ***Total Cost of product*** | ***2,18,571*** | ***6,96,429*** |

### *BQ 25*

A firm manufactures three joint products A, B and C and by-product X by processing a common stock of raw material which costs ₹8 per kg. The details of output, market price and the initial processing cost for an input of 10,000 kgs of raw materials are as follows:

| *Product* | *Output (in kg)* | *Current market price* |
|---|---|---|
| A | 5,000 | ₹18 |
| B | 2,500 | ₹20 |
| C | 1,500 | ₹24 |
| X | 500 | ₹4 |

***Initial processing cost:***

| | | |
|---|---|---|
| Direct labour | : | 1,000 hours @ ₹20 per hour |
| Variable overhead | : | 80% of direct labour |
| Fixed overheads | : | ₹21,000 |

The company apportions common cost ***among joint products on physical unit basis***. All the products including the by-product can be processed further and sold at the higher market price with some sales promotion effort. The estimated further processing cost, marketing cost and the final selling price are given below:

| *Product* | *Further processing cost* | *Further marketing cost* | *Final price per kg* |
|---|---|---|---|
| A | ₹4.00 | ₹2.00 | ₹28.00 |
| B | ₹5.00 | ₹2.00 | ₹26.00 |
| C | ₹6.00 | ₹2.00 | ₹34.00 |
| X | ₹2.00 | ₹1.00 | ₹6.00 |

***Required:***

***(a)*** Cost of joint products at the point of separation after initial processing.
***(b)*** Profit or loss if the products are sold without further processing.
***(c)*** Which of the products have to be processed further for maximizing profits? Show workings.

### *Answer*

***(a) Statement Showing Apportionment of Joint Cost***
***(Physical Unit Method)***

| *Products* | *A (₹)* | *B (₹)* | *C (₹)* |
|---|---|---|---|
| Number of units (in kgs) | 5,000 | 2,500 | 1,500 |
| ***Joint Cost ₹1,35,000 in 5,000 : 2,500: 1,500*** | ***75,000*** | ***37,500*** | ***22,500*** |

***(b) Statement Showing Profitability***
***(When products are sold without further processing)***

| *Products* | *A (₹)* | *B (₹)* | *C (₹)* |
|---|---|---|---|
| Sale value (5,000 × ₹18), (2,500 × ₹20) and (1,500 × ₹24) | 90,000 | 50,000 | 36,000 |
| Less: Joint Cost | 75,000 | 37,500 | 22,500 |
| ***Profit*** | ***15,000*** | ***12,500*** | ***13,500*** |

***(c) Statement Showing Further Processing Decision***

| *Product* | *Incremental Revenue p.u.* | *Incremental Cost p.u.* | *Status* | *Decision* |
|---|---|---|---|---|
| ***A*** | ₹28 – ₹18 = ₹10 | ₹4 + ₹2 = ₹6 | IR > IC | ***Yes*** |
| ***B*** | ₹26 – ₹20 = ₹6 | ₹5 + ₹2 = ₹7 | IR < IC | ***No*** |
| ***C*** | ₹34 – ₹24 = ₹10 | ₹6 + ₹2 = ₹8 | IR > IC | ***Yes*** |
| ***X*** | ₹6 – ₹4 = ₹2 | ₹2 + ₹1 = ₹3 | IR < IC | ***No*** |

***Working Note:***

***Calculation of joint cost:***

| ***Particulars*** | ***Amount (₹)*** |
|---|---|
| Raw materials (10,000 kgs × ₹8) | 80,000 |
| Direct labour (1,000 hours × ₹20) | 20,000 |
| Variable overheads (80% of 20,000) | 16,000 |
| Fixed overheads | 21,000 |
| ***Joint Cost*** | ***1,37,000*** |
| Less: Sale of By product X (500 kgs × ₹4) | (2,000) |
| ***Net Joint Cost*** | ***1,35,000*** |

# PAST YEAR QUESTIONS

### PYQ 1

Two products P and Q are obtained in a crude form and require further processing at a cost of ₹5 for P and ₹4 for Q per unit before sale. Assuming a net margin of 25 per cent on cost, their sale prices are fixed at ₹13.75 and ₹8.75 per unit respectively. During the period, the joint cost was ₹88,000 and the outputs were:

| | |
|---|---|
| P | 8,000 units |
| Q | 6,000 units |

***Ascertain the joint cost per unit.***

***[(5 Marks) May 1998]***

### Answer

***Statement Showing Joint Cost Per Unit***

| Pariculars | Product P | Product Q |
|---|---|---|
| Output (in units) | 8,000 units | 6,000 units |
| Sales value @ ₹13.75/ ₹8.75 per unit | 1,10,000 | 52,500 |
| Less: Profit @ 25% of cost or 20% of sales | 22,000 | 10,500 |
| Less: Further processing cost @ ₹5/ ₹4 per unit | 40,000 | 24,000 |
| Expected joint cost | 48,000 | 18,000 |
| Actual joint cost in proportion of expected joint cost (in proportion of 48 : 18) | 64,000 | 24,000 |
| ***Joint cost per unit*** | ***₹8*** | ***₹4*** |

### PYQ 2

The Sunshine Oil Company purchases crude vegetable oil. It does refining of the same. The refining process results in four products at the split-off point viz. M, N, O and P.

Product O is fully processed at the split-off point. Products M, N and P can be individually further refined into 'Super M', 'Super N' and 'Super P'. In the most recent month (October, 1999), the output at split-off point was:

| | |
|---|---|
| Product M | 3,00,000 gallons |
| Product N | 1,00,000 gallons |
| Product O | 50,000 gallons |
| Product P | 50,000 gallons |

The joint cost of purchasing the crude vegetable oil and processing it were ₹40,00,000. Sunshine had no beginning or ending inventories. Sales of product O in October were ₹20,00,000. Total output of products M, N and P was further refined and then sold. Data related to October, 1999 are as follows:

| | ***Further Processing Costs*** | ***Sales*** |
|---|---|---|
| 'Super M' | ₹80,00,000 | ₹1,20,00,000 |
| 'Super N' | ₹32,00,000 | ₹40,00,000 |
| 'Super P' | ₹36,00,000 | ₹48,00,000 |

Sunshine had the option of selling products M, N and P at the split-off point. This alternative would have yielded the following sales for the October, 1999 production:

| | |
|---|---|
| Product M | ₹20,00,000 |
| Product N | ₹12,00,000 |
| Product P | ₹28,00,000 |

***You are required to answer:***

***(1)*** How the joint cost of ₹40,00,000 would be allocated between each product under each of the following methods:

***(i)*** Sales value at split-off;

*(ii)* Physical output (gallons); and
*(iii)* Estimated net realisable value.

*(2)* Could Sunshine have increased its October, 1999 operating profits by making different decisions about the further refining of products M, N, or P? Show the effect of any change you recommend on operating profits.

*[(12 Marks) Nov 1999]*

## Answer

### (1) Apportionment of Joint Cost:

**(i) Statement of apportionment of joint costs (Sales value at split-off method)**

| Products | Sales value at split of point | Joint cost allocated |
|---|---|---|
| M | 20,00,000 | $20,00,000 \times \frac{40,00,000}{80,00,000} = 10,00,000$ |
| N | 12,00,000 | $12,00,000 \times \frac{40,00,000}{80,00,000} = 6,00,000$ |
| O | 20,00,000 | $20,00,000 \times \frac{40,00,000}{80,00,000} = 10,00,000$ |
| P | 28,00,000 | $28,00,000 \times \frac{40,00,000}{80,00,000} = 14,00,000$ |
| **Total** | **80,00,000** | **40,00,000** |

**(ii) Statement of apportionment of joint costs (Physical output method)**

| Products | Physical output | Joint cost allocated |
|---|---|---|
| M | 3,00,000 | $3,00,000 \times \frac{40,00,000}{5,00,000} = 24,00,000$ |
| N | 1,00,000 | $1,00,000 \times \frac{40,00,000}{5,00,000} = 8,00,000$ |
| O | 50,000 | $50,000 \times \frac{40,00,000}{5,00,000} = 4,00,000$ |
| P | 50,000 | $50,000 \times \frac{40,00,000}{5,00,000} = 4,00,000$ |
| **Total** | **5,00,000** | **40,00,000** |

**(iii) Statement of apportionment of joint costs (NRV method)**

| Products | Sales value | FPC | NRV | Joint cost allocated |
|---|---|---|---|---|
| M | 1,20,00,000 | 80,00,000 | 40,00,000 | $40,00,000 \times \frac{40,00,000}{80,00,000} = 20,00,000$ |
| N | 40,00,000 | 32,00,000 | 8,00,000 | $8,00,000 \times \frac{40,00,000}{80,00,000} = 4,00,000$ |
| O | 20,00,000 | - | 20,00,000 | $20,00,000 \times \frac{40,00,000}{80,00,000} = 10,00,000$ |
| P | 48,00,000 | 36,00,000 | 12,00,000 | $12,00,000 \times \frac{40,00,000}{80,00,000} = 6,00,000$ |
| **Total** | **2,28,00,000** | **1,48,00,000** | **80,00,000** | **40,00,000** |

### (2) Further Processing Decision:

| Products | Incremental revenue | Incremental cost | Situation | Decision |
|---|---|---|---|---|
| M | 1,20,00,000 – 20,00,000 = 1,00,00,000 | 80,00,000 | IR > IC | Yes |
| N | 40,00,000 – 12,00,000 = 28,00,000 | 32,00,000 | IR < IC | No |
| P | 48,00,000 – 28,00,000 = 20,00,000 | 36,00,000 | IR < IC | No |

***Decision:*** The above table shows that further processing of products N and P results in the decrease of the operating profit by ₹20,00,000. Hence, M/S Sunshine should not go for further processing of its N and P products. If these products are not processed further, it would increase the operating profits of the company for the month of October, 1999 by ₹20,00,000.

## PYQ 3

Inorganic Chemicals purchases salt and processes it into more refined products such as Caustic Soda, Chlorine and PVC (Polyvinyl chloride). During the month of April, 2000, Inorganic Chemicals purchased Salt for ₹10,00,000. Conversion costs of ₹15,00,000 were incurred upto the split off point, at which time two saleable products were produced viz. Caustic soda and Chlorine. Chlorine can be further processed in PVC. The April production and sales information is as follows:

| | Production (tonnes) | Sales Quantity (tonnes) | Selling price (per tonne) |
|---|---|---|---|
| Caustic Soda | 1,200 | 1,200 | ₹1,250 |
| Chlorine | 800 | - | - |
| PVC | 500 | 500 | ₹5,000 |

All 800 tonnes of Chlorine were further processed at an incremental cost of ₹5,00,000 to yield 500 tonnes of PVC. There were no by products or scrap from this further processing of Chlorine. There were no beginning or ending inventories of Caustic Soda, Chlorine or PVC in April.

There is an active market for Chlorine. Inorganic Chemicals could have sold all its April production of Chlorine at ₹1,875 a tonne.

### Required

1. To calculate how the joint cost of ₹25,00,000 would be allocated between Caustic Soda and Chlorine under each of the following methods:
   a. Sales value at split off;
   b. Physical measure (ton); and
   c. Estimated NRV.
2. What is the gross margin percentage of Caustic soda and PVC under the three above methods in requirement?
3. Lifetime Swimming Pool Products offers to purchase 800 tonnes of Chlorine in May, 2000 at ₹1,875 at tonne. This sale would mean that no PVC would be produced in May. How would accepting the offer affect May's operating income?

**[(15 Marks) May 2000]**

### Answer

**1. Statement Showing Allocation of Joint Cost**

| Particulars | Joint Products | |
|---|---|---|
| | Caustic Soda | Chlorine |
| **a.** Allocation of joint cost on the basis of sale value at split off point: | (1,200 × 1,250) | (800 × 1,875) |
| Sale Value of production at split off (production × sales price) | 15,00,000 | 15,00,000 |
| Share of joint cost of ₹25,00,000 in ratio ***(15 : 15)*** | ***12,50,000*** | ***12,50,000*** |
| **b.** Allocation of joint cost on ten basis of physical measure: | | |
| Output at split off point | 1,200 tonnes | 800 tonnes |
| Share of joint cost of ₹25,00,000 in ratio ***(12 : 8)*** | ***15,00,000*** | ***10,00,000*** |
| **c.** Allocation of joint cost on the basis of estimated NRV: | (1,200 × 1,250) | (500 × 5,000) |
| Sale Value of production after further processing (output after further processing × sales price) | 15,00,000 | 25,00,000 |
| Less: Further processing cost | - | 5,00,000 |
| Net Realizable Value (NRV) | 15,00,000 | 20,00,000 |
| Share of joint cost of ₹25,00,000 in ratio ***(15 : 20)*** | ***10,71,429*** | ***14,28,571*** |

**2. Statement of Gross Margin Percentage**

| Particulars | Basic of Apportionment of Joint Cost | | |
|---|---|---|---|
| | Sale Value at split off | Physical measure | Estimated NRV |

| | *C. Soda* | *PVC* | *C. Soda* | *PVC* | *C. Soda* | *PVC* |
|---|---|---|---|---|---|---|
| Sale Value of output after further processing | 15,00,000 | 25,00,000 | 15,00,000 | 25,00,000 | 15,00,000 | 25,00,000 |
| Less: Joint Cost | 12,50,000 | 12,50,000 | 15,00,000 | 10,00,000 | 10,71,429 | 14,28,571 |
| Less: Further Processing Cost (PVC only) | - | 5,00,000 | - | 5,00,000 | - | 5,00,000 |
| ***Gross Margin*** | ***2,50,000*** | ***7,50,000*** | ***NIL*** | ***10,00,000*** | ***4,28,571*** | ***5,71,429*** |
| ***Gross Margin % (Margin ÷ Sales)× 100*** | ***16.67%*** | ***30%*** | ***0%*** | ***40%*** | ***28.57%*** | ***22.86%*** |

### 3. *Analysis of Life Swimming Pool Products:*

| | |
|---|---|
| Sale value of 500 tons of PVC @ ₹5,000 per tonne | 25,00,000 |
| Less: Sale Value of 800 tons of Chlorine | 15,00,000 |
| ***Incremental Revenue*** | ***10,00,000*** |
| Cost of further processing chlorine into PVC | 5,00 000 |
| ***Increase in net income due to further processing of chlorine into PVC*** | ***5,00,000*** |

On the basis of above analysis we find that there is a reduction of operating income in the month of May by ₹5,00,000 when the company accept the after of "Lifetime Swimming Pool Products". Hence, the offer should not be accepted.

### *PYQ 4*

In a chemical manufacturing company, three products A, B and C emerge at a single split off stage in department P. Products A is further processed in department Q, product B in department R and product C in department S. There is no loss in further processing of any of the three products.

***The cost data for a month are as under:***

| | |
|---|---|
| Cost of raw materials introduced in department P | ₹12,68,800 |
| Direct Wages: | |
| Department P | ₹3,84,000 |
| Department Q | ₹96,000 |
| Department R | ₹64,000 |
| Department S | ₹36,000 |

Factory overheads of ₹4,64,000 are to be apportioned to the departments on direct wages basis. During the month under reference, the company sold all three products after processing them further as under:

| ***Products*** | ***A*** | ***B*** | ***C*** |
|---|---|---|---|
| Output sold (in kg) | 44,000 | 40,000 | 20,000 |
| Selling price per kg | ₹32 | ₹24 | ₹16 |

There are no opening or closing stocks. If these products were sold at the split off stage that is without further processing the selling prices would have been ₹20, ₹22 and ₹10 each per kg respectively for A, B and C.

***Required:***

***(i)*** Prepare a statement showing the apportionment of joints cost to joint products.

***(ii)*** Present a statement showing product-wise and total profit for the month under reference as per the company's current processing policy.

***(iii)*** What processing decision should have been taken to improve the profitability of the company?

***(iv)*** Calculate the product-wise and total profit arising from your recommendation in (iii) above.

***[(12 Marks) May 2002]***

**Answer**

### (i) Statement showing the apportionment of Joint Cost to Joint Products

| Particulars | Joints Products | | |
|---|---|---|---|
| | 'A' | 'B' | 'C' |
| Sale value of output at split off point | (44,000 × 20) | (40,000 × 22) | (20,000 × 10) |
| (production in kg × sales price) | 8,80,000 | 8,80,000 | 2,00,000 |
| Share of joint cost of ₹19,60,000 (in 88:88:20) | 8,80,000 | 8,80,000 | 2,00,000 |

### (ii) Statement Showing Product-wise and Total Profit Under Existing Policy

| Particulars | Products | | | Total |
|---|---|---|---|---|
| | 'A' | 'B' | 'C' | |
| Sale value after further processing | (44,000 × 32) | (40,000 × 24) | (20,000 × 16) | |
| (output × sales price per unit) | 14,08,000 | 9,60,000 | 3,20,000 | 26,88,000 |
| Less: Joint cost | 8,80,000 | 8,80,000 | 2,00,000 | 19,60,000 |
| Less: Further processing cost | 1,72,800 | 1,15,200 | 64,800 | 3,52,800 |
| **Profit** | **3,55,200** | **(35,200)** | **55,200** | **3,75,200** |

### (iii) Statement Showing Further Processing Decision

| Products | Incremental revenue | Incremental cost | Situation | Decision |
|---|---|---|---|---|
| A | 14,08,000 – 8,80,000 = 5,28,000 | 1,72,800 | IR > IC | Yes |
| B | 9,60,000 – 8,80,000 = 80,000 | 1,15,200 | IR < IC | No |
| C | 3,20,000 – 2,00,000 = 1,20,000 | 64,800 | IR > IC | Yes |

### (iv) Product-wise and Total Profit Arising Based on the Recommendation

| Particulars | Products | | | Total |
|---|---|---|---|---|
| | 'A' | 'B' | 'C' | |
| Sale value | (44,000 × 32) | (40,000 × 22) | (20,000 × 16) | |
| (output × sales price per unit) | 14,08,000 | 8,80,000 | 3,20,000 | 26,08,000 |
| Less: Joint cost | 8,80,000 | 8,80,000 | 2,00,000 | 19,60,000 |
| Less: Further processing cost | 1,72,800 | - | 64,800 | 2,37,600 |
| **Profit** | **3,55,200** | **Nil** | **55,200** | **4,10,400** |

**Working note:**

**(a) Calculation of joint cost (expenses incurred in department P):**

Cost of raw materials = 12,68,800; Direct wages = 3,84,000

$$\text{Factory overheads} = \frac{\text{Factory overheads}}{\text{Total wages}} \times \text{Wages of Department P}$$

$$= \frac{4,64,000}{3,84,000+96,000+64,000+36,000} \times 3,84,000 = 3,07,200$$

**Joint Cost** = 12,68,800 + 3,84,000 + 3,07,200 = **19,60,000**

**(b) Calculation of further processing cost:**

**Department Q** = Direct wages + Factory overheads

$$= 96,000 + \frac{4,64,000}{5,80,000} \times 96,000 = \mathbf{1,72,800}$$

**Department R** = Direct wages + Factory overheads

$$= 64,000 + \frac{4,64,000}{5,80,000} \times 64,000 = \mathbf{1,15,200}$$

**Department S** = Direct wages + Factory overheads

$$= 36,000 + \frac{4,64,000}{5,80,000} \times 36,000 = \mathbf{64,800}$$

***PYQ 5***

ABC Ltd. operates a simple chemical process to convert a single material into three separate items, referred to here as X, Y and Z. All three end products are separated simultaneously at a single split-off point.

Product X and Y are ready for sale immediately upon split-off without further processing or any other additional costs. Product Z, however is processed further before being sold. There is no available market price for Z at the split-off point. The selling prices quoted here are expected to remain the same in the coming year.

***During 2002-03, the selling prices of the items and the total amounts sold were:***

| | |
|---|---|
| X | 186 tons sold for ₹1,500 per ton |
| Y | 527 tons sold for ₹1,125 per ton |
| Z | 736 tons sold for ₹750 per ton |

The total joint manufacturing costs for the year were ₹6,25,000. An additional ₹3,10,000 was spent to finish product Z. There were no opening inventories of X, Y or Z.

***At the end of the year, the following inventories of complete units were on hand:***

| | |
|---|---|
| X | 180 tons |
| Y | 60 tons |
| Z | 25 tons |

There was no opening or closing work-in-progress.

***Required:***

*i.* Compute the cost of inventories of X, Y and Z for Balance Sheet purposes and cost of goods sold for Income Statement purpose as of March 31, 2003, using:

*(a)* Net realizable value (NRV) method of joint cost allocation.
*(b)* Constant gross-margin percentage method of joint cost allocation.

*ii.* Compare the gross-margin percentages for X, Y and Z using two methods given in requirement *(i)*.

***[(10 Marks) May 2003]***

***Answer***

*i.* ***(a) Statement Showing Cost of Inventories of X, Y, Z and COGS (By Using NRV Method)***

| ***Particulars*** | ***Products*** | | |
|---|---|---|---|
| | ***X*** | ***Y*** | ***Z*** |
| ***(A)*** Allocation of joint cost: | | | |
| Final sale value of total production (output × sales price per unit) | (366 × 1,500) 5,49,000 | (587 × 1,125) 6,60,375 | (761 × 750) 5,70,750 |
| Less: Further processing cost | - | - | 3,10,000 |
| Net realizable value (NRV) | 5,49,000 | 6,60,375 | 2,60,750 |
| ***Joint cost allocated*** | ***2,33,398*** | ***2,80,748*** | ***1,10,854*** |
| ***(B)*** Computation of total cost: | | | |
| Joint cost | 2,33,398 | 2,80,748 | 1,10,854 |
| Further processing cost | - | - | 3,10,000 |
| ***Total cost*** | ***2,33,398*** | ***2,80,748*** | ***4,20,854*** |
| ***(C)*** Valuation of inventories | $2,33,398 \times \frac{180}{366}$ ***1,14,786*** | $2,80,748 \times \frac{60}{587}$ ***28,697*** | $4,20,854 \times \frac{25}{761}$ ***13,826*** |
| ***(D)*** Valuation of COGS | $2,33,398 \times \frac{186}{366}$ ***1,18,612*** | $2,80,748 \times \frac{527}{587}$ ***2,52,051*** | $4,20,854 \times \frac{736}{761}$ ***4,07,028*** |

***(b) Statement Showing Cost of Inventories of X, Y, Z and COGS (By Using Constant Gross Margin Percentage Method)***

| Particulars | Products | | |
|---|---|---|---|
| | X | Y | Z |
| **(A)** Allocation of joint cost: | | | |
| Final sale value of total production | 5,49,000 | 6,60,375 | 5,70,750 |
| Less: Margin @ 47.4756% | 2,60,641 | 3,13,517 | 2,70,967 |
| Less: Further processing cost | - | - | 3,10,000 |
| ***Joint cost allocated*** | ***2,88,359*** | ***3,46,858*** | ***(10,217)*** |
| **(B)** Computation of total cost: | | | |
| Joint cost | 2,88,359 | 3,46,858 | (10,217) |
| Further processing cost | - | - | 3,10,000 |
| ***Total cost*** | ***2,88,359*** | ***3,46,858*** | ***2,99,783*** |
| **(C)** Valuation of inventories | $2,88,359 \times \frac{180}{366}$ ***1,41,816*** | $3,46,858 \times \frac{60}{587}$ ***35,454*** | $2,99,783 \times \frac{25}{761}$ ***9,848*** |
| **(D)** Valuation of COGS | $2,88,359 \times \frac{186}{366}$ ***1,46,543*** | $3,46,858 \times \frac{527}{587}$ ***3,11,404*** | $2,99,783 \times \frac{736}{761}$ ***2,89,935*** |

***Calculation of constant gross margin:***

| | | |
|---|---|---|
| Final sales value of production | (5,49,000 + 6,60,375 + 5,70,750) | 17,80,125 |
| Less: Further processing cost | | 3,10,000 |
| Less: Joint cost | | 6,25,000 |
| Gross margin | | 8,45,125 |
| ***Gross margin percentage*** | ***(8,45,125 / 17,80,125) × 100*** | ***47.4756%*** |

***ii. Statement Showing Gross Margin Percentage***

| Particulars | Products | | |
|---|---|---|---|
| | X | Y | Z |
| **(A)** Under NRV method: | | | |
| Sale value | (186 × 1,500) 2,79,000 | (527 × 1,125) 5,92,875 | (736 × 750) 5,52,000 |
| Less: COGS | 1,18,612 | 2,52,051 | 4,07,028 |
| Gross Margin | 1,60,388 | 3,40,824 | 1,44,972 |
| Gross Margin % | ***57.4867%*** | ***57.4867%*** | ***26.2630%*** |
| **(B)** Under Gross Const. Margin method: | | | |
| Sale value | 2,79,000 | 5,92,875 | 5,52,000 |
| Less: COGS | 1,46,543 | 3,11,404 | 2,89,935 |
| Gross Margin | 1,32,457 | 2,81,471 | 2,62,065 |
| Gross Margin % | ***47.4756%*** | ***47.4756%*** | ***47.4756%*** |

### *PYQ 6*

A company produces two joint products X and Y, from the same basic materials. The processing is completed in three departments. Materials are mixed in department I. At the end of this process, X and Y get separated. After separation X is completed in the department II and Y is finished in department III.

During a period 2,00,000 kgs of raw material were processed in department I at a total cost of ₹8,75,000, and the resultant 60% becomes X and 30% becomes Y and 10% normally lost in processing.

In department II, ⅙ of the quantity received from department I is lost in processing. X is further processed in department II at a cost of ₹1,80,000.

In department III, further new material is added to the material received from department I and weight mixture is doubled, there is no quantity loss in the department and further processing cost (with material cost) is ₹1,50,000.

***The details of sales during the year:***

| | Product X | Product Y |
|---|---|---|
| Quantity sold (kgs) | 90,000 | 1,15,000 |
| Sales price per kg (₹) | 10 | 4 |

There were no opening stocks. If these products are sold at split-off-point the selling price of X and Y would be ₹8 and ₹4 per kg respectively.

***Required:***

***(i)*** Prepare a statement showing the apportionment of joint cost to X and Y in proportion of sales value at split off point.
***(ii)*** Prepare a statement showing the cost per kg of each product indicating joint cost, processing cost and total cost separately.
***(iii)*** Prepare a statement showing the product wise profit for the year.
***(iv)*** On the basis of profits before and after further processing of product X and Y, give your comment that products should be further processed or not.

***[(2+3+2+2 = 9 Marks) May 2005]***

## *Answer*

### *(i) Statement of Apportionment of Joint Cost*
### *(Using Sales Value at Split-off-point Method)*

| *Particulars* | *Product X* | *Product Y* |
|---|---|---|
| Sales value at split-off-point | (1,20,000 × 8)<br>9,60,000 | (60,000 × 4)<br>2,40,000 |
| Share of joint cost of ₹8,75,000 ***(in 4:1)*** | ***7,00,000*** | ***1,75,000*** |

### *(ii) Statement of Cost Per Kg (for Final Output)*

| *Particulars* | *Product X* | *Product Y* |
|---|---|---|
| Joint cost per kg | $\frac{7,00,000}{1,00,000}$ = 7.00 | $\frac{1,75,000}{1,20,000}$ = 1.4583 |
| Further processing cost per kg | $\frac{1,80,000}{1,00,000}$ = 1.80 | $\frac{1,50,000}{1,20,000}$ = 1.250 |
| Total cost per kg | $\frac{8,80,000}{1,00,000}$ = 8.80 | $\frac{3,25,000}{1,20,000}$ = 2.7083 |

### *(iii) Statement of Profit*

| *Particulars* | *Product X* | *Product Y* |
|---|---|---|
| Sales (units sold × sales price per unit) | (90,000 × 10)<br>9,00,000 | (1,15,000 × 4)<br>4,60,000 |
| Less: Total cost @ 8.80/ 2.7083 | (90,000 × 8.80)<br>7,92,000 | (1,15,000 × 2.7083)<br>3,11,458 |
| ***Profit*** | ***1,08,000*** | ***1,48,542*** |

### *(iv) Profitability Statement*
### *(When Products are Sold Before and After Further Processing)*

| *Particulars* | *Product X* | *Product Y* |
|---|---|---|
| ***(A)*** When total output sold at split-off-point: | | |
| Sales Value (units produced × sales price per unit) | (1,20,000 × 8)<br>9,60,000 | (60,000 × 4)<br>2,40,000 |
| Less: Joint cost | 7,00,000 | 1,75,000 |
| ***Profit*** | ***2,60,000*** | ***65,000*** |
| ***(B)*** When total output sold after further processing: | | |
| Sales Value (units produced × sales price per unit) | (1,00,000 × 10)<br>10,00,000 | (1,20,000 × 4)<br>4,80,000 |
| Less: Joint cost | 7,00,000 | 1,75,000 |
| Less: Further processing cost | 1,80,000 | 1,50,000 |
| ***Profit*** | ***1,20,000*** | ***1,55,000*** |
| ***Whether product should be further processed*** | ***No*** | ***Yes*** |

***Working Note:***

**Computation of Quantity Produced**

| Particulars | Department I | Department II | Department III |
|---|---|---|---|
| Input (in kgs) | 2,00,000 | 1,20,000 | 60,000 |
| Weight (lost) or added | (20,000) | (20,000) | 60,000 |
| Total output | **1,80,000** | **1,00,000** | **1,20,000** |

***Note:*** Output of department I has been transferred to departments II and III in proportion of 6 : 3. Production of X at separation point 1,20,000 kgs and of Y 60,000 kgs, while production of X after further processing 1,00,000 kgs and of Y 1,20,000 kgs.

### PYQ 7

A Chemical Company carries on production operation in two processes. The material first passes through Process I, where Product 'A' is produced.

***Following data are given for the month just ended:***

| | |
|---|---|
| Material input quantity | 2,00,000 kgs |
| Opening work-in-progress quantity | 40,000 kgs |
| (Material 100% and conversion 50% complete) | |
| Work completed quantity | 1,60,000 kgs |
| Closing work-in-progress quantity | 30,000 kgs |
| (Material 100% and conversion two-third complete) | |
| Material input cost | ₹75,000 |
| Processing cost | ₹1,02,000 |
| Opening work-in-progress cost | |
| Materials cost | ₹20,000 |
| Processing cost | ₹12,000 |

Normal process loss in quantity may be assumed to be 20% of material input. It has no realizable value. Any quantity of Product 'A' can be sold for ₹1.60 per kg. Alternatively, it can be transferred to Process II for further processing and then sold as Product 'AX' for ₹2 per kg. Further materials are added in Process II, which yield two kgs of product 'AX' for every kg of Product 'A' of Process I. Of the 1,60,000 kgs per month of work completed in Process I, 40,000 kgs are sold as Product 'A' and 1,20,000 kgs are passed through Process II for sale as Product 'AX'. Process II has facilities to handle upto 1,60,000 kgs of Product 'A' per month, if required.

***The monthly costs incurred in Process II (other than the cost of Product 'A') are:***

| | *Input of 1,20,000 Kgs of Product 'A'* | *Input of 1,60,000 Kgs of Product 'A'* |
|---|---|---|
| Materials Cost | ₹1,32,000 | ₹1,76,000 |
| Processing Cost | ₹1,20,000 | ₹1,40,000 |

***Required***

***(a)*** Determine, using the weighted average cost method, the cost per kg of Product 'A' in Process I and value of both work completed and closing work-in-progress for the month just ended.

***(b)*** Is it processing 1,20,000 kgs of Product 'A' further?

***(c)*** Calculate the minimum acceptable selling price per kg, if a potential buyer could be found for additional output of Product 'AX' that could be produced with the remaining Product 'A' quantity.

***[(14 Marks) Nov 2006]***

### Answer

***(a) Statement of Equivalent Production (Average Cost Method)***

| Particulars | Total Units | Materials | | Processing Cost | |
|---|---|---|---|---|---|
| | | % | Unit | % | Unit |
| Units Completed | 1,60,000 | 100 | 1,60,000 | 100 | 1,60,000 |
| Normal loss | 40,000 | - | - | - | - |
| Abnormal Loss | 10,000 | 100 | 10,000 | 100 | 10,000 |
| Closing WIP | 30,000 | 100 | 30,000 | ⅔ | 20,000 |
| **Total** | **2,40,000** | **-** | **2,00,000** | **-** | **1,90,000** |

***Statement of Cost***

| *Elements* | *Cost* | *Equivalent Units* | *Cost Per Unit* |
|---|---|---|---|
| Materials | 20,000 + 75,000 = 95,000 | 2,00,000 | 0.475 |
| Processing Cost | 12,000 + 1,02,000 = 1,14,000 | 1,90,000 | 0.60 |
| | | | ***1.075*** |

***Statement of Evaluation***

| *Particulars* | *Elements* | *Eq. Units* | *Cost Per Unit* | *Total* |
|---|---|---|---|---|
| Units Completed | Materials and Processing cost | 1,60,000 | 1.075 | ***1,72,000*** |
| Abnormal Loss | Materials and Processing cost | 10,000 | 1.075 | ***10,750*** |
| Closing WIP | Materials | 30,000 | 0.475 | 14,250 |
| | Processing cost | 20,000 | 0.60 | 12,000 |
| | | | | ***26,250*** |

***(b) Evaluation of further processing of 1,20,000 kgs of Product A:***

***Calculation of Incremental Cost:***

| | | |
|---|---|---|
| Further Material Cost | = | 1,32,000 |
| Further Processing Cost | = | 1,20,000 |
| Total Incremental Cost | = | ***2,52,000*** |

***Calculation of Incremental revenue:***

| | | |
|---|---|---|
| Sales Value of AX (2,40,000 kgs × 2) | = | 4,80,000 |
| (Input of 1 kg of A provides 2 kgs of AX) | | |
| Sales Value of A (1,20,000 kgs × 1.60) | = | 1,92,000 |
| Total Incremental Revenue | = | ***2,88,000*** |

***Incremental Benefit (2,88,000 – 2,52,000)*** = ***36,000***

***Company should further process 1,20,000 kgs of Product A having incremental net benefit.***

***(c) Cost of processing of 40,000 kgs of Product A:***

| | | |
|---|---|---|
| Sales Value 40,000 kgs of Product A (40,000 kgs × 1.60) | = | 64,000 |
| Incremental Cost to Process 40,000 kgs A | | |
| Incremental Materials Cost (1,76,000 – 1,32,000) | = | 44,000 |
| Incremental Processing Cost (1,40,000 – 1,20,000) | = | 20,000 |
| ***Total*** | = | ***1,28,000*** |
| Production of AX | = | 80,000 kgs |
| ***Minimum selling price (1,28,000 ÷ 80,000 kgs)*** | = | ***₹1.60 per kg*** |

***PYQ 8***

A Company produces two joint products P and Q in 70 : 30 ratio from basic raw materials in department A. The input output ratio of department A is 100 : 85. Product P can be sold at the split of stage or can be processed further at department B and sold as product AR. The input output ratio is 100 : 90 of department B. The department B is created to process product P only and to make it product AR.

***The selling prices per kg are as under:***

| | |
|---|---|
| Product P | ₹85 |
| Product Q | ₹290 |
| Product AR | ₹115 |

***The production will be taken up in the next month.***

| | |
|---|---|
| Raw materials | 8,00,000 Kgs |
| Purchase price | ₹80 per Kg |

| | Department A (In Lakh) | Department B (In Lakh) |
|---|---|---|
| Direct materials | 35.00 | 5.00 |
| Direct labour | 30.00 | 9.00 |
| Variable overheads | 45.00 | 18.00 |
| Fixed overheads | 40.00 | 32.00 |
| ***Total*** | ***150.00*** | ***64.00*** |

***Selling Expenses:***

| | |
|---|---|
| Product P | ₹24.60 lakh |
| Product Q | ₹21.60 lakh |
| Product AR | ₹16.80 lakh |

***Required***

***(i)*** Prepare a statement showing the apportionment of joint costs.

***(ii)*** State whether it is advisable to produce product AR or not.

***[(8 Marks) May 2007]***

## *Answer*

### *(i) Statement Showing Apportionment of Joint Cost*

| *Particulars* | *Product AR (₹in Lakh)* | *Product Q (₹in Lakh)* |
|---|---|---|
| Sales value at split-off-point (P and Q) | (4,76,000 × 85) 404.60 | (2,04,000 × 290) 591.60 |
| Less: Selling expenses if sold at split-off-point | (24.60) | (21.60) |
| Net sales at split-off-point | 380.00 | 570.00 |
| ***Share of joint cost of *₹790 lakh (in 380 : 570)*** | ***316.00*** | ***474.00*** |

### *(ii) Statement Showing Further Processing Decision*

| *Incremental Revenue (₹in Lakh)* | *Incremental Cost (₹in Lakh)* | *Situation* | *Decision* |
|---|---|---|---|
| 492.66 – 404.60 = 88.06 | 64 + 16.80 – 24.60 = 56.20 | IR > IC | Yes |

***Working notes:***

***(a) Calculation of Output:***

| | | | | |
|---|---|---|---|---|
| Input in Department A | = | 8,00,000 kgs | | |
| Yield | = | 85% | | |
| Therefore Output | = | 85% of 8,00,000 kgs | = | 6,80,000 kgs |
| ***Ratio of output for P and Q*** | = | ***70 : 30*** | | |
| Product of P | = | 70% of 6,80,000 kgs | = | 4,76,000 kgs |
| Product of Q | = | 30% of 6,80,000 kgs | = | 2,04,000 kgs |

***(b) Calculation of joint cost:***

| | | |
|---|---|---|
| Raw materials (8,00,000 kgs × ₹80) | = | 640 lakh |
| Process cost of department A | = | 150 lakh |
| ***Joint cost*** | = | ***790 lakh*** |

***(c) Calculation of output of product AR and sale value:***

| | | | | |
|---|---|---|---|---|
| Output | = | 90% of 4,76,000 kgs | = | ***4,28,400 kgs*** |
| Sales | = | 4,28,400 kgs. × ₹115 | = | ***492.66 Lakhs*** |

***PYQ 9***

A company manufactures one main product (M1) and two by-products B1 and B2 for the month of January 2013, following details are available:

***Total Cost upto Separation Point*** ***₹2,12,400***

| Particulars | M1 | B1 | B2 |
|---|---|---|---|
| Cost after separation | - | ₹35,000 | ₹24,000 |
| No. of units produced | 4,000 | 1,800 | 3,000 |
| Selling price per units | ₹100 | ₹40 | ₹30 |
| Estimated net profit as percentage to sales value | - | 20% | 30% |
| Estimated selling expenses as percentage to sales value | 20% | 15% | 15% |

There are no beginning or closing inventories.

***Prepare statement showing:***

***I.*** Allocation of joint cost; and
***II.*** Product-wise and overall profitability of the company for January 2013.

***[(8 Marks) May 2013/May 2015]***

## *Answer*

### *I. Statement of Allocation of Joint Cost*

| Particulars | B1 | B2 |
|---|---|---|
| Sales @ ₹40/₹30 per unit | 72,000 | 90,000 |
| Less: Estimated profit @ 20%/30% | 14,400 | 27,000 |
| Less: Estimated selling expenses @ 15% on sales | 10,800 | 13,500 |
| Less: Further estimated cost (cost after separation) | 35,000 | 24,000 |
| ***Joint Cost*** | ***11,800*** | ***25,500*** |
| Total Joint Cost | | 2,12,400 |
| Less: Joint cost allocable to B1 | | 11,800 |
| Less: Joint cost allocable to B2 | | 25,500 |
| ***Joint Cost allocable to M1*** | | ***1,75,100*** |

### *II. Product-wise & Overall Profitability Statement*

| Particulars | M1 | B1 | B2 | Total |
|---|---|---|---|---|
| Sales | 4,00,000 | 72,000 | 90,000 | 5,62,000 |
| Less: Selling expenses @ 20%/15%/15% | 80,000 | 10,800 | 13,500 | 1,04,300 |
| Less: Cost after separation | Nil | 35,000 | 24,000 | 59,000 |
| Less: Joint cost | 1,75,100 | 11,800 | 25,500 | 2,12,400 |
| ***Profit*** | ***1,44,900*** | ***14,400*** | ***27,000*** | ***1,86,300*** |

## *PYQ 10*

SV Chemicals Limited processes 9,00,000 kgs of raw material in a month purchased at ₹95 per kg in department X. The input output ratio of department X is 100 : 90. Processing of material result in two joint products being produced 'P1' and 'P2' in the ratio of 60 : 40. Product 'P1' can be sold at the split of stage or can be processed further at department Y and sold as a new product 'YP1'. The input output ratio of department Y is 100 : 95. Department Y is utilized only for further processing of product 'P1' to product 'YP1'.

***Individual departmental expenses are as follows:***

| | Department X (In Lakh) | Department Y (In Lakh) |
|---|---|---|
| Direct materials | ₹95.00 | ₹14.00 |
| Direct labour | ₹80.00 | ₹27.00 |
| Variable overheads | ₹100.00 | ₹35.00 |
| Fixed overheads | ₹75.00 | ₹52.00 |
| ***Total*** | ***₹350.00*** | ***₹128.00*** |

***Further, selling expenses to be incurred on three products are:***

| | |
|---|---|
| Product 'P1' | ₹28.38 lakh |
| Product 'P2' | ₹25.00 lakh |
| Product 'YP1' | ₹19.00 lakh |

***The selling prices per kg are as under:***

| | |
|---|---|
| Product 'P1' | ₹110 |
| Product 'P2' | ₹325 |
| Product 'YP1' | ₹150 |

***You are required to:***

***(1)*** Prepare a statement showing the apportionment of joint costs in the ratio of value of sales, net of selling expenses.
***(2)*** Statement showing profitability at split off point.
***(3)*** Statement of profitability of 'YP1'
***(4)*** Would you recommend further processing of 'P1'?

***[(8 Marks) June 2015]***

## *Answer*

| | | | | |
|---|---|---|---|---|
| Input in Department X | = | 9,00,000 kgs | | |
| Yield | = | 90% | | |
| Therefore Output | = | 90% of 9,00,000 kgs | = | 8,10,000 kgs |
| ***Ratio of output for 'P1' and 'P2'*** | = | ***60 : 40*** | | |
| Product of 'P1' | = | 60% of 8,10,000 kgs | = | 4,86,000 kgs |
| Product of 'P2' | = | 40% of 8,10,000 kgs | = | 3,24,000 kgs |

### *(1) Statement Showing Apportionment of Joint Cost*

| ***Particulars*** | ***Product 'P1' (₹in Lakh)*** | ***Product 'P2' (₹in Lakh)*** |
|---|---|---|
| Sales value at split-off-point | (4,86,000 × 110) 534.60 | (3,24,000 × 325) 1,053.00 |
| Less: Selling expenses if sold at split-off-point | (28.38) | (25.00) |
| Net sales at split-off-point | 506.22 | 1,028.00 |
| ***Share of joint cost of *₹1,205 lakh (in 506.22 : 1,028)*** | ***397.59*** | ***807.41*** |

**** Calculation of joint cost:***

| | | |
|---|---|---|
| Raw materials (9,00,000 kgs × ₹95) | = | 855 lakh |
| Process cost of department X | = | 350 lakh |
| ***Joint cost*** | = | ***1,205 lakh*** |

### *(2) Statement of Profitability at Split Off Point*

| ***Particulars*** | ***Product 'P1' (₹in Lakh)*** | ***Product 'P2' (₹in Lakh)*** |
|---|---|---|
| Sales value at split-off-point | (4,86,000 × 110) 534.60 | (3,24,000 × 325) 1,053.00 |
| Less: Selling expenses if sold at split-off-point | (28.38) | (25.00) |
| Less: Joint Cost | (397.59) | (807.41) |
| ***Profit*** | ***108.63*** | ***220.59*** |

### *(3) Statement of Profitability of 'YP1'*

| ***Particulars*** | ***Product 'YP1' (₹in Lakh)*** |
|---|---|
| Sales value (4,61,700 × 150) | 692.55 |
| Less: Further processing cost in department Y | (128.00) |
| Less: Selling expenses if sold after further processing | (19.00) |
| Less: Joint Cost | (397.59) |
| ***Profit*** | ***147.96*** |

***Calculation of output of product 'YP1':***

| | | | | |
|---|---|---|---|---|
| Output | = | 95% of 4,86,000 kgs | = | ***4,61,700 kgs*** |

***(4) Further Processing Decision:*** Product 'P1' should be sold after further processing as product 'YP1' having higher profit.

### *PYQ 11*
A factory producing article A also produces a by-product B which is further processed into finished product.

***The joint costs of manufacture are given below:***

| | |
|---|---|
| Material | ₹5,000 |
| Labour | ₹3,000 |
| Overheads | ₹2,000 |
| | ***₹10,000*** |

***Subsequent costs are given below:***

| | ***A*** | ***B*** |
|---|---|---|
| Material | ₹3,000 | ₹1,500 |
| Labour | ₹1,400 | ₹1,000 |
| Overheads | ₹600 | ₹500 |
| | ***₹5,000*** | ***₹3,000*** |

***Selling Price:***

| | |
|---|---|
| Product A | ₹16,000 |
| Product B | ₹8,000 |

***Estimated profits on selling prices:***

| | |
|---|---|
| Product A | 25% |
| Product B | 20% |

***Assume that selling and distributing expenses are in proportion of sales prices. Show how you would apportion joint costs of manufacture and prepare a statement showing cost of production of A and B.***

***[(8 Marks) May 2016]***

### *Answer*

***Statement Showing Apportionment of Joint Cost***

| ***Particulars*** | ***Article A*** | ***By-product B*** |
|---|---|---|
| Sales value | 16,000 | 8,000 |
| Less: Profit @ 25% of 16,000 & 20% of 8,000 | 4,000 | 1,600 |
| Less: Selling expenses (400 in 16 : 8) | 267 | 133 |
| Less: Subsequent cost | 5,000 | 3,000 |
| ***Joint cost*** | ***6,733*** | ***3,267*** |

**** Calculation of selling expenses:***

| | | |
|---|---|---|
| Selling expenses | = | Total sales – Total profit – Total subsequent cost – Total joint cost |
| | = | (16,000 + 8,000) – (4,000 + 1,600) – (5,000 + 3,000) – 10,000 |
| | = | ***400*** |

***Statement Showing Cost of Production***

| ***Particulars*** | ***Article A*** | ***By-product B*** |
|---|---|---|
| Joint cost | 6,733 | 3,267 |
| Subsequent cost | 5,000 | 3,000 |
| ***Cost of Production*** | ***11,733*** | ***6,267*** |

### *PYQ 12*
A Ltd produces 'M' as a main product and gets two by products 'P' and 'Q' in the course of processing. Following information are available for the month of October 2017:

| Particulars | M | P | Q |
|---|---|---|---|
| Cost after separation | - | ₹60,000 | ₹30,000 |
| No. of units produced | 4,500 | 2,500 | 1,500 |
| Selling price per units | ₹170 | ₹80 | ₹50 |
| Estimated net profit as percentage to sales value | - | 30% | 25% |

The joint cost upto separation point amounts to ₹2,50,000. Selling expenses amounting to 85,000 are to be apportioned to the three products in the ratio of sales units. There are no beginning or closing inventories.

***Prepare statement showing:***

*(i)* Allocation of joint cost;

*(ii)* Product-wise and overall profitability and

*(iii)* Advise the company regarding results if the by product 'P' is not further processed and is sold at the point of separation at ₹60 per unit without incurring selling expenses.

***[(8 Marks) Nov 2017]***

## Answer

### (i) Statement of Allocation of Joint Cost

| Particulars | P | Q |
|---|---|---|
| Sales @ ₹80/₹50 per unit | 2,00,000 | 75,000 |
| Less: Estimated profit @ 30%/25% | 60,000 | 18,750 |
| Less: Estimated selling 85,000 in (4,500 : 2,500 : 1,500) | 25,000 | 15,000 |
| Less: Further estimated cost (cost after separation) | 60,000 | 30,000 |
| ***Joint Cost*** | ***55,000*** | ***11,250*** |
| Total Joint Cost | | 2,50,000 |
| Less: Joint cost allocable to P | | 55,000 |
| Less: Joint cost allocable to Q | | 11,250 |
| ***Joint Cost allocable to M*** | | ***1,83,750*** |

### (ii) Product-wise & Overall Profitability Statement

| Particulars | M | P | Q | Total |
|---|---|---|---|---|
| Sales | 7,65,000 | 2,00,000 | 75,000 | 10,40,000 |
| Less: Selling expenses | 45,000 | 25,000 | 15,000 | 85,000 |
| Less: Cost after separation | Nil | 60,000 | 30,000 | 90,000 |
| Less: Joint cost | 1,83,750 | 55,000 | 11,250 | 2,50,000 |
| ***Profit*** | ***5,36,250*** | ***60,000*** | ***18,750*** | ***6,15,000*** |

***(iii) Further processing decision in respect of by product 'P':***

| | | | | |
|---|---|---|---|---|
| Reduction in revenue | = | 2,500 units (₹80 - ₹60) | = | ₹50,000 |
| Reduction in cost | = | Further processing cost + Selling expenses | | |
| | = | 60,000 + 25,000 | = | ₹85,000 |

***Decision:*** Since, reduction in cost is higher than reduction in revenue therefore, By product 'P' should be sold at split of stage (by following such decision company can increase its income by ₹35,000).

## PYQ 13

A Factory is engaged in the production of a chemical BOMEX and in the course of its manufacture, a by- product CROMEX is produced which after further processing has commercial value. For the month of April 2019, the following are the summarised cost data.

| | *Joint Expenses* | *Separate Expenses* | |
|---|---|---|---|
| | | ***BOMEX*** | ***CROMEX*** |
| Materials | 1,00,000 | 6,000 | 4,000 |
| Labour | 50,000 | 20,000 | 18,000 |
| Overheads | 30,000 | 10,000 | 6,000 |
| Selling price per unit | | 100 | 40 |
| Estimated profit per unit on sale of CROMEX | | | 5 |
| No. of units produced | | 2,000 | 2,000 |

The factory uses net realizable value method for apportionment of joint cost to by-products.

***You are required to prepare statements showing:***

***(1)*** Joint cost allocable to CROMEX.

***(2)*** Product wise and overall profitability of the factory for April 2019.

***[(5 Marks) May 2019]***

***Answer***

***(1) Statement of Allocation of Joint Cost to CROMEX***

| Particulars | Amount (₹) | Amount (₹) |
|---|---|---|
| Number of units produced | 2,000 | 2,000 |
| Sale price per unit | ₹100 | ₹40 |
| Sales value | 2,00,000 | 80,000 |
| Less: Separate cost | 36,000 | 28,000 |
| ***Net realizable value*** | ***1,64,000*** | ***52,000*** |
| ***Joint Cost ₹1,80,000 in 1,64,000 : 52,000*** | ***1,36,667*** | ***43,333*** |

***(2) Product-wise & Overall Profitability Statement***

| Particulars | BOMEX | CROMEX | Total |
|---|---|---|---|
| Sales value | 2,00,000 | 80,000 | 2,80,000 |
| Less: Separate cost | 36,000 | 28,000 | 64,000 |
| Less: Joint cost | 1,36,667 | 43,333 | 1,80,000 |
| ***Profit*** | ***27,333*** | ***8,667*** | ***36,000*** |

***PYQ 14***

A factory produces two, 'A' and 'B' from a single process. The joint processing costs during a particular month are:

| | |
|---|---|
| Direct material | ₹30,000 |
| Direct labour | ₹9,600 |
| Variable overheads | ₹12,000 |
| Fixed overheads | ₹32,000 |

Sales: A – 100 units @ ₹600 per unit; B – 120units @ ₹200 per unit.

***Apportion joints costs on the basis of:***

***(1)*** Physical quantity of each product.

***(2)*** Contribution margin method, and

***(3)*** Determine profit or loss under both the methods. ***[(5 Marks) Nov 2019]***

***Answer***

***(1) Statement Showing Apportionment of Joint Cost***
***(Based on Physical Quantity Method)***

| Particulars | Product A | Product B |
|---|---|---|
| Number of units | 100 | 120 |
| ***Apportionment of Joint Cost ₹83,600 in 100 : 120*** | ***₹38,000*** | ***₹45,600*** |

***(2) Statement Showing Apportionment of Joint Cost***
***(Based on Contribution Margin Method)***

| Particulars | Product A | Product B |
|---|---|---|
| Number of units | 100 | 120 |
| ***(A) Variable Joint Cost ₹51,600 in 100 : 120*** | ***₹23,455*** | ***₹28,145*** |
| Sales | ₹60,000 | ₹24,000 |
| Less: Variable joint cost | ₹23,455 | ₹28,145 |
| ***Contribution*** | ***₹36,545*** | ***(₹4,145)*** |
| ***(B) Fixed Joint Cost ₹32,000 to Product A only*** | ***₹32,000*** | ***-*** |
| ***(C) Total Joint Cost (A) + (B)*** | ***₹55,455*** | ***₹28,145*** |

***Note:*** * The fixed cost of ₹32,000 is to be apportioned over the joint products A and B in the ratio of their contribution margin but contribution margin of Product B is Negative so fixed cost will be charged to Product A only.

***(3) Statement Showing Profit under Both Methods***

| Particulars | Product A | Product B |
|---|---|---|
| ***(1) Profit under physical quantity method:*** | | |
| Sales | 60,000 | 24,000 |
| Less: Joint cost | 38,000 | 45,600 |
| ***Profit/ (loss)*** | ***₹22,000*** | ***(₹21,600)*** |
| ***(2) Profit under contribution margin method:*** | | |
| Sales | 60,000 | 24,000 |
| Less: Joint cost | 55,455 | 28,145 |
| ***Profit/ (loss)*** | ***₹4,545*** | ***(₹4,145)*** |

***Working note:***

| | | | | |
|---|---|---|---|---|
| Variable joint cost | = | Direct material + Direct wages + Variable overheads | | |
| | = | ₹30,000 + ₹9,600 + ₹12,000 | = | ***₹51,600*** |
| Total joint cost | = | Variable joint cost + Fixed overheads | | |
| | = | ₹51,600 + ₹32,000 | = | ***₹83,600*** |

### *PYQ 15*

A company's plant processes 6,750 units of raw material in a month to produce two products 'M' and 'N'.

***The process yield is as under:***

| | |
|---|---|
| Product M | 80% |
| Product N | 12% |
| Process Loss | 8% |

Processing cost is ₹2,25,000 of which labour cost is accounted for 66%. Labour is chargeable to products 'M' and 'N' in ratio of 100 : 80. The cost of material is ₹80 per unit

***Prepare a comprehensive cost statement for each products showing:***

***(i)*** Apportionment of joint cost among products 'M' and 'N' and
***(ii)*** Total cost of the products 'M' and 'N'

***[(5 Marks) Nov 2020]***

### *Answer*

***Statement Showing Apportionment of Joint Cost and Total Cost of 'M' and 'N'***

| Particulars | | Basis | 'M' | 'N' | Total |
|---|---|---|---|---|---|
| Material | (6,750 × ₹80) | 5,400 : 810 | 4,69,565 | 70,435 | 5,40,000 |
| Processing Cost except Labour | (2,25,000 × 34%) | 5,400 : 810 | 66,522 | 9,978 | 76,500 |
| Labour | (2,25,000 × 66%) | 100 : 80 | 82,500 | 66,000 | 1,48,500 |
| ***Joint Cost*** | | | ***₹6,18,587*** | ***₹1,46,413*** | ***₹7,65,000*** |

***Note:*** Cost of materials and processing cost except labour are apportioned between M and N in proportion of physical units i.e. 5,400 units of M (80% of 6,750) and 810 units of N (12% of 6,750).

### *PYQ 16*

Mayura Chemicals Ltd buys a particular raw material at ₹8 per litre. At the end of the processing in Department 1, this raw material splits-off into products X, Y and Z. Product X is sold at the split-off point, with no further processing. Products Y and Z require further processing before they can be sold. Product Y is processed in Department 2, and Product Z is processed in Department 3.

***Following is a summary of the costs and other related data for the year 2019-20:***

| Particulars | Departments | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Cost of Raw Material | ₹4,80,000 | - | - |
| Direct Labour | ₹70,000 | ₹4,50,000 | ₹6,50,000 |
| Manufacturing Overheads | ₹48,000 | ₹2,10,000 | ₹4,50,000 |
| | Products | | |
| | X | Y | Z |
| Sales (Litres) | 10,000 | 15,000 | 22,500 |
| Closing Inventory (Litres) | 5,000 | - | 7,500 |
| Sale price per litre (₹) | 30 | 64 | 50 |

There were no opening and closing inventories of basic raw materials at the beginning as well as at the end of the year. All finished goods inventory in litres was complete as to processing. The company uses the Net realisable value method of allocating joint costs.

***You are required to prepare:***

**(1)** Schedule showing the allocation of joint costs.
**(2)** Calculate the Cost of goods sold of each product and the cost of each item in Inventory.
**(3)** A comparative statement of Gross profit.

***[(10 Marks) Jan 2021]***

## Answer

### (1) Statement of Allocation of Joint Cost

| Particulars | X | Y | Z | Total |
|---|---|---|---|---|
| Production in litres (Sales + Closing Inventory) | 15,000 | 15,000 | 30,000 | - |
| Sale price per litre | ₹30 | ₹64 | ₹50 | - |
| Sales value of total production (in ₹) | 4,50,000 | 9,60,000 | 15,00,000 | 29,10,000 |
| Less: Further cost (in ₹): | | | | |
| Cost of Dept. 2 (4,50,000 + 2,10,000) | - | (6,60,000) | - | (6,60,000) |
| Cost of Dept. 3 (6,50,000 + 4,50,000) | - | - | (11,00,000) | (11,00,000) |
| ***Net realizable value (in ₹)*** | ***4,50,000*** | ***3,00,000*** | ***4,00,000*** | ***11,50,000*** |
| ***Joint Cost ₹5,98,000* in 45 : 30 : 40*** | ***2,34,000*** | ***1,56,000*** | ***2,08,000*** | ***5,98,000*** |

****Joint cost*** = Cost of dept. 1 = ₹4,80,000 + ₹70,000 + ₹48,000 = ***₹5,98,000***

### (2) Statement of Cost of Goods Sold and Cost of Inventory

| Particulars | X (₹) | Y (₹) | Z (₹) | Total (₹) |
|---|---|---|---|---|
| Joint Cost | 2,34,000 | 1,56,000 | 2,08,000 | 5,98,000 |
| Add: Further cost: | - | 6,60,000 | 11,00,000 | 17,60,000 |
| ***Total Cost*** | ***2,34,000*** | ***8,16,000*** | ***13,08,000*** | ***23,58,000*** |
| ***Cost of Goods Sold*** | ***1,56,000*** $\left(2{,}34{,}000 \times \frac{10{,}000}{15{,}000}\right)$ | ***8,16,000*** | ***9,81,000*** $\left(13{,}08{,}000 \times \frac{22{,}500}{30{,}000}\right)$ | ***19,53,000*** |
| ***Closing Inventory*** | ***78,000*** $\left(2{,}34{,}000 \times \frac{5{,}000}{15{,}000}\right)$ | - | ***3,27,000*** $\left(13{,}08{,}000 \times \frac{7{,}500}{30{,}000}\right)$ | ***4,05,000*** |

### (3) Statement of Gross Profit

| Particulars | X | Y | Z | Total |
|---|---|---|---|---|
| Sales | ₹3,00,000 (10,000 × ₹30) | ₹9,60,000 (15,000 × ₹64) | ₹11,25,000 (22,500 × ₹50) | ₹23,85,000 |
| Less: Cost of Goods Sold | ₹1,56,000 | ₹8,16,000 | ₹9,81,000 | ₹19,53,000 |
| ***Gross Profit*** | ***₹1,44,000*** | ***₹1,44,000*** | ***₹1,44,000*** | ***₹4,32,000*** |

### *PYQ 17*

OPR Ltd. purchases crude vegetable oil. It does refining of the same. The refining process results in four products at split-off point: S, P, N and A. Product 'A' is fully processed at split-off point. Product S, P and N can be individually further refined into SK, PM, and NL respectively. The joint cost of purchasing the crude vegetable oil and processing it were ₹40,000. Other details are as follows:

| *Products* | *Further processing cost (₹)* | *Sales at split off point (₹)* | *Sales after further processing (₹)* |
|---|---|---|---|
| S | 80,000 | 20,000 | 1,20,000 |
| P | 32,000 | 12,000 | 40,000 |
| N | 36,000 | 28,000 | 48,000 |
| A | - | 20,000 | - |

***You are required to identify the products which can be further processed for maximizing profits and make suitable suggestions.***

***[(5 Marks) July 2021]***

### *Answer*

***Statement Showing Further Processing Decision***

| *Product* | *Calculation Incremental Revenue and Incremental Cost* | *Status* | *Decision* |
|---|---|---|---|
| ***S*** | IR = 1,20,000 – 20,000 = 1,00,000<br>IC = 80,000 = 80,000 | IR > IC | ***Yes*** |
| ***P*** | IR = 40,000 – 12,000 = 28,000<br>IC = 32,000 = 32,000 | IR < IC | ***No*** |
| ***N*** | IR = 48,000 – 28,000 = 20,000<br>IC = 36,000 = 36,000 | IR < IC | ***No*** |

***Suggestion:*** Product S should be processed further and Product P, N and A at split off point to maximize profit.

### *PYQ 18*

RST Limited produces three joint products X, Y and Z. The products are processed further. Pre-separation costs are apportioned on the basis of weight of output of each joint product. The following data are provided for the month of April, 2022.

Cost incurred up to separation point: ₹10,000

| | *Product X* | *Product Y* | *Product Z* |
|---|---|---|---|
| Output (in Litre) | 100 | 70 | 80 |
| Cost incurred after separation point | 2,000 | 1,200 | 800 |
| Selling Price per Litre: | | | |
| After further processing | 50 | 80 | 60 |
| At pre-separation point (estimated) | 25 | 70 | 45 |

***You are required to:***

***(a)*** Prepare a statement showing profit or loss made by each product after further processing using the presently adopted method of apportionment of pre-separation cost.

***(b)*** Advise the management whether, on purely financial consideration, the three products are to be processed further or not.

***[(5 Marks) May 2022]***

### *Answer*

***(a) Statement Showing Profit or Loss made by each Product after Further Processing***

| *Particulars* | *Product X* | *Product Y* | *Product Z* |
|---|---|---|---|
| Output in units | 100 | 70 | 80 |
| Sales after further processing (₹)<br>Less: Further processing cost (₹)<br>Less: Joint cost (₹10,000 in proportion of 100:70:80) | 5,000<br>(2,000)<br>(4,000) | 5,600<br>(1,200)<br>(2,800) | 4,800<br>(800)<br>(3,200) |
| ***Profit/(Loss) (₹)*** | ***(1,000)*** | ***1,600*** | ***800*** |

***(b) Further Processing Decision***

| Products | Incremental revenue | Incremental cost | Situation | Decision |
|---|---|---|---|---|
| X | 100 (₹50 - ₹25) = ₹2,500 | ₹2,000 | IR > IC | Yes |
| Y | 70 (₹80 - ₹70) = ₹700 | ₹1,200 | IR < IC | No |
| Z | 80 (₹60 - ₹45) = ₹1,200 | ₹800 | IR > IC | Yes |

***Advise:*** It is advisable to further process only product X and Z and to sale product Y at the point of separation.

### *PYQ 19*

ASR Ltd mainly produces Product 'L' and gets a by-Product 'M' out of a joint process. The net realizable value of the by-product is used to reduce the joint production costs before the joint costs are allocated to the main product. During the month of October 2022, company incurred joint production costs of ₹4,00,000. The main Product 'L' is not marketable at the spilt off point. Thus, it has to be processed further. Details of company's operation are as under:

| Particulars | Product L | By- Product M |
|---|---|---|
| Production (units) | 10,000 | 200 |
| Selling pricing per kg | ₹45 | ₹5 |
| Further Processing cost | ₹1,01,000 | - |

***You are required to find out:***

***(a)*** Profit earned from Product 'L'

***(b)*** Selling price per kg of product 'L', if the company wishes to earn a profit of ₹1,00,000 from the above production.

***[(5 Marks) Nov 2022]***

### *Answer*

***(a) Statement Showing Profit Earned from Product 'L'***

| Particulars | Amount |
|---|---|
| Sales Value of Product 'L' (10,000 × ₹45) | 4,50,000 |
| Less: Further Processing Cost | (1,01,000) |
| Less: Net Joint Cost (₹4,00,000 – 200 × ₹5) | (3,99,000) |
| ***Profit*** | ***(50,000)*** |

***(b) Statement Showing Selling Price of Product 'L'***

| Particulars | Amount |
|---|---|
| Further Processing Cost | 1,01,000 |
| Add: Net Joint Cost (₹4,00,000 – 200 × ₹5) | 3,99,000 |
| Add: Desired Profit | 1,00,000 |
| Sales Value | 6,00,000 |
| ***Selling Price (₹6,00,000 ÷ 10,000 units)*** | ***₹60*** |

### *PYQ 20*

ABC Company produces a Product 'X' that passes through three processes: R, S and T. Three types of raw materials, viz., J, K, and L are used in the ratio of 40:40:20 in process R. The output of each process is transferred to next process. Process loss is 10% of total input in each process. At the stage of output in process T, a by-product 'Z' is emerging and the ratio of the main product 'X' to the by-product 'Z' is 80: 20. The selling price of product 'X' is ₹ 60 per kg. The company produced 14,580 kgs of product 'X'.

Material price: Material J @ ₹15 per kg; Material K @ ₹9 per kg; Material L @ ₹7 per kg. Process costs are as follows:

| Process | Variable cost per kg (₹) | Fixed cost of Input (₹) |
|---|---|---|
| R | 5.00 | 42,000 |
| S | 4.50 | 5,000 |
| T | 3.40 | 4,800 |

The by-product 'Z' cannot be processed further and can be sold at ₹30 per kg at the split-off stage. There is no realizable value of process losses at any stage.

***Present a statement showing the apportionment of joint costs on the basis of the sales value of product 'X' and by-product 'Z' at the split-off point and the profitability of product 'X' and by-product 'Z'.***
***[(10 Marks) May 2023]***

## Answer

### Statement Showing Apportionment of Joint Cost and Profitability

| Particulars | Product X | By-Product Z |
|---|---|---|
| Number of units produced at split off point (in kg) | 14,580 | 3,645 |
| Market value at separation point per kg | ₹60 | ₹30 |
| Total market value at separation point | ₹8,74,800 | ₹1,09,350 |
| ***Apportionment of Joint Cost ₹6,21,900 in sales ratio*** | ***₹5,52,800*** | ***₹69,100*** |
| ***Profit (Sales value – Joint cost)*** | ***₹3,22,000*** | ***₹40,250*** |

### Working Notes:

**(a)** Output of Product X at split off point = 14,580 kg
∴ Output of By-product Z = (14,580 ÷ 80) × 20 = 3,645 kgs

**(b)** Input of raw material into each process:

Output of Process T = 14,580 + 3,645 = 18,225 kgs
Input of process T = 18,225 ÷ 90% = 20,250 kgs
Input of Process S = 20,250 ÷ 90% = 22,500 kgs
Input of Process R = 22,500 ÷ 90% = 25,000 kgs

**(c)** Calculation of Joint Cost:

| Particulars | Process R | Process S | Process T | Total |
|---|---|---|---|---|
| Material input (in kg) | 25,000 | 22,500 | 20,250 | - |
| Material cost: | | | | |
| Material J (25,000 × 40% × ₹15) | 1,50,000 | - | - | 1,50,000 |
| Material K (25,000 × 40% × ₹9) | 90,000 | - | - | 90,000 |
| Material L (25,000 × 20% × ₹7) | 35,000 | - | - | 35,000 |
| Variable cost @ ₹5, ₹4.50, ₹3.40 per kg | 1,25,000 | 1,01,250 | 68,850 | 2,95,100 |
| Fixed cost | 42,000 | 5,000 | 4,800 | 51,800 |
| ***Joint Cost*** | ***4,42,000*** | ***1,06,250*** | ***73,650*** | ***6,21,900*** |

# SUGGESTED REVISION

| Ques. No. | Observations or KEY Points (Note down during revisions) | Page No. of Practical Register | 1st & 2nd Revision | 3rd, 4th & 5th Revision | Revision during Exams |
|---|---|---|---|---|---|
| BQ (Book Questions covering Study Module of ICAI, PM, RTP's, MTP's and Important Questions) | | | | | |
| 1 | | | Y | Y | - |
| 2 | | | Y | Y | - |
| 3 | | | Y | Y | - |
| 4 | | | Y | Y | - |
| 5 | | | Y | Y | - |
| 6 | | | Y | Y | - |
| 7 | | | Y | Y | - |
| 8 | | | Y | Y | - |
| 9 | | | Y | Y | Y |
| 10 | | | Y | Y | Y |
| 11 | | | Y | - | - |
| 12 | | | Y | Y | - |
| 13 | | | Y | Y | - |
| 14 | | | Y | Y | Y |
| 15 | | | Y | - | - |
| 16 | | | Y | Y | Y |
| 17 | | | Y | Y | Y |
| 18 | | | Y | Y | - |
| 19 | | | Y | Y | Y |
| 20 | | | Y | Y | Y |
| 21 | | | Y | Y | Y |
| 22 | | | Y | Y | - |
| 23 | | | Y | Y | Y |
| 24 | | | Y | Y | Y |
| 25 | | | Y | Y | - |
| PYQ (Past Year Questions) | | | | | |
| 1 | | | Y | - | - |
| 2 | | | Y | Y | - |
| 3 | | | Y | Y | Y |
| 4 | | | Y | Y | Y |
| 5 | | | Y | Y | Y |
| 6 | | | Y | Y | Y |
| 7 | | | Y | Y | - |
| 8 | | | Y | Y | Y |
| 9 | | | Y | Y | Y |
| 10 | | | Y | Y | Y |
| 11 | | | Y | - | - |
| 12 | | | Y | - | - |
| 13 | | | Y | - | - |
| 14 | | | Y | Y | Y |
| 15 | | | Y | Y | - |
| 16 | | | Y | Y | Y |
| 17 | | | Y | - | - |
| 18 | | | Y | Y | - |
| 19 | | | Y | Y | - |
| 20 | | | Y | Y | Y |

# *CHAPTER - 11*

# *BUDGETS & BUDGETARY CONTROL*

## *LEARNING OBJECTIVES*

***When you have finished studying this chapter, you should be able to***

- ***State the meaning of budget and budgetary control***
- ***Essentials of budget.***
- ***Discuss the objectives and importance of budget and budgetary control.***
- ***Describe the process of preparing budgets.***
- ***List the different types of budgets.***
- ***Differentiate between fixed and flexible budget.***
- ***Prepare fixed and flexible budget.***

# FLEXIBLE BUDGET

## BQ 1

A factory which expects to operate 7,000 hours, i.e., at 70% level of activity, furnishes details of expenses as under:

| | |
|---|---|
| Variable expenses | ₹1,260 |
| Semi-variable expenses | ₹1,200 |
| Fixed expenses | ₹1,800 |

The semi-variable expenses go up by 10% between 85% and 95% activity and by 20% above 95% activity.

***Construct a flexible budget for 70, 80, 90 and 100 percent activities. Also calculate recovery rate per hour.***

## Answer

***Flexible Budget***

| Particulars | 70% | 80% | 90% | 100% |
|---|---|---|---|---|
| ***Operating Hours*** | ***7,000*** | ***8,000*** | ***9,000*** | ***10,000*** |
| Variable Expenses | 1,260 | 1,440 | 1,620 | 1,800 |
| Semi Variable Expenses | 1,200 | 1,200 | 1,320 | 1,440 |
| Fixed Expense | 1,800 | 1,800 | 1,800 | 1,800 |
| ***Total Cost*** | ***₹4,260*** | ***₹4,440*** | ***₹4,740*** | ***₹5,040*** |
| ***Recovery Rate (Total Cost ÷ Hours)*** | ***₹0.61*** | ***₹0.56*** | ***₹0.53*** | ***₹0.50*** |

## BQ 2

Gemini Steel Ltd. manufacturers a single product for which market demand exist for an additional quantity. Present sales are of ₹60,000 per month utilizes only 60% capacity of the plant. Marketing manager assured that with the reduction of 10% in the price he would be in a position to increase the sale by about 25% to 30%.

***The following data are available:***

| | | |
|---|---|---|
| ***(1)*** | Selling price | ₹10 per unit |
| ***(2)*** | Variable cost | ₹3 per unit |
| ***(3)*** | Semi variable cost | ₹6,000 fixed + ₹0.50 per unit |
| ***(4)*** | Fixed cost | ₹20,000 at present level and (estimated to be ₹24,000 at 80% output) |

***You are required to prepare the following statements:***

***(a)*** The operating profits at (a) 60% (b) 70% (c) 80% levels at current selling prices.

***(b)*** The operating profits at proposed selling price at the above levels.

## Answer

***(a) Flexible Budget***

| Particulars | 60% | 70% | 80% |
|---|---|---|---|
| ***Number of units*** | ***6,000*** | ***7,000*** | ***8,000*** |
| Variable cost @ ₹3 per unit | 18,000 | 21,000 | 24,000 |
| Semi variable cost: | | | |
| Variable @ ₹0.50 per unit | 3,000 | 3,500 | 4,000 |
| Fixed | 6,000 | 6,000 | 6,000 |
| Fixed cost | 20,000 | 20,000 | 24,000 |
| ***Total Cost*** | ***47,000*** | ***50,500*** | ***58,000*** |
| ***Add: Profit (b.f.)*** | ***13,000*** | ***19,500*** | ***22,000*** |
| ***Sales @ ₹10 per unit*** | ***60,000*** | ***70,000*** | ***80,000*** |

**(b) Flexible Budget**

| Particulars | 60% | 70% | 80% |
|---|---|---|---|
| **Number of units** | **6,000** | **7,000** | **8,000** |
| Variable cost @ ₹3 per unit | 18,000 | 21,000 | 24,000 |
| Semi variable cost: | | | |
| Variable @ ₹0.50 per unit | 3,000 | 3,500 | 4,000 |
| Fixed | 6,000 | 6,000 | 6,000 |
| Fixed cost | 20,000 | 20,000 | 24,000 |
| **Total Cost** | **47,000** | **50,500** | **58,000** |
| **Add: Profit (b.f.)** | **7,000** | **12,500** | **14,000** |
| **Sales @ ₹9 per unit** | **54,000** | **63,000** | **72,000** |

## BQ 3

A department of Company X attains sale of ₹6,00,000 at 80 percent of its normal capacity and its expenses are given below:

| | |
|---|---|
| ***Administration Costs:*** | |
| Office Salaries | 90,000 |
| General Expenses | 2 percent of sales |
| Depreciation | 7,500 |
| Rates and taxes | 8,750 |
| ***Selling Costs:*** | |
| Salaries | 8 percent of sales |
| Travelling expenses | 2 percent of sales |
| Sales office expenses | 1 percent of sales |
| General expenses | 1 percent of sales |
| ***Distribution costs:*** | |
| Wages | 15,000 |
| Rent | 1 percent of sales |
| Other expenses | 4 percent of sales |

***Draw up flexible administration, selling and distribution costs budget, operating at 90 per cent, 100 per cent and 110 per cent of normal capacity.***

## Answer

**Flexible Budget**

| Particulars | 80% | 90% | 100% | 110% |
|---|---|---|---|---|
| Sales in ₹ | 6,00,000 | 6,75,000 | 7,50,000 | 8,25,000 |
| ***(A) Administration cost:*** | | | | |
| Office salaries (fixed) | 90,000 | 90,000 | 90,000 | 90,000 |
| General expenses (2% of sales) | 12,000 | 13,500 | 15,000 | 16,500 |
| Depreciation (fixed) | 7,500 | 7,500 | 7,500 | 7,500 |
| Rent and rates (fixed) | 8,750 | 8,750 | 8,750 | 8,750 |
| ***Total (A)*** | ***1,18,250*** | ***1,19,750*** | ***1,21,250*** | ***1,22,750*** |
| ***(B) Selling cost:*** | | | | |
| Salaries (8% of sales) | 48,000 | 54,000 | 60,000 | 66,000 |
| Travelling expenses (2% of sales) | 12,000 | 13,500 | 15,000 | 16,500 |
| Sales office (1% of sales) | 6,000 | 6,750 | 7,500 | 8,250 |
| General expenses (1% of sales) | 6,000 | 6,750 | 7,500 | 8,250 |
| ***Total (B)*** | ***72,000*** | ***81,000*** | ***90,000*** | ***99,000*** |
| ***(C) Distribution Cost:*** | | | | |
| Wages (fixed) | 15,000 | 15,000 | 15,000 | 15,000 |
| Rent (1% of sales) | 6,000 | 6,750 | 7,500 | 8,250 |
| Other expenses (4% of sales) | 24,000 | 27,000 | 30,000 | 33,000 |
| ***Total (C)*** | ***45,000*** | ***48,750*** | ***52,500*** | ***56,250*** |
| ***Total Cost (A + B + C)*** | ***2,35,250*** | ***2,49,500*** | ***2,63,750*** | ***2,78,000*** |

***Note:*** In the absence of information it has been assumed that office salaries, depreciation, rates and taxes and wages remain the same at 110% level of activity also. However, in practice some of these costs may change if present capacity is exceeded.

### *BQ 4*

The budgeted expenses for production of 10,000 units in a factory are furnished below:

| ***Particulars*** | ***₹per unit*** |
|---|---|
| Material | 70 |
| Labour | 25 |
| Variable overheads | 20 |
| Fixed overheads (₹1,00,000) | 10 |
| Variable expenses (direct) | 5 |
| Selling expenses (10% fixed) | 13 |
| Distribution expenses (20% fixed) | 7 |
| Administration expenses (₹50,000) | 5 |
| ***Total*** | ***155*** |

***Prepare a budget for the production of (a) 8,000 units, and (b) 6,000 units. Assume that administration expenses are rigid for all levels of production.***

### *Answer*

***Flexible Budget***

| ***Particulars*** | ***6,000 units*** | | ***8,000 units*** | | ***10,000 units*** | |
|---|---|---|---|---|---|---|
| | ***Per unit*** | ***Total*** | ***Per unit*** | ***Total*** | ***Per unit*** | ***Total*** |
| Materials | 70.00 | 4,20,000 | 70.00 | 5,60,000 | 70.00 | 7,00,000 |
| Labour | 25.00 | 1,50,000 | 25.00 | 2,00,000 | 25.00 | 2,50,000 |
| Direct expenses (variable) | 5.00 | 30,000 | 5.00 | 40,000 | 5.00 | 50,000 |
| Variable overhead | 20.00 | 1,20,000 | 20.00 | 1,60,000 | 20.00 | 2,00,000 |
| Fixed overhead | 16.67 | 1,00,000 | 12.50 | 1,00,000 | 10.00 | 1,00,000 |
| Selling expenses: | | | | | | |
| Fixed | 2.17 | 13,000 | 1.63 | 13,000 | 1.30 | 13,000 |
| Variable | 11.70 | 70,200 | 11.70 | 93,600 | 11.70 | 1,17,000 |
| Distribution expenses: | | | | | | |
| Fixed | 2.33 | 14,000 | 1.75 | 14,000 | 1.40 | 14,000 |
| Variable | 5.60 | 33,600 | 5.60 | 44,800 | 5.60 | 56,000 |
| Administration expenses | 8.33 | 50,000 | 6.25 | 50,000 | 5.00 | 50,000 |
| ***Total Cost*** | ***166.80*** | ***10,00,800*** | ***159.43*** | ***12,75,400*** | ***155.00*** | ***15,50,000*** |

### *BQ 5*

M/s NNGS Ltd, specialized in manufacturing of piston rings for motor vehicle. It has prepared budget for 8,000 units per annum at budgeted cost of ₹21,64,400 as detailed below:

| | | |
|---|---|---|
| Fixed cost (Manufacturing) | | ₹2,28,000 |
| Variable cost: | | |
| Power | ₹18,000 | |
| Repairs, etc. | ₹16,000 | |
| Other variable cost | ₹6,400 | |
| Direct materials | ₹6,16,000 | |
| Direct labour | ₹12,80,000 | ₹19,36,400 |
| Total manufacturing cost | | ***₹21,64,400*** |

Considering the possible impact on sales turnover by market trends, the company decides to prepare flexible budget with a production of 4,000 and 6,000 units. On behalf of the company you are required to prepare flexible budget for production level at 50% and 75%.

Assuming the selling price per unit is maintained at ₹400 as at present, indicate the effect on net profit. Administration, selling and distribution overheads continue at ₹72,000.

**Answer**

**Flexible Budget**

| Particulars | 4,000 units | 6,000 units | 8,000 units |
|---|---|---|---|
| **Sales @ ₹400 per unit** | **16,00,000** | **24,00,000** | **32,00,000** |
| **(A) Variable Cost:** | | | |
| Direct Materials | 3,08,000 | 4,62,000 | 6,16,000 |
| Direct Labour | 6,40,000 | 9,60,000 | 12,80,000 |
| Power | 9,000 | 13,500 | 18,000 |
| Repairs | 8,000 | 12,000 | 16,000 |
| Other variable cost | 3,200 | 4,8000 | 6,400 |
| **Total (A)** | **9,68,200** | **14,52,300** | **19,36,400** |
| **(B) Fixed Cost:** | | | |
| Manufacturing | 2,28,000 | 2,28,000 | 2,28,000 |
| Administration, Selling and Distribution | 72,000 | 72,000 | 72,000 |
| **Total (B)** | **3,00,000** | **3,00,000** | **3,00,000** |
| **Total Cost (A + B)** | **12,68,200** | **17,52,300** | **22,36,400** |
| **Net Profit (Sales – Total Cost)** | **3,31,800** | **6,47,700** | **9,63,600** |

**BQ 6**

S Ltd. has prepared budget for the coming year for its two products A and B.

| | Product A | Product B |
|---|---|---|
| Production & Sales units | 6,000 | 9,000 |
| Raw material cost per unit | ₹60.00 | ₹42.00 |
| Direct labour cost per unit | ₹30.00 | ₹18.00 |
| Variable overhead per unit | ₹12.00 | ₹6.00 |
| Fixed overhead per unit | ₹8.00 | ₹4.00 |
| Selling price per unit | ₹120.00 | ₹78.00 |

After some marketing efforts, the sales quantity of the Product A & B can be increased by 1,500 units and 500 units respectively but for this purpose the variable overhead and fixed overhead will be increased by 10% and 5% respectively for both products.

**You are required to prepare flexible budget for both the products:**

**(a)** Before marketing efforts.

**(b)** After marketing efforts.

**Answer**

**(a) Flexible Budget before Marketing Efforts**

| Particulars | Product A (6,000 units) | | Product B (9,000 units) | |
|---|---|---|---|---|
| | Per unit | Total | Per unit | Total |
| Sales | 120.00 | 7,20,000 | 78.00 | 7,02,000 |
| Raw materials cost | 60.00 | 3,60,000 | 42.00 | 3,78,000 |
| Direct labour cost | 30.00 | 1,80,000 | 18.00 | 1,62,000 |
| Variable overhead | 12.00 | 72,000 | 6.00 | 54,000 |
| Fixed overhead | 8.00 | 48,000 | 4.00 | 36,000 |
| **Total cost** | **110.00** | **6,60,000** | **70.00** | **6,30,000** |
| **Profit** | **10.00** | **60,000** | **8.00** | **72,000** |

**(b) Flexible Budget After Marketing Efforts**

| Particulars | Product A (7,500 units) | | Product B (9,500 units) | |
|---|---|---|---|---|
| | Per unit | Total | Per unit | Total |
| Sales | 120.00 | 9,00,000 | 78.00 | 7,41,000 |
| Raw materials cost | 60.00 | 4,50,000 | 42.00 | 3,99,000 |
| Direct labour cost | 30.00 | 2,25,000 | 18.00 | 1,71,000 |
| Variable overhead | 13.20 | 99,000 | 6.60 | 62,700 |
| Fixed overhead (48,000 + 5%)/(36,000 + 5%) | 6.72 | 50,400 | 3.98 | 37,800 |
| **Total cost** | **109.92** | **8,24,400** | **70.58** | **6,70,500** |
| **Profit** | **10.08** | **75,600** | **7.42** | **70,500** |

**BQ 7**

During the FY 2022-23, P Limited has produced 60,000 units operating at 50% capacity level. The cost structure at the 50% level of activity is as under:

| | |
|---|---|
| Direct Material | ₹300 per unit |
| Direct Wages | ₹100 per unit |
| Variable Overheads | ₹100 per unit |
| Direct Expenses | ₹60 per unit |
| Factory Expenses (25% Fixed) | ₹80 per unit |
| Selling and Distribution Expenses (80% Variable) | ₹40 per unit |
| Office and Administrative Expenses (100% Fixed) | ₹20 per unit |

The company anticipates that in FY 2023-24, the variable costs will go up by 20% and fixed costs will go up by 15%. The selling price per unit will increase by 10% to ₹880

**Required:**

**(a)** Calculate the budgeted profit/loss for the FY 2022-23.

**(b)** Prepare an Expense budget on marginal cost basis for the FY 2023-24 for the company at 50% and 60% level of activity and find out the profits at respective levels.

**Answer**

**(1) Statement of Budgeted Profit for the FY 2022-23**

| Particulars | Per Unit (₹) | 60,000 units (₹) |
|---|---|---|
| **(A) Sales** | 800.00 | 4,80,00,000 |
| **(B) Variable Cost:** | | |
| Direct Material | 300 | 1,80,00,000 |
| Direct Wages | 100 | 60,00,000 |
| Variable Overhead | 100 | 60,00,000 |
| Direct Expenses | 60 | 36,00,000 |
| Variable Factory Expenses (75% of ₹80 p.u.) | 60 | 36,00,000 |
| Variable Selling and Distribution Expenses (80% of ₹40 p.u.) | 32 | 19,20,000 |
| **Total (B)** | **652** | **3,91,20,000** |
| **(C) Contribution (A - B)** | **148** | **88,80,000** |
| **(D) Fixed Cost:** | | |
| Office and Administration Expenses (100%) | - | 12,00,000 |
| Fixed Factory Expenses (25%) | - | 12,00,000 |
| Fixed Selling and Distribution Expenses (20%) | - | 4,80,000 |
| **Total (D)** | | **28,80,000** |
| **Net Profit (C - D)** | **-** | **60,00,000** |

**(2) Expense Budget of P Ltd. for the FY 2023-24 at 50% & 60% level**

| Particulars | 60,000 units | | 72,000 units | |
|---|---|---|---|---|
| | Per Unit | Amount | Per Unit | Amount |
| **(A) Sales** | 880 | 5,28,00,000 | 880 | 6,33,60,000 |
| **(B) Variable Cost:** | | | | |
| Direct Material | 360 | 2,16,00,000 | 360 | 2,59,20,000 |
| Direct Wages | 120 | 72,00,000 | 120 | 86,40,000 |
| Variable Overhead | 120 | 72,00,000 | 120 | 86,40,000 |
| Direct Expenses | 72 | 43,20,000 | 72 | 51,84,000 |
| Variable Factory Expenses | 72 | 43,20,000 | 72 | 51,84,000 |
| Variable Selling and Distribution Expenses | 38.40 | 23,04,000 | 38.40 | 27,64,800 |
| **Total (B)** | **782.40** | **4,69,44,000** | **782.40** | **5,63,32,800** |
| **(C) Contribution (A - B)** | **97.60** | **58,56,000** | **97.60** | **70,27,200** |
| **(D) Fixed Cost:** | | | | |
| Office and Administration Expenses (100%) | - | 13,80,000 | - | 13,80,000 |
| Fixed Factory Expenses (25%) | - | 13,80,000 | - | 13,80,000 |
| Fixed Selling and Distribution Expenses (20%) | - | 5,52,000 | - | 5,52,000 |
| **Total (D)** | | **33,12,000** | | **33,12,000** |
| **Net Profit (C - D)** | **-** | **25,44,000** | **-** | **37,15,200** |

### *BQ 8*

ABC Ltd. is currently operating at 75% of its capacity. In the past two years the level of operations was 55% and 65% respectively. Presently, the production is 75,000 units. The company is planning for 85% capacity level during 2022-23. The cost details are as follow:

| *Particulars* | *55%* | *65%* | *75%* |
|---|---|---|---|
| Direct materials | 11,00,000 | 13,00,000 | 15,00,000 |
| Direct Labour | 5,50,000 | 6,50,000 | 7,50,000 |
| Factory Overheads | 3,10,000 | 3,30,000 | 3,50,000 |
| Selling overheads | 3,20,000 | 3,60,000 | 4,00,000 |
| Administrative Overheads | 1,60,000 | 1,60,000 | 1,60,000 |
| ***Total cost*** | ***24,40,000*** | ***28,00,000*** | ***31,60,000*** |

Profit is estimated @ 20% on sales.

***The following increases in costs are expected during the year:***

| | |
|---|---|
| Direct materials | 8% |
| Direct Labour | 5% |
| Variable factory overheads | 5% |
| Variable selling overheads | 8% |
| Fixed factory overheads | 10% |
| Fixed selling overheads | 15% |
| Administrative overheads | 10% |

***Prepare a flexible budget for the period 2022-23 at 85% level of capacity and ascertain the profit and contribution.***

***[Profit ₹9,46,300; Contribution ₹14,57,300; Sales ₹47,31,500]***

### *BQ 9*

The Budget manager of Jaypee Electricals Ltd. is preparing a flexible budget for the accounting year commencing from 1st April. Normal capacity of production of the company is 1,25,000 units.

The company produces one product, a component 'P'. Direct material costs ₹7 per unit. Direct labour averages ₹2.50 per hour and requires 1.60 hours to produce on unit of 'P'. Salesmen are paid a commission of ₹1 per unit sold.

Fixed selling and administration expenses amount to ₹85,000 per year. Manufacturing overhead has been estimated in the following amounts under specified conditions of volume:

| *Particulars* | *1,20,000 units* | *1,50,000 units* |
|---|---|---|
| Indirect materials | 2,64,000 | 3,30,000 |
| Indirect Labour | 1,50,000 | 1,87,500 |
| Inspection | 90,000 | 1,12,500 |
| Maintenance | 84,000 | 1,02,000 |
| Supervision | 1,98,000 | 2,34,000 |
| Depreciation (Plant &Equipment) | 90,000 | 90,000 |
| Engineering services | 94,000 | 94,000 |
| ***Total Manufacturing Overhead*** | ***9,70,000*** | ***11,50,000*** |

***Prepare a budget of total cost at 1,40,000 units of output.***

### *Answer*

***Flexible Budget***

| *Particulars* | | | *Amount (₹)* |
|---|---|---|---|
| ***(A)*** | ***Variable Cost:*** | | |
| | Direct materials | (1,40,000 × ₹7) | 9,80,000 |
| | Direct labour | (1,40,000 × 1.6 hours × ₹2.5) | 5,60,000 |
| | Salesmen commission | (1,40,000 × ₹1) | 1,40,000 |

| | | | |
|---|---|---|---|
| | Indirect materials | {(₹2,64,000 ÷ 1,20,000) × 1,40,000} | 3,08,000 |
| | Indirect Labour | {(₹1,50,000 ÷ 1,20,000) × 1,40,000} | 1,75,000 |
| | Inspection | {(₹90,000 ÷ 1,20,000) × 1,40,000} | 1,05,000 |
| | ***Total (A)*** | | ***22,68,000*** |
| ***(B)*** | ***Fixed Cost:*** | | |
| | Selling and administration | | 85,000 |
| | Depreciation | | 90,000 |
| | Engineering services | | 94,000 |
| | ***Total (B)*** | | ***2,69,000*** |
| ***(C)*** | ***Semi Variable Cost:*** | | |
| | Maintenance: | | |
| | Variable | (1,40,000 × ₹0.60) | 84,000 |
| | Fixed | | 12,000 |
| | Supervision: | | |
| | Variable | (1,40,000 × ₹1.20) | 1,68,000 |
| | Fixed | | 54,000 |
| | ***Total (C)*** | | ***3,18,000*** |
| | ***Total Cost (A + B + C)*** | | ***28,55,000*** |

***Working Note:***

***Calculation of variable cost per unit and fixed cost portion of semi variable items:***

***Variable cost per unit*** = $\frac{\text{Difference in Total Cost}}{\text{Difference in Units}}$

Variable Maintenance cost per unit = $\frac{1,02,000 - 84,000}{1,50,000 - 1,20,000}$ = ₹0.60 per unit

Variable Supervision cost per unit = $\frac{2,34,000 - 1,98,000}{1,50,000 - 1,20,000}$ = ₹1.20 per unit

***Fixed cost*** = Total cost – Variable Cost

Fixed Maintenance cost = 84,000 – 1,20,000 × 0.60 = ₹12,000

Fixed Supervision cost = 1,98,000 – 1,20,000 × 1.20 = ₹54,000

### *BQ 10*

Action Plan Manufacturers normally produce 8,000 units of their product in a month, in their machine shop. For the month of January, they had planned for a production of 10,000 units. Owing to a sudden cancellation of a contract in the middle of January, they could only produce 6,000 units in January.

Indirect manufacturing costs are carefully planned and monitored in the machine shop and the foreman of the shop is paid a 10% of the savings as bonus when in any month the indirect manufacturing cost incurred is less than the budgeted provision.

The foreman has put in a claim that he should be paid a bonus of ₹88.50 for the month of January. The works manager wonders how anyone can claim a bonus when the Company has lost a sizeable contract. The relevant figures are as under:

| *Indirect manufacturing costs* | *For a normal month 8,000 units* | *Planned for January 10,000 units* | *Actual in January 6,000 units* |
|---|---|---|---|
| Salary of foreman | 1,000.00 | 1,000.00 | 1,000.00 |
| Indirect Labour | 720.00 | 900.00 | 600.00 |
| Indirect material | 800.00 | 1,000.00 | 700.00 |
| Repairs and maintenance | 600.00 | 650.00 | 600.00 |
| Power | 800.00 | 875.00 | 740.00 |
| Tools consumed | 320.00 | 400.00 | 300.00 |
| Rates and taxes | 150.00 | 150.00 | 150.00 |
| Depreciation | 800.00 | 800.00 | 800.00 |
| Insurance | 100.00 | 100.00 | 100.00 |
| ***Total*** | ***5,290.00*** | ***5,875.00*** | ***4,990.00*** |

***Do you agree with the works manager? Is the foreman entitled to any bonus for the performance in January? Substantiate your answer with facts and figures.***

***[Costs as per flexible budget for 6,000 units are ₹4,705; hence, foreman is not entitled for Bonus.]***

## *PRODUCTION AND RELATED BUDGETS*

### *BQ 11*

A single product company estimated its sales for the next year quarter-wise as under:

| *Quarter* | *Sales (in units)* |
|---|---|
| I | 30,000 |
| II | 37,500 |
| III | 41,250 |
| IV | 45,000 |

The opening stock of finished goods is 6,000 units and the company expects to maintain the closing stock of finished goods at 12,250 units at the end of the year. The production pattern in each quarter is based on 80% of the sales of the current quarter and 20% of the sales of the next quarter.

The opening stock of raw materials in the beginning of the year is 10,000 kg and the closing stock at the end of the year is required to be maintained at 5,000 kg. Each unit of finished output requires 2 kg of raw materials. The value of the opening stock of raw materials in the beginning of the year is ₹20,000.

The company proposes to purchase the entire annual requirement of raw materials in the first three quarters in the proportion and at the prices given below:

| *Quarter* | *Purchase of raw materials (%)* | *Price per kg* |
|---|---|---|
| I | 30% | ₹2 |
| II | 50% | ₹3 |
| III | 20% | ₹4 |

***You are required to present the following for the next year, quarter wise:***

***(i)*** Production budget in units.
***(ii)*** Raw material consumption budget in quantity.
***(iii)*** Raw material purchase budget in quantity and value.
***(iv)*** Prepare stores ledger on the basis of FIFO method.

***[(i) 31,500, 38,250, 42,000, 48,250 (ii) 63,000, 76,500, 84,000, 96,500 (iii) 94,500, 1,57,500, 63,000 and 1,89,000, 4,72,500, 2,52,000]***

### *BQ 12*

Jigyasa Ltd. is drawing a production plan for its two products Minimax (MM) and Heavyhigh (HH) for the year 2023-24. The company's policy is to hold closing stock of finished goods at 25% of the anticipated volume of sales of the succeeding month. The following are the estimated data for two products:

| | *Minimax (MM)* | *Heavyhigh (HH)* |
|---|---|---|
| Budgeted production (in units) | 1,80,000 | 1,20,000 |
| Direct material per unit | ₹220.00 | ₹280.00 |
| Direct labour per unit | ₹130.00 | ₹120.00 |
| Manufacturing overheads | ₹4,00,000 | ₹5,00,000 |

***The estimated units to be sold in the first four months of the year 2023-24 are as under:***

| | *April* | *May* | *June* | *July* |
|---|---|---|---|---|
| ***Minimax (MM)*** | 8,000 | 10,000 | 12,000 | 16,000 |
| ***Heavyhigh (HH)*** | 6,000 | 8,000 | 9,000 | 14,000 |

***You are required to:***

***(a)*** Prepare a production budget for the first quarter in month-wise.
***(b)*** Present production cost budget for first quarter.

**Answer**

**(a) Production Budget of Product Minimax and Heavyhigh (in units)**

| Particulars | April | | May | | June | | Total | |
|---|---|---|---|---|---|---|---|---|
| | MM | HH | MM | HH | MM | HH | MM | HH |
| Sales | 8,000 | 6,000 | 10,000 | 8,000 | 12,000 | 9,000 | 30,000 | 23,000 |
| Add: Closing Stock (25% of next month's sales) | 2,500 | 2,000 | 3,000 | 2,250 | 4,000 | 3,500 | 9,500 | 7,750 |
| Less: Opening Stock | *2,000 | *1,500 | 2,500 | 2,000 | 3,000 | 2,250 | 7,500 | 5,750 |
| **Production in units** | **8,500** | **6,500** | **10,500** | **8,250** | **13,000** | **10,250** | **32,000** | **25,000** |

**Note:** Opening stock of April is the closing stock of March, which is as per company's policy 25% of next month's sales.

**(b) Production Cost Budget**

| Elements of cost | Minimax (MM) | | Heavyhigh (HH) | |
|---|---|---|---|---|
| | Per unit | Total (₹) | Per unit | Total (₹) |
| No of units | 1 | 32,000 | 1 | 25,000 |
| Direct Material | 220 | 70,40,000 | 280 | 70,00,000 |
| Direct Labour | 130 | 41,60,000 | 120 | 30,00,000 |
| Manufacturing Overhead: | | | | |
| MM: (₹4,00,000 ÷ 1,80,000) × 32,000 | 2.22 | 71,111 | - | - |
| HH: (₹5,00,000 ÷ 1,20,000) × 25,000 | - | - | 4.167 | 1,04,167 |
| **Production Cost** | **352.22** | **1,12,71,111** | **404.167** | **1,01,04,167** |

## BQ 13

K Ltd. produces and markets a very popular product called 'X'. The company is interested in presenting its budget for the second quarter of 2023.

***The following information are made available for this purpose:***

***(a)*** It expects to sell 1,50,000 bags of 'X' during the second quarter of 2023 at the selling price of ₹1,200 per bag.

***(b)*** Each bag of 'X' requires 2.5 mtr. of raw material 'Y' and 7.5 mtr. of raw – material 'Z'.

***(c)*** Stock levels are planned as follows:

| Particulars | Beginning of Quarter | End of Quarter |
|---|---|---|
| Finished Bags of 'X' (Nos.) | 45,000 | 33,000 |
| Raw – Material 'Y' (mtr) | 96,000 | 78,000 |
| Raw – Material 'Z' (mtr) | 1,71,000 | 1,41,000 |
| Empty Bag (Nos.) | 1,11,000 | 84,000 |

***(d)*** 'Y' cost ₹160 per mtr., 'Z' costs ₹30 per mtr. and 'Empty Bag' costs ₹110 each.

***(e)*** It requires 9 minutes of direct labour to produce and fill one bag of 'X'. Labour cost is ₹70 per hour.

***(f)*** Variable manufacturing costs are ₹60 per bag. Fixed manufacturing costs ₹40,00,000 per quarter.

***(g)*** Variable selling and administration expenses are 5% of sales and fixed administration and selling expenses are ₹3,75,000 per quarter.

***Required***

**1.** Prepare a production budget for the said quarter in quantity.
**2.** Prepare a raw material purchase budget for 'Y', 'Z' and 'Empty Bags' for the said quarter in quantity as well as in rupees.
**3.** Compute the budgeted variable cost to produce one bag of 'X'.

***Answer***

### 1. Production Budget of 'X' for the Second Quarter

| Particulars | Bags (Nos.) |
|---|---|
| Budgeted Sales | 1,50,000 |
| Add: Desired Closing stock | 33,000 |
| Total Requirements | 1,83,000 |
| Less: Opening stock | (45,000) |
| Required Production | 1,38,000 |

### 2. Raw Materials Purchase Budget in Quantity as well as in ₹ for 1,38,000 Bags of 'X'

| Particulars | 'Y' | 'Z' | Empty Bags |
|---|---|---|---|
| Production Requirements Per bag of 'X' | 2.5 | 7.5 | 1.0 |
| Requirement for Production | 3,45,000<br>(1,38,000 × 2.5) | 10,35,000<br>(1,38,000 × 7.5) | 1,38,000<br>(1,38,000 × 1) |
| Add: Desired Closing Stock | 78,000 | 1,41,000 | 84,000 |
| Total Requirements | 4,23,000 | 11,76,000 | 2,22,000 |
| Less: Opening Stock | (96,000) | (1,71,000) | (1,11,000) |
| ***Quantity to be Purchased*** | ***3,27,000*** | ***10,05,000*** | ***1,11,000*** |
| Cost per mtr./Bag | ₹160 | ₹30 | ₹110 |
| ***Cost of Purchase*** | ***₹5,23,20,000*** | ***₹3,01,50,000*** | ***₹1,22,10,000*** |

### 3. Computation of Budgeted Variable Cost of Production of 1 Bag of 'X'

| Particulars | Amount (₹) |
|---|---|
| Raw Material: | |
| Y 2.5 mtr @₹160 | 400.00 |
| Z 7.5 mtr @₹30 | 225.00 |
| Empty Bag | 110.00 |
| Direct Labour {(₹70 ÷ 60 minutes) × 9 minutes} | 10.50 |
| Variable Manufacturing Overheads | 60.00 |
| ***Variable Cost of Production per bag*** | 805.50 |

## BQ 14

RS Ltd manufactures and sells a single product and has estimated sales revenue of ₹302.4 lakh during the year based on 20% profit on selling price. Each unit of product requires 6 kg of material A and 3 kg of material B and processing time of 4 hours in machine shop and 2 hours in assembly shop. Factory overheads are absorbed at a blanket rate of 20% of direct labour. Variable selling & distribution overheads are ₹60 per unit sold and fixed selling & distribution overheads are estimated to be ₹69,12,000.

***The other relevant details are as under:***

| | | |
|---|---|---|
| Purchase price | Material A | ₹160 per kg |
| | Material B | ₹100 per kg |
| Labour rate | Machine shop | ₹140 per hour |
| | Assembly shop | ₹70 per hour |

| | Finished Stock | Material A | Material B |
|---|---|---|---|
| Opening Stock | 2,500 units | 7,500 kg | 4,000 kg |
| Closing Stock | 3,000 units | 8,000 kg | 5,500 kg |

***Required:***

***(1)*** Calculate number of units of product proposed to be sold and selling price per unit,
***(2)*** Prepare production budget in units, and
***(3)*** Prepare Material purchase budget in units.

### Answer

***(1) Calculation of number of units of product to be sold and selling price per unit:***

| | | | | |
|---|---|---|---|---|
| ***Number of units sold*** | = | Total Variable Cost ÷ Variable Cost Per Unit | | |
| | = | ₹1,72,80,000 ÷ ₹2,160 | = | ***8,000 units*** |
| ***Selling Price per unit*** | = | Total Sales Value ÷ Number of units sold | | |
| | = | ₹3,02,40,000 ÷ 8,000 units | = | ***₹3,780*** |

***(2) Production Budget (units)***

| *Particulars* | *units* |
|---|---|
| Budgeted Sales<br>Add: Closing Stock<br>Less: Opening Stock | 8,000<br>3,000<br>(2,500) |
| ***Production (units)*** | ***8,500*** |

***(3) Material Purchase Budget (units)***

| *Particulars* | *Material A* | *Material B* |
|---|---|---|
| Raw Material Consumption (8,500 units × 6kg/3kg)<br>Add: Closing Stock<br>Less: Opening Stock | 51,000<br>8,000<br>(7,500) | 25,500<br>5,500<br>(4,000) |
| ***Raw Material to be Purchased (units)*** | ***51,500*** | ***27,000*** |

***Working Notes:***

| | | | | |
|---|---|---|---|---|
| ***(a)*** Total Variable Cost | = | Total Sales – Desired Profit – Fixed Cost | | |
| | = | ₹3,02,40,000 – 20% of Sales – ₹69,12,000 | = | ***₹1,72,80,000*** |

### BQ 15

A light motor vehicle manufacturer has prepared sales budget for the next few months, and the following draft figures are available:

| *Month* | *Number of vehicles* |
|---|---|
| October | 4,000 |
| November | 3,500 |
| December | 4,500 |
| January | 6,000 |
| February | 6,500 |

To manufacture a vehicle a standard cost of ₹2,85,700 is incurred and sold through dealers at a uniform selling price of ₹3,95,600 to customers. Dealers are paid 12.5% commission on selling price on sale of a vehicle.

Apart from other materials four units of Part X are required to manufacture a vehicle. It is a policy of the company to hold stocks of Part X at the end of the each month to cover 40% of next month's production. 4,800 units of Part X are in stock as on 1st October.

There are 950 numbers of completed vehicles in stock as on 1st October and it is the policy to have stock at the end of each month to cover 20% of the next month's sales.

***You are required to:***

***(a)*** Prepare Production budget (in numbers) for the month of October, November, December and January.
***(b)*** Prepare Purchase budget for Part X (in units) for the month of October, November and December.
***(c)*** Calculate the budgeted Gross profit for the quarter October to December.

### Answer

***(a) Production Budget (in numbers)***

| *Particulars* | *October* | *November* | *December* | *January* |
|---|---|---|---|---|
| Demand for the month (in nos.)<br>Add: Closing Stock<br>(20% of the next month's demand)<br>Less: Opening Stock | 4,000<br>700<br><br>(950) | 3,500<br>900<br><br>(700) | 4,500<br>1,200<br><br>(900) | 6,000<br>1,300<br><br>(1,200) |
| ***Vehicles to be produced*** | ***3,750*** | ***3,700*** | ***4,800*** | ***6,100*** |

### (b) Purchase Budget for Part X (in units)

| Particulars | October | November | December |
|---|---|---|---|
| Production for the month (in numbers) | 3,750 | 3,700 | 4,800 |
| No of units of Part X required for production of current month (4 units for 1 units of vehicle) | 15,000 | 14,800 | 19,200 |
| Add: Closing Stock of Part X<br>(To cover 40% of the next month's production) | 5,920<br>(40% × 14,800) | 7,680<br>(40% × 19,200) | 9,760<br>(40%×4×6,100) |
| Less: Opening Stock | (4,800) | (5,920) | (7,680) |
| ***Part X to be purchased*** | ***16,120*** | ***16,560*** | ***21,280*** |

### (c) Budgeted Gross Profit for the Quarter October to December

| Particulars | October | November | December | Total |
|---|---|---|---|---|
| Sales in numbers | 4,000 | 3,500 | 4,500 | 12,000 |
| Sales value @ ₹3,46,150 per unit (in Lakh) | 13,846 | 12,115.25 | 15,576.75 | 41,538 |
| Less: Cost @ ₹2,85,700 per unit (in Lakh) | 11,428 | 9,999.50 | 12,856.50 | 34,284 |
| ***Gross Profit (in Lakh)*** | ***2,418*** | ***2,115.75*** | ***2,720.25*** | ***7,254*** |

***Note:*** Net selling price per unit (₹3,95,600 – 12.5% commission = ₹3,46,150) is used to prepare the gross profit budget.

## SALES BUDGET

### BQ 16

B Ltd manufactures two products viz., X and Y and sells them through two divisions, East and West. For the purpose of Sales Budget to the Budget Committee, following information has been made available for the year 2022-23:

| Product | Budgeted Sales | | Actual Sales | |
|---|---|---|---|---|
| | East Division | West Division | East Division | West Division |
| ***X*** | 800 units at ₹18 | 1,200 units at ₹18 | 1,000 units at ₹18 | 1,400 units at ₹18 |
| ***Y*** | 600 units at ₹42 | 1,000 units at ₹42 | 400 units at ₹42 | 800 units at ₹42 |

Adequate market studies reveal that product X is popular but underpriced. It is expected that if the price of X is increased by ₹2, it will find a ready market. On the other hand, Y is overpriced and if the price of Y is reduced by ₹2, it will have more demand in the market. The company management has agreed for the aforesaid price changes. On the basis of these price changes and the reports of salesmen, following estimates have been prepared by the Divisional Managers:

***Percentage increase in sales over budgeted sales:***

| Product | East Division | West Division |
|---|---|---|
| ***X*** | + 12.5% | + 7.5% |
| ***Y*** | + 22.5% | + 12.5% |

With the help of the intensive advertisement campaign, following additional sales (over and above the above mentioned estimated sales by Divisional Managers) are possible:

| Product | East Division | West Division |
|---|---|---|
| ***X*** | 120 units | 140 units |
| ***Y*** | 80 units | 100 units |

***You are required to prepare Sales Budget 2023 – 2024 after incorporating above estimates and also show the Budgeted Sales and Actual Sales of 2022 – 2023.***

***Answer***

### 1. Statement Showing Sales Budget for 2023-24

| Division | Product X | | | Product Y | | | Total |
|---|---|---|---|---|---|---|---|
| | Qty. | Rate (₹) | Amount (₹) | Qty. | Rate (₹) | Amount (₹) | Amount (₹) |
| East | 1,020 | 20 | 20,400 | 815 | 40 | 32,600 | 53,000 |
| West | 1,430 | 20 | 28,600 | 1,225 | 40 | 49,000 | 77,600 |
| ***Total*** | ***2,450*** | - | ***49,000*** | ***2,040*** | - | ***81,600*** | ***1,30,600*** |

***Working notes:***

***Calculation of budgeted sales of product X for 2023 -24 in units:***

| | | | | |
|---|---|---|---|---|
| East division | = | (800 units + 12.5%) + 120 units | = | 1,020 units |
| West division | = | (1,200 units + 7.5%) + 140 units | = | 1,430 units |

***Calculation of budgeted sales of product Y for 2022 -23 in units:***

| | | | | |
|---|---|---|---|---|
| East division | = | (600 units + 22.5%) + 80 units | = | 815 units |
| West division | = | (1,000 units + 12.5%) + 100 units | = | 1,225 units |

### Statement Showing Sales Budget for 2022 – 23

| Division | Product X | | | Product Y | | | Total |
|---|---|---|---|---|---|---|---|
| | Qty. | Rate (₹) | Amount (₹) | Qty. | Rate (₹) | Amount (₹) | Amount (₹) |
| East | 800 | 18 | 14,400 | 600 | 42 | 25,200 | 39,600 |
| West | 1,200 | 18 | 21,600 | 1,000 | 42 | 42,000 | 63,600 |
| ***Total*** | ***2,000*** | - | ***36,000*** | ***1,600*** | - | ***67,200*** | ***1,03,200*** |

### Statement Showing Actual Sales for 2022 – 23

| Division | Product X | | | Product Y | | | Total |
|---|---|---|---|---|---|---|---|
| | Qty. | Rate (₹) | Amount (₹) | Qty. | Rate (₹) | Amount (₹) | Amount (₹) |
| East | 1,000 | 18 | 18,000 | 400 | 42 | 16,800 | 34,800 |
| West | 1,400 | 18 | 25,200 | 800 | 42 | 33,600 | 58,800 |
| ***Total*** | ***2,400*** | - | ***43,200*** | ***1,200*** | - | ***50,400*** | ***93,600*** |

## MASTER BUDGET

### BQ 17

Float Glass manufacturing company requires you to present the Master budget for the next year from the following information:

***Sales:***

| | |
|---|---|
| Toughened Glass | ₹6,00,000 |
| Bent Glass | ₹2,00,000 |

***Cost:***

| | |
|---|---|
| Direct materials cost | 60% of sales |
| Direct wages | 20 workers @ ₹150 per month |
| Factory overheads: | |
| Indirect labour: | |
| Works manager | ₹500 per month |
| Foreman | ₹400 per month |
| Stores and spares | 2.5% of sales |
| Depreciation on machine | ₹12,600 |
| Light and power | ₹3,000 |
| Repairs and maintenance | ₹8,000 |
| Other sundries | 10% of direct wages |
| Administration, selling and distribution expenses | ₹36,000 per year |

## Answer

**Master Budget**

| Particulars | ₹ | ₹ | ₹ |
|---|---|---|---|
| Sales: | | | |
| Toughened Glass | | | 6,00,000 |
| Bent Glass | | | 2,00,000 |
| **Total Sales** | | | **8,00,000** |
| ***Less:*** Cost of production: | | | |
| Direct materials (60% of ₹8,00,000) | | 4,80,000 | |
| Direct wages (20 workers × ₹150 × 12 months) | | 36,000 | |
| **Prime Cost** | | **5,16,000** | |
| Fixed Factory Overheads: | | | |
| Works manager's salary (₹500 × 12 months) | 6,000 | | |
| Foreman's salary (₹400 × 12 months) | 4,800 | | |
| Depreciation | 12,600 | | |
| Light and power (assumed fixed) | 3,000 | 26,400 | |
| Variable Factory Overheads: | | | |
| Stores and spares (2.5% of ₹8,00,000) | 20,000 | | |
| Repairs and maintenance (assumed variable) | 8,000 | | |
| Sundry expenses (10% of ₹36,000) | 3,600 | 31,600 | |
| **Works Cost** | | | **5,74,000** |
| **Gross Profit (Sales – Works cost)** | | | **2,26,000** |
| ***Less:*** Administration, selling and distribution OH | | | 36,000 |
| **Net Profit** | | | **1,90,000** |

## BQ 18

'Mirror Look', a high gloss wooden manufacturing company, requires you to prepare the Master budget for the next year from the following information:

**Sales:**

| | |
|---|---|
| Acrylic finish wooden sheets | ₹70,00,000 |
| Lacquer finish wooden sheets | ₹30,00,000 |

**Cost:**

| | |
|---|---|
| Direct materials cost | 65% of sales |
| Direct wages | 25 workers @ ₹1,500 per month |
| Factory overheads: | |
| Indirect labour: | |
| Works manager | ₹5,500 per month |
| Foreman | ₹4,500 per month |
| Stores and spares | 2.5% of sales |
| Depreciation on machine | ₹1,26,000 |
| Light and power (fixed) | ₹30,000 |
| Repairs and maintenance | ₹80,000 |
| Other sundries | 10% of direct wages |
| Administration, selling and distribution expenses | ₹3,99,000 per year |

## Answer

**Master Budget**

| Particulars | ₹ | ₹ | ₹ |
|---|---|---|---|
| Sales: | | | |
| Acrylic finish wooden sheets | | | 70,00,000 |
| Lacquer finish wooden sheets | | | 30,00,000 |
| **Total Sales** | | | **1,00,00,000** |
| ***Less:*** Cost of production: | | | |

| | | | |
|---|---|---|---|
| Direct materials (65% of ₹1,00,00,000) | | 65,00,000 | |
| Direct wages (25 workers × ₹1,500 × 12 months) | | 4,50,000 | |
| ***Prime Cost*** | | ***69,50,000*** | |
| Fixed Factory Overheads: | | | |
| Works manager's salary (₹5,500 × 12 months) | 66,000 | | |
| Foreman's salary (₹4,500 × 12 months) | 54,000 | | |
| Depreciation | 1,26,000 | | |
| Light and power (fixed) | 30,000 | 2,76,000 | |
| Variable Factory Overheads: | | | |
| Stores and spares (2.5% of ₹1,00,00,000) | 2,50,000 | | |
| Repairs and maintenance (assumed variable) | 80,000 | | |
| Sundry expenses (10% of ₹4,50,000) | 45,000 | 3,75,000 | |
| ***Works Cost*** | | | ***76,01,000*** |
| ***Gross Profit (Sales – Works cost)*** | | | ***23,99,000*** |
| ***Less:*** Administration, selling and distribution OH | | | 3,99,000 |
| ***Net Profit*** | | | ***20,00,000*** |

## OTHER BUDGETS

***BQ 19***

***The information of Z Ltd. for the year ended 31st March 2023 is as below:***

| | ***Amount (₹)*** |
|---|---|
| Direct materials | 17,50,000 |
| Direct wages | 12,50,000 |
| Variable factory overhead | 9,50,000 |
| Fixed factory overhead | 12,00,000 |
| Other variable costs | 6,00,000 |
| Other fixed costs | 4,00,000 |
| Profit | 8,50,000 |
| Sales | 70,00,000 |

***During the year, the company manufactured two products, X and Y, and the output and cost were:***

| | ***X*** | ***Y*** |
|---|---|---|
| Output (units) | 8,000 | 4,000 |
| Selling price per unit (₹) | 600 | 550 |
| Direct material per unit (₹) | 140 | 157.50 |
| Direct wages per unit (₹) | 90 | 132.50 |
| | | |

Variable factory overheads are absorbed as a percentage of direct wages and other variable costs are computed as Product X – ₹40 per unit and Product Y– ₹70 per unit.

For the FY 2023–24, due to a pandemic, it is expected that demand for product X and Y will fall by 20% & 10% respectively. It is also expected that direct wages cost will raise by 20% and other fixed costs by 10%. Products will be required to be sold at a discount of 20%.

***You are required to:***

***(1)*** Prepare product wise profitability statement on marginal costing method for the FY 2022–23 and
***(2)*** Prepare a budget for the FY 2023-24.

***Answer***

***(1) Product-wise Profitability Statement for the FY 2023-24***

| ***Particulars*** | ***Product X 8,000 units*** | ***Product Y 4,000 units*** | ***Total*** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| ***Sales value @ ₹600/₹550 per unit*** | ***48,00,000*** | ***22,00,000*** | ***70,00,000*** |
| ***Less: Variable Cost:*** | | | |
| Direct Material @ ₹140/₹157.50 per unit | 11,20,000 | 6,30,000 | 17,50,000 |
| Direct wages @ ₹90/₹132.50 per unit | 7,20,000 | 5,30,000 | 12,50,000 |
| Variable factory OH @ 76% of Direct wages | 5,47,200 | 4,02,800 | 9,50,000 |
| Other Variable cost @ ₹40/₹70 per unit | 3,20,000 | 2,80,000 | 6,00,000 |
| ***Contribution*** | ***20,92,800*** | ***3,57,200*** | ***24,50,000*** |
| ***Less: Fixed Cost:*** | | | |
| Fixed factory overhead | - | - | 12,00,000 |
| Other fixed costs | - | - | 4,00,000 |
| ***Profit*** | | | ***8,50,000*** |

***Working notes:***

***Variable factory overheads rate*** = (Variable Factory OH ÷ Direct wages) × 100
= (9,50,000 ÷ 12,50,000) × 100 = ***76% of Direct wages***

### *(2) Product-wise Profitability Statement for the FY 2022-23*

| *Particulars* | *Product X 6,400 units* | *Product Y 3,600 units* | *Total* |
|---|---|---|---|
| ***Sales value @ ₹480/₹440 per unit*** | ***30,72,000*** | ***15,84,000*** | ***46,56,000*** |
| ***Less: Variable Cost:*** | | | |
| Direct Material @ ₹140/₹157.50 per unit | 8,96,000 | 5,67,000 | 14,63,000 |
| Direct wages @ ₹108/₹159 per unit | 6,91,200 | 5,72,400 | 12,63,600 |
| Variable factory OH @ 76% of Direct wages | 5,25,312 | 4,35,024 | 9,60,336 |
| Other Variable cost @ ₹40/₹70 per unit | 2,56,000 | 2,52,000 | 5,08,000 |
| ***Contribution*** | ***7,03,488*** | ***(2,42,424)*** | ***4,61,064*** |
| ***Less: Fixed Cost:*** | | | |
| Fixed factory overhead | - | - | 12,00,000 |
| Other fixed costs | - | - | 4,40,000 |
| ***Profit/(Loss)*** | | | ***(11,78,936)*** |

### *BQ 20*

The cost accountant of manufacturing company provides you the following details for the year 2022:

| | | | |
|---|---|---|---|
| Direct materials | ₹1,75,000 | Other variable costs | ₹80,000 |
| Direct wages | ₹1,00,000 | Other fixed costs | ₹80,000 |
| Fixed factory overheads | ₹1,00,000 | Profit | ₹1,15,000 |
| Variable factory overheads | ₹1,00,000 | Sales | ₹7,50,000 |

***During the year, the company manufactured two products A and B and the output and costs were:***

| | *A* | *B* |
|---|---|---|
| Output (units) | 2,00,000 | 1,00,000 |
| Selling price per unit | ₹2.00 | ₹3.50 |
| Direct materials per unit | ₹0.50 | ₹0.75 |
| Direct wages per unit | ₹0.25 | ₹0.50 |

Variable factory overhead are absorbed as a percentage of direct wages. Other variable costs have been computed as: Product A ₹0.25 per unit; and B ₹0.30 per unit.

During 2023, it is expected that the demand of product A will fall by 25% and for B by 50%. It is decided to manufacture a further product C, the cost for which are estimated as follows:

| | *C* |
|---|---|
| Output (units) | 2,00,000 |
| Selling price per unit | ₹1.75 |

| | |
|---|---|
| Direct materials per unit | ₹0.40 |
| Direct wages per unit | ₹0.25 |

It is anticipated that the other variable cost per unit will be the same as for product A.

***Prepare a budget to present to the management, showing the current position and the position for 2023. Comment on the comparative results.***

## *Answer*

***Budget Showing Current Position and Position for 2023***

| Particulars | Position for 2022 | | | Position for 2023 | | | |
|---|---|---|---|---|---|---|---|
| | A | B | Total | A | B | C | Total |
| Sales (Units) | 2,00,000 | 1,00,000 | 3,00,000 | 1,50,000 | 50,000 | 2,00,000 | 4,00,000 |
| Sales (in ₹) | 4,00,000 | 3,50,000 | 7,50,000 | 3,00,000 | 1,75,000 | 3,50,000 | 8,25,000 |
| Direct materials | 1,00,000 | 75,000 | 1,75,000 | 75,000 | 37,500 | 80,000 | 1,92,500 |
| Direct wages | 50,000 | 50,000 | 1,00,000 | 37,500 | 25,000 | 50,000 | 1,12,500 |
| Factory OH (V) | 50,000 | 50,000 | 1,00,000 | 37,500 | 25,000 | 50,000 | 1,12,500 |
| Other cost (V) | 50,000 | 30,000 | 80,000 | 37,500 | 15,000 | 50,000 | 1,02,500 |
| ***Marginal Cost*** | ***2,50,000*** | ***2,05,000*** | ***4,55,000*** | ***1,87,500*** | ***1,02,500*** | ***2,30,000*** | ***5,20,000*** |
| ***Contribution*** | ***1,50,000*** | ***1,45,000*** | ***2,95,000*** | ***1,12,500*** | ***72,500*** | ***1,20,000*** | ***3,05,000*** |
| Less: Fixed cost | | | | | | | |
| Factory | | | 1,00,000 | | | | 1,00,000 |
| Other | | | 80,000 | | | | 80,000 |
| ***Profit*** | | | ***1,15,000*** | | | | ***1,25,000*** |

***Comment:*** Introduction of Product C is likely to increase profit by 10,000 (i.e. from 1,15,000 to 1,25,000) in 2023 as compared to 2022. Therefore, introduction of product C is recommended.

## *BQ 21*

Concorde Ltd. manufactures two products using two types of materials and one grade of labour. Shown below is an extract from the company's working papers for the next month's budget:

| | ***Product A*** | ***Product B*** |
|---|---|---|
| Budgeted sales (in units) | 2,400 | 3,600 |
| Budgeted material consumption per unit (in kg): | | |
| Material X | 5 | 3 |
| Material Y | 4 | 6 |
| Standard labour hours allowed per unit of product | 3 | 5 |

Material X and Material Y cost ₹4 and ₹6 per kg and labours are paid 25 per hour. Overtime premium is 50% and is payable, if a worker works for more than 40 hours a week. There are 180 direct workers.

The target productivity ratio (or efficiency ratio) for the productive hours worked by the direct workers in actually manufacturing the products is 80%. In addition the non-productive down-time is budgeted at 20% of the productive hours worked.

There are four 5-days weeks in the budgeted period and it is anticipated that sales and production will occur evenly throughout the whole period.

***It is anticipated that stock at the beginning of the period will be:***

| | |
|---|---|
| Product A | 400 units |
| Product B | 200 units |
| Material X | 1,000 kg |
| Material Y | 500 kg |

***The anticipated closing stocks for the budgeted period are as below:***

| | |
|---|---|
| Product A | 4 days sales |
| Product B | 5 days sales |
| Material X | 10 days consumption |
| Material Y | 6 days consumption |

***Calculate the Materials Purchase Budget and Wages Budget for the direct workers, showing the quantities and values, for the month.***

## *Answer*

### *(i) Material Purchase Budget*

| Particulars | Material X | Material Y |
|---|---|---|
| Materials consumed: | | |
| Product A @ 5 kg/4 kg per unit of 2,480 units | 12,400 | 9,920 |
| Product B @ 3 kg/6 kg per unit of 4,300 units | 12,900 | 25,800 |
| Total consumption (in kg) | 25,300 | 35,720 |
| Add: Closing Stock: | | |
| Materials X $(^{25,300}/_{20 \text{ days}} \times 10 \text{ days})$ | 12,650 | - |
| Materials Y $(^{35,720}/_{20 \text{ days}} \times 6 \text{ days})$ | - | 10,716 |
| Less: Opening Stock of Raw Material | (1,000) | (500) |
| ***Quantity of materials to be purchased (in kg)*** | ***36,950*** | ***45,936*** |
| Rate per kg | ₹4 | ₹6 |
| ***Material Purchase (in ₹)*** | ***₹1,47,800*** | ***₹2,75,616*** |

### *(ii) Wages Budget*

| Particulars | Product A | Product B |
|---|---|---|
| Units to be produced | 2,480 | 4,300 |
| Standard hours allowed per unit | 3 | 5 |
| Total standard hours allowed | 7,440 | 21,500 |
| Productive hours required for production (80% efficiency) | | |
| Product A (7,440 ÷ 80%) | 9,300 | - |
| Product A (21,500 ÷ 80%) | - | 26,875 |
| Add: Non-productive down time @ 20% of productive hours | 1,860 | 5,375 |
| ***Total hours to be paid*** | ***11,160*** | ***32,250*** |
| Total hours to be paid (11,160 + 32,250) | | 43,410 |
| Normal hours (4 weeks × 40 hours × 180 workers) | | 28,800 |
| Overtime hours (43,410 – 28,800) | | 14,610 |
| ***Wages to be paid:*** | | |
| Normal hours @ ₹25 per hour for 28,800 hours | | ₹7,20,000 |
| Overtime hours @ ₹37.50 (25 + 50%) per hour for 14,610 hours | | ₹5,47,875 |
| ***Total Wages paid (in ₹)*** | | ***₹12,67,875*** |

***Working notes:***

***(1)*** Number of days in budget period = 4 weeks × 5 days = 20 days

***(2) Calculation of number of units to be produced:***

| Particulars | Product A | Product B |
|---|---|---|
| Units to be sold | 2,400 | 3,600 |
| Add: Closing Stock: | | |
| Product A $(^{2,400}/_{20 \text{ days}} \times 4 \text{ days})$ | 480 | - |
| Product B $(^{3,600}/_{20 \text{ days}} \times 5 \text{ days})$ | - | 900 |
| Less: Opening Stock | (400) | (200) |
| ***Units to be produced*** | ***2,480*** | ***4,300*** |

***BQ 22***

G Ltd. manufactures company manufactures two products called 'M' and 'N'. both products use a common raw materials 'Z'. The raw material Z is purchased at the rate of ₹36 per kg. from the market. The management has decided to review inventory management policies for the forthcoming year.

The following information has been extracted from the departmental estimates for the year ended 31st March, (the budgeted period):

| | ***Product M*** | ***Product N*** |
|---|---|---|
| Sales in units | 28,000 | 13,000 |
| Finished goods stock increased by year end in units | 320 | 160 |
| Post-production rejection rate (%) | 4 | 6 |
| Material Z per computed unit, net of wastage | 5 kg | 6 kg |
| Material Z wastage in % | 10 | 5 |

***Additional information available is as under:***

- Usage of raw material Z is expected to be at constant rate over the period.
- Annual cost of holding one unit of raw material Z in stock is 11% of the material cost.
- The cost of placing an order is 320 per order.
- The management of G Ltd. has decided that there should not be more than 40 orders in a year for the raw material Z.

***You are required to:***

***(a)*** Prepare functional budgets for the year ended 31st March under the following categories:

*i.* Production budget for product M and N in units.
*ii.* Purchase budget for raw material Z in kg and value.

***(b)*** Calculate economic order quantity (EOQ) in kg for raw material Z (in kgs and value).

***(c)*** If there is a sole supplier for the raw material Z in the market and the supplier do not sale more than 4,000 kg. of material Z at a time. Keeping the management purchase policy and production quantity mix into consideration. Calculate the maximum number of units of product M and N that could be produced.

***Answer***

***(a) (i) Production Budget for the year (in Quantity)***

| ***Particulars (in units)*** | ***Product M*** | ***Product N*** |
|---|---|---|
| Sales (in units) | 28,000 | 13,000 |
| Add: Increase in Closing Stock | 320 | 160 |
| ***Budgeted Production after rejection*** | ***28,320*** | ***13,160*** |
| Add: Post rejection @ 4%/6% | 1,180<br>[(28,320÷96%) × 4%] | 840<br>[(13,160÷94%) × 6%] |
| ***Budgeted Production before rejection*** | ***29,500*** | ***14,000*** |

***(a) (ii) Raw Material Z Purchase Budget***

| ***Particulars*** | ***Product A*** | ***Product B*** |
|---|---|---|
| Budgeted Production in units | 29,500 | 14,000 |
| Raw Material Consumption for one unit | 5 kg | 6 kg |
| ***Materials to be Purchased net of wastage*** | ***1,47,500*** | ***84,000*** |
| Add: Wastage @ 10%/5% | 16,389<br>[(1,47,500÷90%)× 10%] | 4,421<br>[(84,000÷95%) × 5%] |
| ***Materials to be Purchased*** | ***1,63,889*** | ***88,421*** |
| ***Materials to be Purchased in kg (1,63,889 + 88,421)*** | | ***2,52,310*** |
| ***Materials to be Purchased in value @ ₹36 of 2,52,310*** | | ***₹90,83,160*** |

***(b)*** Economic order quantity $= \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 2{,}52{,}310 \times 320}{36 \times 11\%}} =$ ***6,386 kgs or ₹2,29,896***

*(c)* Since, the maximum number of order per year cannot be more than 40 orders and the maximum quantity per order that can be purchased is 4,000 kg. Hence, the total quantity of material Z that can be available for production is 1,60,000 kg. (4,000 kg. × 40 orders).

| | ***Product M*** | ***Product N*** |
|---|---|---|
| Material purchased in kg (maintaining same production mix) | 1,03,929 $\left(1{,}60{,}000 \times \frac{1{,}63{,}889}{2{,}52{,}310}\right)$ | 56,071 $\left(1{,}60{,}000 \times \frac{88{,}421}{2{,}52{,}310}\right)$ |
| Less: Wastage in kg @10%/5% | 10,393 | 2,804 |
| Net material available for production in kg | 93,536 | 53,267 |
| ***Unit to be produced before rejection*** | ***18,707 units*** $\left(\frac{93{,}536 \text{ kg}}{5 \text{ kg}}\right)$ | ***8,878 units*** $\left(\frac{53267, \text{kg}}{6 \text{ kg}}\right)$ |

## *BQ 23*

A company is engaged in the manufacture of specialised sub-assemblies required for certain electronic equipment. The company envisages that in the forthcoming month, December, the sales will take a pattern in the ratio of 3 : 4 : 2 respectively of sub-assemblies, ACB, MCB and DP.

***The following is the schedule of components required for manufacture:***

| ***Sub-assembly*** | ***Selling Price (₹)*** | ***Component Requirements*** | | | |
|---|---|---|---|---|---|
| | | ***Base Board*** | ***IC08*** | ***IC12*** | ***IC26*** |
| ACB | 520 | 1 | 8 | 4 | 2 |
| MCB | 500 | 1 | 2 | 10 | 6 |
| DP | 350 | 1 | 2 | 4 | 8 |
| Purchase Price (₹) | - | 60 | 20 | 12 | 8 |

***The direct labour time and variable overheads required for each of the sub-assemblies are:***

| ***Particulars*** | ***Labour hours*** | | ***Variable overheads*** |
|---|---|---|---|
| | ***Grade A*** | ***Grade B*** | |
| ACB | 8 | 16 | 36 |
| MCB | 6 | 12 | 24 |
| DP | 4 | 8 | 24 |
| Direct wage rate per hour (₹) | 5 | 4 | - |

The labourers work 8 hours a day for 25 days a month.

***The opening stocks of sub-assemblies and components for December are as under:***

| ***ACB*** | ***MCB*** | ***DP*** | ***Base Board*** | ***IC08*** | ***IC12*** | ***IC26*** |
|---|---|---|---|---|---|---|
| 800 | 1,200 | 2,800 | 1,600 | 1,200 | 6,000 | 4,000 |

Fixed overheads amount to ₹7,57,200 for the month and a monthly profit target of ₹12,00,000 has been set. The company is eager for a reduction of *closing inventories for December of sub-assemblies and components by 10% of quantity as compared to the opening stock.

***Prepare the following budgets for December:***

*(a)* Sales budget in quantity and value.
*(b)* Production budget in quantity
*(c)* Component usage budget in quantity.
*(d)* Component purchase budget in quantity and value.
*(e)* Manpower budget showing the number of workers and the amount of wages payable.

## *Answer*

***Working notes:***

| | | | | |
|---|---|---|---|---|
| *1.* Desired contribution | = | Fixed cost + Profit | | |
| | = | 7,57,200 + 12,00,000 | = | 19,57,200 |

**2. *Calculation of contribution per unit:***

| Particulars | ACB (₹) | MCB (₹) | DP (₹) |
|---|---|---|---|
| **Selling price per unit** | **520** | **500** | **350** |
| Variable cost per unit: | | | |
| Components: | | | |
| Base board | (1 × 60) = 60 | (1 × 60) = 60 | (1 × 60) = 60 |
| IC08 | (8 × 20) = 160 | (2 × 20) = 40 | (2 × 20) = 40 |
| IC12 | (4 × 12) = 48 | (10 × 12) = 120 | (4 × 12) = 48 |
| IC26 | (2 × 8) = 16 | (6 × 8) = 48 | (8 × 8) = 64 |
| Labour: | | | |
| Grade A | (8 × 5) = 40 | (6 × 5) = 30 | (4 × 5) = 20 |
| Grade B | (16 × 4) = 64 | (12 × 4) = 48 | (8 × 4) = 32 |
| Variable production overheads | 36 | 24 | 24 |
| **Total Variable Cost per unit** | **424** | **370** | **288** |
| **Contribution per unit** | **96** | **130** | **62** |

**3.** Number of units required = Desired contribution ÷ Composite contribution per unit
= 19,57,200 ÷ 103.555 = 18,900 units

Units of ACB = 18,900 × 3/9 = 6,300 units
Units of MCB = 18,900 × 4/9 = 8,400 units
Units of DP = 18,900 × 2/9 = 4,200 units

**4.** Composite contribution p.u. = (96 × 3 + 130 × 4 + 62 × 2) ÷ 9 = 103.555 per unit

***(a) Sales Budget in Quantity and Value***

| Particulars | ACB | MCB | DP | Total |
|---|---|---|---|---|
| Sales in quantity in 3 : 4 : 2 | 6,300 | 8,400 | 4,200 | 18,900 |
| Selling price per unit (₹) | 520 | 500 | 350 | - |
| Sales value (₹) | 32,76,000 | 42,00,000 | 14,70,000 | 89,46,000 |

***(b) Production Budget in Quantity***

| Particulars | ACB | MCB | DP |
|---|---|---|---|
| Sales in units | 6,300 | 8,400 | 4,200 |
| Add: Closing stock (10% less than opening stock) | 720 | 1,080 | 2,520 |
| Less: Opening stock | (800) | (1,200) | (2,800) |
| ***Production in units*** | ***6,220*** | ***8,280*** | ***3,920*** |

***(c) Component Usage Budget in Quantity***

| Particulars | ACB | MCB | DP | Total |
|---|---|---|---|---|
| Production in quantity | 6,220 | 8,280 | 3,920 | - |
| Base board (1 each) | 6,220 | 8,280 | 3,920 | 18,420 |
| IC08 (8, 2 and 2 per unit) | 49,760 | 16,560 | 7,840 | 74,160 |
| IC12 (4, 10 and 4 per unit) | 24,880 | 82,800 | 15,680 | 1,23,360 |
| IC26 (2, 6 and 8 per unit) | 12,440 | 49,680 | 31,360 | 93,480 |

***(d) Component Purchase Budget in Quantity and Value***

| Particulars | Base Board | IC08 | IC12 | IC26 | Total |
|---|---|---|---|---|---|
| Usage in production | 18,420 | 74,160 | 1,23,360 | 93,480 | - |
| Add: Closing stock (10% less than opening) | 1,440 | 1,080 | 5,400 | 3,600 | - |
| Less: Opening stock | (1,600) | (1,200) | (6,000) | (4,000) | - |
| Purchase in quantity | 18,260 | 74,040 | 1,22,760 | 93,080 | 3,08,140 |
| Purchase price per unit (₹) | 60 | 20 | 12 | 8 | - |
| Purchase value (₹) | 10,95,600 | 14,80,800 | 14,73,120 | 7,44,640 | 47,94,160 |

### (e) Manpower Budget Showing the Number of Workers and the Amount of Wages Payable

| Particulars | Budgeted Production | Grade A | | Grade B | | Total |
|---|---|---|---|---|---|---|
| | | Hours Per Unit | Total Hours | Hours Per Unit | Total Hours | |
| ACB | 6,220 | 8 | 49,760 | 16 | 99,520 | |
| MCB | 8,280 | 6 | 49,680 | 12 | 99,360 | |
| DP | 3,920 | 4 | 15,680 | 8 | 31,360 | |
| (A) Total hours | | | 1,15,120 | | 2,30,240 | |
| (B) Hours per man per month (8 hours × 25 days) | | | 200 | | 200 | |
| (C) Number of workers per month (A ÷ B) | | | 576 | | 1,152 | 1,728 |
| (D) Wage rate per month (200 hours × ₹5/₹4) | | | 1,000 | | 800 | |
| (E) Wages payable (C × D) | | | 5,76,000 | | 9,21,600 | 14,97,600 |

# PAST YEAR QUESTIONS

## PYQ 1

Following is the sales budget for the first six months of the year 2009 in respect of PQR Ltd:

| Month | : | January | February | March | April | May | June |
|---|---|---|---|---|---|---|---|
| Sales (units) | : | 10,000 | 12,000 | 14,000 | 15,000 | 15,000 | 16,000 |

Finished goods inventory at the end of each month is expected to be 20% of budgeted sales quantity for the following month. Finished goods inventory was 2,700 units on January 1, 2009. There would be no work-in-progress at the end of any month. Each unit of finished product requires two types of materials as detailed below:

| | | |
|---|---|---|
| Material X | : | 4 kg @ ₹10 per kg |
| Material Y | : | 6 kg @ ₹15 per kg |

Material on hand on January 1, 2009 was 19,000 kg of material X and 29,000 kg of material Y. Monthly closing stock of material is budgeted to be equal to half of the requirements of next month's production.

| | | |
|---|---|---|
| Budgeted direct labour hour | : | ¾ hour for one of finished product |
| Budgeted direct labour cost | : | ₹10,89,000 for the first quarter of 2009 |

***Actual data for the quarter one ended on March 31, 2009 is as under:***

| | | |
|---|---|---|
| Actual production quantity | : | 40,000 units |
| Direct material cost | | |
| Material X | : | 1,65,000 kg @ ₹10.20 per kg |
| Material Y | : | 2,38,000 kg @ ₹15.10 per kg |

(Purchase cost based on materials actually issued to production)

| | | |
|---|---|---|
| Actual direct labour hours worked | : | 32,000 hours |
| Actual direct labour cost | : | ₹13,12,000 |

***Required:***

1. ***Prepare the following budgets:***
   a. Monthly production quantity budget for the quarter one.
   b. Monthly raw material consumption quantity budget from January, 2009 to April, 2009.
   c. Materials purchase quantity budget for the quarter one.

2. ***Compute the following variances:***
   a. Material cost variance
   b. Material price variance
   c. Material usage variance
   d. Direct labour cost variance
   e. Direct labour rate variance
   f. Direct labour efficiency variance

***[(6 + 9 = 15 Marks) May 2009]***

## Answer

***1. Various Budgets:***

***a. Production Budget for Quarter One (in Quantity)***

| Particulars (in units) | January | February | March | April |
|---|---|---|---|---|
| Budgeted Sales (in units) | 10,000 | 12,000 | 14,000 | 15,000 |
| Add: Expected Closing Stock (20% of sales of next month) | 2,400 | 2,800 | 3,000 | 3,000 |
| Less: Opening Stock | (2,700) | (2,400) | (2,800) | (3,000) |
| ***Budgeted Production*** | ***9,700*** | ***12,400*** | ***14,200*** | ***15,000*** |

Total Budgeted Production for the Quarter 1 = (9,700 + 12,400 + 14,200) = 6,300 units

**b. Raw Material consumption quantity budget from January to April 2009**

| Month | Budgeted Production (Units) | Material X @ 4 kg per unit (Kg) | Material Y @ 6 kg per unit (Kg) |
|---|---|---|---|
| January | 9,700 | 38,800 | 58,200 |
| February | 12,400 | 49,600 | 74,400 |
| March | 14,200 | 56,800 | 85,200 |
| April | 15,000 | 60,000 | 90,000 |
| **Total** | **51,300** | **2,05,200** | **3,07,800** |

**c. Raw Material Purchase Quantity Budget for the Quarter One**

| Particulars (in Unit) | X | Y |
|---|---|---|
| Raw Material Consumption for Quarter One (9,700 + 12,400 + 14,200) × 4 kg/6kg | 1,45,200 | 2,17,800 |
| Add: Closing Stock (50% of Next Month Requirement) | 30,000 (50% of 15,000 × 4kg) | 45,000 (50% of 15,000 × 6 kg) |
| Less : Opening Stock of Raw Material | (19,000) | (29,000) |
| **Materials to be Purchased** | **1,56,200** | **2,33,800** |

**2. Calculation of various variances:**

**a. Material cost variance** = (SQ × SP) – (AQ × AP) = 52,00,000 – 52,76,800
= **76,800 A**

**b. Material price variance** = (AQ × SP) – (AQ × AP) = 52,20,000 – 52,76,800
= **56,800 A**

**c. Material usage variance** = (SQ × SP) – (AQ × SP) = 52,00,000 – 52,20,000
= **20,000 A**

**d. Labour cost variance** = (SH × *SR) – (AH × AR)
= (40,000 units × ¾ hour × ₹40) – 13,12,000
= 12,00,000 – 13,12,000 = **1,12,000 A**

**e. Labour rate variance** = (AH × SR) – (AH × AR)
= (32,000 hours × ₹40) – 13,12,000
= 12,80,000 – 13,12000 = **32,000 A**

**f. Labour efficiency variance** = (SH × SR) - (AH × SR)
= (40,000 units × ¾ hour × ₹40) – 12,80,000 = **80,000 A**

**Working:**

**(a) Material Analysis Table**

| Materials | SQ × SP | RQ × SP | AQ used × SP | AQ used × AP |
|---|---|---|---|---|
| **X** | 40,000 units × 4 kg × ₹10 | 1,61,200 × ₹10 | 1,65,000 × ₹10 | 1,65,000 × ₹10.20 |
| **Y** | 40,000 units × 6 kg × ₹15 | 2,41,800 × ₹15 | 2,38,000 × ₹15 | 2,38,000 × ₹15.10 |
| **Total** | **52,00,000** | **52,39,000** | **52,20,000** | **52,76,800** |

**Revised Quantity** = Total actual quantity used in standard mix ratio
Total Actual quantity used = 1,65,000 + 2,38,000 = 4,03,000 kg
Standard mix ratio = 4 : 6

**Revised Quantity of X** = (4 ÷ 10) × 4,03,000 = **1,61,200 kg**
**Revised Quantity of Y** = (6 ÷ 10) × 4,03,000 = **2,41,800 kg**

**(b) Budgeted hours for quarter one** = Budget Production × Budgeted Time per unit
= 36,300 units × ¾ hours per unit = **27,225 hours**

***SH/ Standard Hours** = Budgeted labour cost ÷ Budgeted labour hours
= 10,89,000 ÷ 27,225 = **₹40**

***PYQ 2***

AK Limited produces and sells a single product. Sales budget for calendar year 2012 by quarters is as under:

| ***Quarters*** | ***I*** | ***II*** | ***III*** | ***IV*** |
|---|---|---|---|---|
| ***No. of units to be sold*** | 18,000 | 22,000 | 25,000 | 27,000 |

The year is expected to open with an inventory of 6,000 units of finished products and close with inventory of 8,000 units. Production is customarily scheduled to provide for 70% of the current quarter's sales demand plus 30% of the following quarter demand. The budgeted selling price per unit is ₹40.

***The standard cost details for one unit of the product are as follows:***

| | | |
|---|---|---|
| Variable Cost | : | ₹34.50 per unit. |
| Fixed Overheads | : | 2 hours 30 minutes @ ₹2 per hour |

Fixed overheads are based on a budgeted production volume of 1,10,000 direct labour hours for the year, fixed overheads are evenly distributed through-out the year.

***You are required to:***

***(i)*** Prepare Quarterly Production Budget for the year.

***(ii)*** In which quarter of the year, company expected to achieve break-even point.

***[(5 Marks) May 2012]***

## ***Answer***

***(i) Production Budget (Quarterly)***

| ***Particular*** | ***I Q*** | ***II Q*** | ***III Q*** | ***IV Q*** |
|---|---|---|---|---|
| 70% of current quarter | 12,600 | 15,400 | 17,500 | 18,900 |
| 30% of following quarter | 6,600 | 7,500 | 8,100 | 7,400 (b.f.) |
| ***Production (in units)*** | ***19,200*** | ***22,900*** | ***25,600*** | ****26,300*** |

****Production in Quarter IV*** = Total production – Production upto III quarter
= 94,000 – 67,700 = ***26,300 units***

***Total production*** = Units to be sold + Closing inventory – Opening inventory
= (18,000 + 22,000 + 25,000 + 27,000) + 8,000 – 6,000
= ***94,000 units***

***Production upto Quarter III*** = 19,200 + 22,900 + 25,600 = ***67,700 units***

***(ii)*** ***B.E.P. (in units)*** = $\frac{\text{Fixed cos t}}{\text{Conttribut ion P.U.}} = \frac{2{,}20{,}000}{5.50}$ = ***40,000 units***

Calculation of fixed cost = 1,10,000 labour hours × ₹2 per hour = ***2,20,000***

Contribution per unit = Sale price per unit – Variable cost per unit
= 40 – 34.50 = ***₹5.50 p.u.***

***In second quarter company is expected to achieve break - even point i.e. 40,000 units (18,000 + 22,000).***

***PYQ 3***

Pentax Limited has prepared its expense budget for 20,000 units in its factory for the year 2013 as detailed below:

| | ***₹ per unit*** |
|---|---|
| Direct Material | 50 |
| Direct Labour | 20 |
| Variable Overhead | 15 |
| Direct Expenses | 6 |
| Selling Expenses (20% Fixed) | 15 |
| Factory Expenses (100% Fixed) | 7 |

| | |
|---|---|
| Administration Expenses (100% Fixed) | 4 |
| Distribution Expenses (85% Variable) | 12 |
| Total | ***129*** |

***Prepare an expense budget for the production of 15,000 units and 18,000 units.***

***[(8 Marks) May 13]***

## *Answer*

***Expenses Budget***

| ***Particulars*** | ***20,000 unit*** | ***15,000 unit*** | ***18,000 unit*** |
|---|---|---|---|
| ***(A) Variable Cost:*** | | | |
| Direct Materials @ ₹50 per unit | 10,00,000 | 7,50,000 | 9,00,000 |
| Direct Labour @ ₹20 per unit | 4,00,000 | 3,00,000 | 3,60,000 |
| Variable Overhead @ ₹15 per unit | 3,00,000 | 2,25,000 | 2,70,000 |
| Direct Expenses @ ₹6 per unit | 1,20,000 | 90,000 | 1,08,000 |
| ***Total (A)*** | ***18,20,000*** | ***13,65,000*** | ***16,38,000*** |
| ***(B) Fixed Cost:*** | | | |
| Factory Expenses (₹7 × 20,000 units) | 1,40,000 | 1,40,000 | 1,40,000 |
| Administration Expenses (₹4 × 20,000 units) | 80,000 | 80,000 | 80,000 |
| ***Total (B)*** | ***2,20,000*** | ***2,20,000*** | ***2,20,000*** |
| ***(C) Semi Variable Cost:*** | | | |
| Selling Expenses: | | | |
| Variable @ ₹12 per unit | 2,40,000 | 1,80,000 | 2,16,000 |
| Fixed (₹3 × 20,000) | 60,000 | 60,000 | 60,000 |
| Distribution Expenses: | | | |
| Variable @ ₹10.20 per unit (85% of ₹12) | 2,04,000 | 1,53,000 | 1,83,600 |
| Fixed (₹1.80 × 20,000 units) | 36,000 | 36,000 | 36,000 |
| ***Total (C)*** | ***5,40,000*** | ***4,29,000*** | ***4,95,600*** |
| ***Total Expenses (A + B + C)*** | ***25,80,000*** | ***20,14,000*** | ***23,53,600*** |

## *PYQ 4*

RST Limited is presently operating at 50% capacity and producing 30,000 units. The entire output is sold at a price of ₹200 per unit. The cost structure at 50% level of activity is as under:

| | |
|---|---|
| Direct Material | ₹75 per unit |
| Direct Wages | ₹25 per unit |
| Variable Overheads | ₹25 per unit |
| Direct Expenses | ₹15 per unit |
| Factory Expenses (25% Fixed) | ₹20 per unit |
| Selling and Distribution Expenses (80% Variable) | ₹10 per unit |
| Office and Administrative Expenses (100% Fixed) | ₹5 per unit |

The company anticipates that the variable costs will go up by 10% and fixed costs will go up by 15%.

***You are required to prepare an Expense Budget, on the basis of marginal cost for the company at 50% and 60% level of activity and find out the profit at respective levels.***

***[(8 Marks) Nov 2014]***

## *Answer*

***Expenses Budget of RST Ltd***

| ***Particulars*** | ***Per Unit (₹)*** | ***30,000 units (₹)*** | ***36,000 units (₹)*** |
|---|---|---|---|
| ***(A) Sales*** | 200.00 | 60,00,000 | 72,00,000 |
| ***(B) Variable Cost:*** | | | |
| Direct Material (₹75 + 10%) | 82.50 | 24,75,000 | 29,70,000 |
| Direct Wages (₹25 + 10%) | 27.50 | 8,25,000 | 9,90,000 |
| Variable Overhead (₹25 + 10%) | 27.50 | 8,25,000 | 9,90,000 |

| | | | |
|---|---|---|---|
| Direct Expenses (₹15 + 10%) | 16.50 | 4,95,000 | 5,94,000 |
| Variable Factory Expenses (₹20 × 75% + 10%) | 16.50 | 4,95,000 | 5,94,000 |
| Variable Selling and Distribution Expenses (₹10 × 80% + 10%) | 8.80 | 2,64,000 | 3,16,800 |
| ***Total (B)*** | ***179.30*** | ***53,79,000*** | ***64,54,800*** |
| ***(C) Contribution (A - B)*** | ***20.70*** | ***6,21,000*** | ***7,45,200*** |
| ***(D) Fixed Cost:*** | | | |
| Office and Administration Expenses (₹5 × 100% × 30,000 units + 15%) | - | 1,72,500 | 1,72,500 |
| Factory Expenses (₹20 × 25% × 30,000 units + 15%) | - | 1,72,500 | 1,72,500 |
| Selling and Distribution Expenses (₹10 × 20% × 30,000 units + 15%) | - | 69,000 | 69,000 |
| ***Total (D)*** | - | ***4,14,000*** | ***4,14,000*** |
| ***Net Profit (C - D)*** | - | ***2,07,000*** | ***3,31,200*** |

***PYQ 5***

XYZ company is drawing a production plan for its two products XML and YML for the year 2015-16. The company's policy is to maintain a closing stock of finished goods at 25% of the anticipated volume of the sales of the succeeding month.

***The following are the estimated data for two products:***

| | ***XML*** | ***YML*** |
|---|---|---|
| Budgeted production in units | 2,00,000 | 1,50,000 |
| Direct material per unit | ₹220.00 | ₹280.00 |
| Direct labour per unit | ₹130.00 | ₹120.00 |
| Other manufacturing expenses | ₹4,00,000 | ₹5,00,000 |

***The estimated units to be sold in the first 4 months of the year 2015-16 are as under:***

| | ***April*** | ***May*** | ***June*** | ***July*** |
|---|---|---|---|---|
| ***XML*** | 8,000 | 10,000 | 12,000 | 16,000 |
| ***YML*** | 6,000 | 8,000 | 9,000 | 14,000 |

***Prepare:***

***(i)*** Production Budget (Month wise)

***(ii)*** Production Cost Budget (for first quarter of the year)

***[(5 Marks) May 2015]***

***Answer***

***(i) Production Budget***

| ***Product XML*** | | | |
|---|---|---|---|
| ***Particulars*** | ***April*** | ***May*** | ***June*** |
| Budgeted Sales (in units) | 8,000 | 10,000 | 12,000 |
| Add: Expected Closing Stock (25% of sales of next month) | 2,500 | 3,000 | 4,000 |
| Less: Opening Stock | (2,000) | (2,500) | (3,000) |
| ***Total Production*** | ***8,500*** | ***10,500*** | ***13,000*** |
| ***Product YML*** | | | |
| ***Particulars*** | ***April*** | ***May*** | ***June*** |
| Budgeted Sales (in units) | 6,000 | 8,000 | 9,000 |
| Add: Expected Closing Stock (25% of sales of next month) | 2,000 | 2,250 | 3,500 |
| Less: Opening Stock | (1,500) | (2,000) | (2,250) |
| ***Total Production*** | ***6,500*** | ***8,250*** | ***10,250*** |

***(ii) Production Cost Budget***

| ***Particulars*** | ***XML*** | ***YML*** |
|---|---|---|
| No of units expected to be produced during first quarter | 32,000 | 25,000 |

| | | |
|---|---|---|
| Direct material @ ₹220/ ₹280 per unit | 70,40,000 | 70,00,000 |
| Direct labour @ ₹130/ ₹120 per unit | 41,60,000 | 30,00,000 |
| Other manufacturing expenses @ ₹2 / ₹3.33 per unit | 64,000 | 83,333 |
| ***Total Production Cost*** | ***1,12,64,000*** | ***1,00,83,333*** |

***Note:*** Other manufacturing expenses are apportioned on the basis of no of units, one student may apportion these expenses on the basis of period i.e. ₹1,00,000 for quarter first in case of XML.

### *PYQ 6*

XY Co. Ltd manufactures two products viz. X and Y and sells them through two divisions, East and West. For the purpose of Sales budget to the Budget Committee, following information has been made available for the year 2014 – 2015:

| *Product* | *Budgeted Sales* | | *Actual Sales* | |
|---|---|---|---|---|
| | *East Division* | *West Division* | *East Division* | *West Division* |
| *X* | 400 units at ₹9 | 600 units at ₹9 | 500 units at ₹9 | 700 units at ₹9 |
| *Y* | 300 units at ₹21 | 500 units at ₹21 | 200 units at ₹21 | 400 units at ₹21 |

Adequate market studies reveal that product X is popular but under priced. It is expected that if the price of X is increased by ₹1, it will find a ready market. On the other hand, Y is overpriced and if the price of Y is reduced by ₹1, it will have more demand in the market. The company management has agreed for the aforesaid price changes. On the basis of these price changes and the reports of salesmen, following estimates have been prepared by the Divisional Managers:

***Percentage increase in sales over budgeted sales:***

| *Product* | *East Division* | *West Division* |
|---|---|---|
| *X* | + 10% | + 5% |
| *Y* | + 20% | + 10% |

With the help of the intensive advertisement campaign, following additional sales (over and above the above mentioned estimated sales by Divisional Managers) are possible:

| *Product* | *East Division* | *West Division* |
|---|---|---|
| *X* | 60 units | 70 units |
| *Y* | 40 units | 50 units |

***You are required to prepare Sales Budget 2015 – 2016 after incorporating above estimates and also show the Budgeted Sales and Actual Sales of 2014 – 2015.***

***[(8 Marks) Nov 2015]***

### *Answer*

***1. Statement Showing Sales Budget for 2015-16***

| *Division* | *Product X* | | | *Product Y* | | | *Total* |
|---|---|---|---|---|---|---|---|
| | *Qty.* | *Rate (₹)* | *Amount (₹)* | *Qty.* | *Rate (₹)* | *Amount (₹)* | *Amount (₹)* |
| East | 500 | 10 | 5,000 | 400 | 20 | 8,000 | 13,000 |
| West | 700 | 10 | 7,000 | 600 | 20 | 12,000 | 19,000 |
| *Total* | *1,200* | *-* | *12,000* | *1,000* | *-* | *20,000* | *32,000* |

***2. Statement Showing Sales Budget for 2014-15***

| *Division* | *Product X* | | | *Product Y* | | | *Total* |
|---|---|---|---|---|---|---|---|
| | *Qty.* | *Rate (₹)* | *Amount (₹)* | *Qty.* | *Rate (₹)* | *Amount (₹)* | *Amount (₹)* |
| East | 400 | 9 | 3,600 | 300 | 21 | 6,300 | 9,900 |
| West | 600 | 9 | 5,400 | 500 | 21 | 10,500 | 15,900 |
| *Total* | *1,000* | *-* | *9,000* | *800* | *-* | *16,800* | *25,800* |

***3. Statement Showing Actual Sales for 2014-15***

| *Division* | *Product X* | *Product Y* | *Total* |
|---|---|---|---|

| | Qty. | Rate (₹) | Amount (₹) | Qty. | Rate (₹) | Amount (₹) | Amount (₹) |
|---|---|---|---|---|---|---|---|
| East | 500 | 9 | 4,500 | 200 | 21 | 4,200 | 8,700 |
| West | 700 | 9 | 6,300 | 400 | 21 | 8,400 | 14,700 |
| ***Total*** | ***1,200*** | ***-*** | ***10,800*** | ***600*** | ***-*** | ***12,600*** | ***23,400*** |

***Working notes:***

***Calculation of budgeted sales of product X for 15 -16 in units***

| | | | | |
|---|---|---|---|---|
| East division | = | (400 units + 10%) + 60 units | = | 500 units |
| West division | = | (600 units + 5%) + 70 units | = | 700 units |

***Calculation of budgeted sales of product Y for 15 -16 in units***

| | | | | |
|---|---|---|---|---|
| East division | = | (300 units + 20%) + 40 units | = | 400 units |
| West division | = | (500 units + 10%) + 50 units | = | 600 units |

### *PYQ 7*

You are given the following data of a manufacturing concern:

| | |
|---|---|
| ***Variable expenses (at 50% capacity)*** | |
| Materials | 48,00,000 |
| Labour | 51,20,000 |
| Others | 7,60,000 |
| ***Semi variable expenses (at 50% capacity)*** | |
| Maintenance and repairs | 5,00,000 |
| Indirect labour | 19,80,000 |
| Sales department salaries | 5,80,000 |
| Sundry administrative expenses | 5,20,000 |
| ***Fixed expenses*** | |
| Wages and salaries | 16,80,000 |
| Rent, rates and taxes | 11,20,000 |
| Depreciation | 14,00,000 |
| Sundry administrative expenses | 17,80,000 |

The fixed expenses remain constant for all levels of production. Semi variable expenses remain constant between 45% and 65% of capacity whereas it increases by 10% between 65% and 80% capacity of 20% between 80% and 100 % capacity.

***Sales at various levels are as under:***

| | |
|---|---|
| At 75% capacity | ₹2,40,00,000 |
| At 100% capacity | ₹3,20,00,000 |

***You are required to prepare flexible budget at 75% and 100% capacity.***

***[(8 Marks) May 2017]***

### *Answer*

***Flexible Budget***

| ***Particulars*** | ***Capacity Levels*** | | |
|---|---|---|---|
| | ***50% (₹)*** | ***75% (₹)*** | ***100% (₹)*** |
| ***(A) Sales*** | - | 2,40,00,000 | 3,20,00,000 |
| ***(B) Variable Expenses:*** | | | |
| Material | 48,00,000 | 72,00,000 | 96,00,000 |
| Labour | 51,20,000 | 76,80,000 | 1,02,40,000 |
| Others | 7,60,000 | 11,40,000 | 15,20,000 |
| ***Total (B)*** | ***1,06,80,000*** | ***1,60,20,000*** | ***2,13,60,000*** |

| | | | |
|---|---|---|---|
| **(C) Semi Variable Expenses** | | | |
| Maintenance and repairs | 5,00,000 | 5,50,000 | 6,00,000 |
| Indirect labour | 19,80,000 | 21,78,000 | 23,76,000 |
| Sales department salaries | 5,80,000 | 6,38,000 | 6,96,000 |
| Sundry administrative expenses | 5,20,000 | 5,72,000 | 6,24,000 |
| **Total (C)** | **35,80,000** | **39,38,000** | **42,96,000** |
| **(D) Fixed Cost:** | | | |
| Wages and salaries | 16,80,000 | 16,80,000 | 16,80,000 |
| Rent, rates and taxes | 11,20,000 | 11,20,000 | 11,20,000 |
| Depreciation | 14,00,000 | 14,00,000 | 14,00,000 |
| Sundry administrative expenses | 17,80,000 | 17,80,000 | 17,80,000 |
| **Total (D)** | **59,80,000** | **59,80,000** | **59,80,000** |
| **Total Cost (B + C + D)** | **2,02,40,000** | **2,59,38,000** | **3,16,36,000** |
| **Net Profit (A - D)** | **-** | **(19,38,000)** | **3,64,000** |

## PYQ 8

AB manufacturing company manufactures two products A and B. both products use a common raw materials 'C'. The raw material 'C' is purchased at the rate of ₹45 per kg. from the market. The company has made estimates for the year ended 31st March, 2018 (the budgeted period) as under:

| | Product A | Product B |
|---|---|---|
| Sales in units | 36,000 | 16,700 |
| Finished goods stock increased by year end in units | 860 | 400 |
| Post-production rejection rate (%) | 3 | 5 |
| Material 'C' per computed unit, net of wastage | 4 kg | 5 kg |
| Material 'C' wastage in % | 5 | 4 |

***Additional information available is as under:***

- Usage of raw material 'C' is expected to be at constant rate over the period.
- Annual cost of holding one unit of raw material "C" in stock is 9% of the material cost.
- The cost of placing an order is 250 per order.

***You are required to:***

***(a)*** Prepare functional budgets for the year ended 31st March, 2018 under the following categories:

***i.*** Production budget for product A and B in units.

***ii.*** Purchase budget for raw material 'C' in kg and value.

***(b)*** Calculate economic order quantity (EOQ) in kg for raw material 'C'.

***[(8 Marks) Nov 2018]***

## Answer

***(a) (i) Production Budget for the year (in Quantity)***

| Particulars (in units) | Product A | Product B |
|---|---|---|
| Sales (in units) | 36,000 | 16,700 |
| Add: Increase in Closing Stock | 860 | 400 |
| **Budgeted Production after rejection** | **36,860** | **17,100** |
| Add: Post rejection @ 3%/5% | 1,140 [(36,860÷97%) × 3%] | 900 [(36,860÷95%) × 5%] |
| **Budgeted Production before rejection** | **38,000** | **18,000** |

***(a) (ii) Raw Material Purchase 'C'***

| Particulars | Product A | Product B |
|---|---|---|
| Budgeted Production in units | 38,000 | 18,000 |
| Raw Material Consumption for one unit | 4 kg | 5 kg |
| **Materials to be Purchased net of wastage** | **1,52,000** | **90,000** |

| | | |
|---|---|---|
| Add: Wastage @ 5%/4% | 8,000<br>[(1,52,000÷95%) × 5%] | 3,750<br>[(90,000÷96%) × 4%] |
| ***Materials to be Purchased*** | ***1,60,000*** | ***93,750*** |
| ***Materials to be Purchased in kg (1,60,000 + 93,750)***<br>***Materials to be Purchased in value @ ₹45 of 2,53,750*** | | ***2,53,750***<br>***₹1,14,18,750*** |

***(b)*** Economic order quantity $= \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 2,53,750 \times 250}{45 \times 9\%}} =$ ***5,597 kgs***

### *PYQ 9*

An electronic gadget manufacture was prepared sales budget for the next few months. In this respect, following figures are available:

| ***Month*** | : | ***January*** | ***February*** | ***March*** | ***April*** | ***May*** |
|---|---|---|---|---|---|---|
| ***Sales (units)*** | : | 5,000 | 6,000 | 7,000 | 7,500 | 8,000 |

To manufacture an electronic gadget, a standard cost of ₹1,500 is incurred and it is sold through dealers at an uniform price ₹2,000 per gadget to customers. Dealers are given a discount of 15% on selling.

Apart from other materials, two units of batteries are required to manufacture a gadget. The company wants to hold stock of batteries at the end of each month to cover 30% of next month's production and to hold stock of manufactured gadget to cover 25% of the next month's sale.

3,250 units of batteries and 1,200 units of manufactured gadgets were in stock on 1st January.

***Required:***

***(1)*** Prepare production budget (in units) for the month of January, February, March and April.

***(2)*** Prepare purchase budget for batteries (in units) for the month of January, February and March and calculate profit for the quarter ending on March.

***[(10 Marks) Nov 2018]***

### *Answer*

***(a) Production Budget in Units***

| ***Particulars*** | ***January*** | ***February*** | ***March*** | ***April*** |
|---|---|---|---|---|
| Budgeted Sales (in units) | 5,000 | 6,000 | 7,000 | 7,500 |
| Add: Desired Closing Stock<br>(25% of sales of next month) | 1,500 | 1,750 | 1,875 | 2,000 |
| Less: Opening Stock | (1,200) | (1,500) | (1,750) | (1,875) |
| ***Budgeted Production (in Gadget)*** | ***5,300*** | ***6,250*** | ***7,125*** | ***7,625*** |

***(b) Raw Material Purchase Budget in Batteries***

| ***Particulars*** | ***January*** | ***February*** | ***March*** | ***April*** |
|---|---|---|---|---|
| Consumption of batteries @ unit per gadget | 10,600<br>(5,300 × 2) | 12,500<br>(6,250 × 2) | 14,250<br>(7,125 × 2) | 15,250<br>(7,625 × 2) |
| Add: Desired Closing Stock<br>(30% of consumption of next month) | 3,750 | 4,275 | 4,575 | - |
| Less: Opening Stock | (3,250) | (3,750) | (4,275) | - |
| ***Budgeted Purchase (in Batteries)*** | ***11,100*** | ***13,025*** | ***14,550*** | ***-*** |

***Statement Showing Profit***

| ***Particulars*** | ***January*** | ***February*** | ***March*** | ***Total*** |
|---|---|---|---|---|
| Number of units sold | 5,000 | 6,000 | 7,000 | 18,000 |
| Sales @ ₹2,000 per Gadget<br>Less: Discount @ 15% of sales<br>Less: Standard cost @ ₹1,500 per Gadget | 1,00,00,000<br>(15,00,000)<br>(75,00,000) | 1,20,00,000<br>(18,00,000)<br>(90,00,000) | 1,40,00,000<br>(21,00,000)<br>(1,05,00,000) | 3,60,00,000<br>(54,00,000)<br>(2,70,00,000) |
| ***Profit*** | ***10,00,000*** | ***12,00,000*** | ***14,00,000*** | ***36,00,000*** |

### *PYQ 10*

PJ Ltd manufactures hockey sticks. It sells the products at ₹500 each and makes a profit of ₹125 on each stick. The company is producing 5,000 sticks annually by using 50% of its machinery capacity.

***The cost of each stick is as under:***

| | |
|---|---|
| Direct Material | ₹150 |
| Direct Wages | ₹50 |
| Works Overheads | ₹125 (50% fixed) |
| Selling Expenses | ₹50 (25% variable) |

***The anticipation for the next year is that cost will go up as under:***

| | |
|---|---|
| Fixed Charges | 10% |
| Direct Wages | 20% |
| Direct Material | 5% |

There will not be any change in selling price. There is an additional order for 2,000 sticks in the next year.

***Calculate the lowest price that can be quoted so that the company can earn the same profit as it earned in the current year?***

***[(10 Marks) Nov 2019]***

### *Answer*

***Statement Showing Lowest Sale Price***

| Particulars | | Amount (₹) |
|---|---|---|
| Direct Material | (7,000 units × ₹150 × 105%) | 11,02,500 |
| Direct Wages | (7,000 units × ₹50 × 120%) | 4,20,000 |
| Works Overheads: | | |
| Variable | (7,000 units × ₹125 × 50%) | 4,37,500 |
| Fixed | (5,000 units × ₹125 × 50% × 110%) | 3,43,750 |
| Selling Expenses: | | |
| Variable | (7,000 units × ₹50 × 25%) | 87,500 |
| Fixed | (5,000 units × ₹50 × 75% × 110%) | 2,06,250 |
| ***Total Cost*** | | ***25,97,500*** |
| Add: Target Profit | (5,000 units × ₹125) | 6,25,000 |
| ***Total Sales Value*** | | ***32,22,500*** |
| Less: Sale Value of 5,000 units | (5,000 units × ₹500) | (25,00,000) |
| ***Sales Value of 2,000 units of additional offer*** | | ***7,22,500*** |
| ÷ Number of units | | ÷2,000 |
| ***Lowest Sale Price*** | | ***₹361.25*** |

### *PYQ 11*

G Ltd. manufacturers a single product for which market demand exist for an additional quantity. Present sales are of ₹6,00,000 utilises only 60% capacity of the plant.

***The following data are available:***

| | | |
|---|---|---|
| ***(1)*** | Selling price | ₹100 per unit |
| ***(2)*** | Variable cost | ₹30 per unit |
| ***(3)*** | Semi variable cost | ₹60,000 fixed + ₹5 per unit |
| ***(4)*** | Fixed cost | ₹1,00,000 at present level, estimated to increse by 25% at and above 80% capacity. |

***You are required to prepare a flexible budget so as to arrive at the operating profit at 60%, 80% and 100% levels.***

***[(5 Marks) Nov 2020]***

## Answer

**Flexible Budget**

| Particulars | 60% | 80% | 100% |
|---|---|---|---|
| **Sales units** | **6,000** | **8,000** | **10,000** |
| **Sales @ ₹100 per unit** | **6,00,000** | **8,00,000** | **10,00,000** |
| Variable Cost @ ₹30 per unit | 1,80,000 | 2,40,000 | 3,00,000 |
| Semi Variable Cost: | | | |
| Variable @ ₹5 per unit | 30,000 | 40,000 | 50,000 |
| Fixed | 60,000 | 60,000 | 60,000 |
| Fixed Cost | 1,00,000 | 1,25,000 | 1,25,000 |
| **Total Cost** | **3,70,000** | **4,65,000** | **5,35,000** |
| **Operating Profit (Sales – Total Cost)** | **2,30,000** | **3,35,000** | **4,65,000** |

## PYQ 12

PSV Ltd. manufactures and sells a single product and estimated the following related information for the period November, 2020 to March, 2021.

| Particulars | Nov, 2020 | Dec, 2020 | Jan, 2021 | Feb, 2021 | March, 2021 |
|---|---|---|---|---|---|
| Opening stock of Finished Goods (in units) | 7,500 | 3,000 | 9,000 | 8,000 | 6,000 |
| Sales (in units) | 30,000 | 35,000 | 38,000 | 25,000 | 40,000 |
| Selling price per unit (in ₹) | 10 | 12 | 15 | 15 | 20 |

***Additional information:***

- Closing stock of finished goods at the end of March, 2021 is 10,000 units.
- Each unit of finished output requires 2 kg of Raw Material 'A' and 3 kg of Raw Material 'B'.

***You are required to prepare the following budgets for the period November, 2020 to March, 2021 on monthly basis:***

***(1)*** Sales Budget (in ₹)
***(2)*** Production budget (in units) and
***(3)*** Raw material budget for raw material 'A' and 'B' separately (in units).

***[(10 Marks) July 2021]***

## Answer

***(1) Sales Budget (in ₹)***

| Particulars | Nov. | Dec. | Jan. | Feb. | March |
|---|---|---|---|---|---|
| Sales (in units) | 30,000 | 35,000 | 38,000 | 25,000 | 40,000 |
| Selling price per unit (in ₹) | 10 | 12 | 15 | 15 | 20 |
| **Sales Value (in ₹)** | **3,00,000** | **4,20,000** | **5,70,000** | **3,75,000** | **8,00,000** |

***(2) Production Budget (in units)***

| Particulars | Nov. | Dec. | Jan. | Feb. | March |
|---|---|---|---|---|---|
| Sales | 30,000 | 35,000 | 38,000 | 25,000 | 40,000 |
| Add: Closing Finished Goods | 3,000 | 9,000 | 8,000 | 6,000 | 10,000 |
| Less: Opening Finished Goods | (7,500) | (3,000) | (9,000) | (8,000) | (6,000) |
| **Production Budget (in units)** | **25,500** | **41,000** | **37,000** | **23,000** | **44,000** |

***(3) Raw Material 'A' Budget (in units)***

| Particulars | Nov. | Dec. | Jan. | Feb. | March |
|---|---|---|---|---|---|
| Units Produced | 25,500 | 41,000 | 37,000 | 23,000 | 44,000 |
| Raw material for 1 unit in Kg | 2 | 2 | 2 | 2 | 2 |
| **Raw Material Consumption** | **51,000** | **82,000** | **74,000** | **46,000** | **88,000** |

**Raw Material 'B' Budget (in units)**

| Particulars | Nov. | Dec. | Jan. | Feb. | March |
|---|---|---|---|---|---|
| Units Produced | 25,500 | 41,000 | 37,000 | 23,000 | 44,000 |
| Raw material for 1 unit in Kg | 3 | 3 | 3 | 3 | 3 |
| **Raw Material Consumption** | **76,500** | **1,23,000** | **1,11,000** | **69,000** | **1,32,000** |

### PYQ 13

The Accountant of KPMR Ltd. has prepared the following budget for the coming year 2022 for its two products 'AYE' and 'ZYE':

| | Product 'AYE' | Product 'ZYE' |
|---|---|---|
| Production & Sales units | 4,000 | 3,000 |
| Selling price per unit | ₹200 | ₹180 |
| Direct Material per unit | ₹80 | ₹70 |
| Direct Labour per unit | ₹40 | ₹35 |
| Variable overhead per unit | ₹20 | ₹25 |
| Fixed overhead per unit | ₹10 | ₹10 |

After reviewing the above budget, the management has called the marketing team for suggesting some measures for increasing the sales. The marketing team has suggested that by promoting the products on social media, the sales quantity of both the products can be increased by 5%. Also, the selling price per unit will go up by 10%. But this will result in increase in expenditure on variable overhead and fixed overhead by 20% and 5% respectively for both the products.

***You are required to prepare flexible budget for both the products:***

*(a)* Before promotion on social media,
*(b)* After promotion on social media.

***[(5 Marks) Dec 2021]***

### Answer

**(a) Flexible Budget before Promotion on Social Media**

| Particulars | Product 'AYE' (4,000 units) | | Product 'ZYE' (3,000 units) | |
|---|---|---|---|---|
| | Per unit | Total | Per unit | Total |
| Sales | 200.00 | 8,00,000 | 180.00 | 5,40,000 |
| Direct Materials cost | 80.00 | 3,20,000 | 70.00 | 2,10,000 |
| Direct Labour cost | 40.00 | 1,60,000 | 35.00 | 1,05,000 |
| Variable overhead | 20.00 | 80,000 | 25.00 | 75,000 |
| Fixed overhead | 10.00 | 40,000 | 10.00 | 30,000 |
| **Total cost** | **150.00** | **6,00,000** | **140.00** | **4,20,000** |
| **Profit** | **50.00** | **2,00,000** | **40.00** | **1,20,000** |

**(b) Flexible Budget After Promotion on Social Media**

| Particulars | Product 'AYE' (4,200 units) | | Product 'ZYE' (3,150 units) | |
|---|---|---|---|---|
| | Per unit | Total | Per unit | Total |
| Sales | 220.00 | 9,24,000 | 198.00 | 6,23,700 |
| Direct Materials cost | 80.00 | 3,36,000 | 70.00 | 2,20,500 |
| Direct Labour cost | 40.00 | 1,68,000 | 35.00 | 1,10,250 |
| Variable overhead | 24.00 | 1,00,800 | 30.00 | 94,500 |
| Fixed overhead (40,000 + 5%)/(30,000 + 5%) | 10.00 | 42,000 | 10.00 | 31,500 |
| **Total cost** | **154.00** | **6,46,800** | **145.00** | **4,56,750** |
| **Profit** | **66.00** | **2,77,200** | **53.00** | **1,66,950** |

### PYQ 14

SR Ltd. is a manufacturer of Garments. For the first three months of financial year 2022-23 commencing on 1st April 2022, production will be constrained by direct labour. It is estimated that only 12,000 hours of direct labour hours will be available in each month.

For market reasons, production of either of the two garments must be at least 25% of the production of the other. Estimated cost and revenue per garment are as follows:

| *Particulars* | *Shirt (₹)* | *Short (₹)* |
|---|---|---|
| Sales price | 60 | 44 |
| Raw materials: | | |
| Fabric @ 12 per meter | 24 | 12 |
| Dyes and cotton | 6 | 4 |
| Direct labour @ 8 per hour | 8 | 4 |
| Fixed overhead @ 4 per hour | 4 | 2 |
| Profit | 18 | 22 |

From the month of July 2022 direct labour will no longer be a constraint. The company expects to be able to sell 15,000 shirts and 20,000 shorts in July, 2022. There will be no opening stock at the beginning of July 2022. Sales volumes are expected to grow at 10% per month cumulatively thereafter throughout the year. Following additional information is available:

- The company intends to carry stock of finished garments sufficient to meet 40% of the next month's sale from July 2022 onwards.
- The estimated selling price will be same as above.

***Required:***

***(1)*** Calculate the number of shirts and shorts to be produced per month in the first quarter of financial year 2022-2023 to maximize company's profit.

***(2)*** Prepare the following budgets on a monthly basis for July, August and September 2022:

***(a)*** Sales budget showing sales units and sales revenue for each product.

***(b)*** Production budget (in units) for each product.

***[(10 Marks) May 2022]***

## *Answer*

### *(1) Calculation of the number of shirts and shorts to be produced per month:*

***(a) Contribution per labour hour:***

| *Particulars* | *Shirt (₹)* | *Short (₹)* |
|---|---|---|
| Sales price per unit | 60 | 44 |
| Less: Variable cost per unit: | | |
| Raw materials (24 + 6) & (12 + 4) | 30 | 16 |
| Direct labour | 8 | 4 |
| Contribution per unit | ***22*** | ***24*** |
| ÷ Labour hour per unit (8 ÷ 8) & (4 ÷ 8) | ÷1 | ÷0.5 |
| ***Contribution per labour hour*** | ***22*** | ***48*** |

***(b) Production plan for the first three months:***

Since, Shorts has the higher Contribution per labour hour, it will be made first. Shirts will be 25% of Shorts.

Let the Quantity of Shorts be X and Shirts will be 0.25 X, then

| | | | | |
|---|---|---|---|---|
| (Qty. of Shorts × labour hour p.u.) + (Qty. of Shirts × labour hour p.u.) | = | | | Total labour hours |
| (X × 0.5 hour) + (0.25X × 1 hour) | = | 12,000 hours | | |
| 0.5X + 0.25X | = | 12,000 | | |
| X | = | 12,000 ÷ 0.75 | = | 16,000 units of Shorts |
| Therefore, for Shirts | = | 25% of 16,000 units | = | 4,000 units |

***Production per month for the first quarter will be Shorts 16,000 units & Shirts 4,000 units.***

***(2) (a) Sales Budget for the month of July, August & September 2022***

| *Particulars* | *July 2022* | *August 2022* | *September 2022* |
|---|---|---|---|

| | Shirts | Shorts | Shirts | Shorts | Shirts | Shorts |
|---|---|---|---|---|---|---|
| Sales demand (units) | 15,000 | 20,000 | 16,500 | 22,000 | 18,150 | 24,200 |
| Selling price per unit | 60 | 44 | 60 | 44 | 60 | 44 |
| **Sales Revenue (₹)** | **9,00,000** | **8,80,000** | **9,90,000** | **9,68,000** | **10,89,000** | **10,64,800** |

### (2) (b) Production budget for the month of July, August & September 2022

| Particulars | July 2022 | | August 2022 | | September 2022 | |
|---|---|---|---|---|---|---|
| | Shirts | Shorts | Shirts | Shorts | Shirts | Shorts |
| Sales demand (units) | 15,000 | 20,000 | 16,500 | 22,000 | 18,150 | 24,200 |
| Add: Closing stock (40% of next month) | 6,600 | 8,800 | 7,260 | 9,680 | 7,986 | 10,648 |
| Less: Opening stock | - | - | (6,600) | (8,800) | (7,260) | (9,680) |
| **Production (units)** | **21,600** | **28,800** | **17,160** | **22,880** | **18,876** | **25,168** |

**Working Note: Sales demand for October 2022:**

| | | | | |
|---|---|---|---|---|
| Shirts | = | 18,150 + 10% | = | 19,965 |
| Shorts | = | 24,200 + 10% | = | 26,620 |

## PYQ 15

A Limited has furnished the following information for the months from 1st January to 30th April, 2023:

| | January | February | March | April |
|---|---|---|---|---|
| Number of Working days | 25 | 24 | 26 | 25 |
| Production (in units) per Working day | 50 | 55 | 60 | 52 |
| Raw Material Purchases (% by weight to total of 4 months) | 21% | 26% | 30% | 23% |
| Purchase price of raw material (per kg) | ₹10 | ₹12 | ₹13 | ₹11 |

Quantity of raw material per unit of product : 4 kg.
Opening stock of raw material on 1st January : 6,020 kg. (Cost ₹63, 210)
Closing stock of raw material on 30th April : 5,100 kg.
All the purchases of material are made at the start of each month.

**Required:**

**(a)** Calculate the consumption of raw materials (in kgs) month-by-month and in total.
**(b)** Calculate the month-wise quantity and value of raw materials purchased.
**(c)** Prepare the priced stores ledger for each month using the FIFO method.

**[(10 Marks) May 2023]**

## Answer

### (a) Raw Material Consumption Budget in Kgs

| Particulars | January | February | March | April | Total |
|---|---|---|---|---|---|
| No. of working days | 25 | 24 | 26 | 25 | - |
| Production in units per day | 50 | 55 | 60 | 52 | - |
| Monthly production in units | 1,250 | 1,320 | 1,560 | 1,300 | 5,430 |
| **Raw Material Consumption @ 4 kg p.u.** | **5,000** | **5,280** | **6,240** | **5,200** | **21,720** |

### (b) Raw Material Purchase Budget in Quantity and Value

| Particulars | January | February | March | April |
|---|---|---|---|---|
| Raw Material Purchases (%) | 21% | 26% | 30% | 23% |
| Purchase in kgs (20,800 kgs × % of purchase) | 4,368 kgs | 5,408 Kgs | 6,240 kgs | 4,784 kgs |
| Purchase price per kg | ₹10 | ₹12 | ₹13 | ₹11 |
| **Purchase in Value** | **₹43,680** | **₹64,896** | **₹81,120** | **₹52,624** |

**Working note:**

Total Purchase of Raw Material (January to April) = Consumption + Closing Stock –Opening Stock

= 21,720 + 5,100 – 6,020
= 20,800 Kgs.

### (c) Stores Ledger (FIFO Method)

| Months | Receipts | | | Issues | | | Balance | | |
|---|---|---|---|---|---|---|---|---|---|
| | Kgs | Rate | Value | Kgs | Rate | Value | Kgs | Rate | Value |
| Opening | | | | | | | 6,020 | 10.5 | 63,210 |
| January | 4,368 | 10 | 43,680 | 5,000 | 10.5 | 52,500 | 1,020<br>4,368 | 10.5<br>10 | 10,710<br>43,680 |
| February | 5,408 | 12 | 64,896 | 1,020<br>4,260 | 10.5<br>10 | 10,720<br>42,600 | 108<br>5,408 | 10<br>12 | 1,080<br>64,896 |
| March | 6,240 | 13 | 81,120 | 108<br>5,408<br>724 | 10<br>12<br>13 | 1,080<br>64,896<br>9,412 | 5,516 | 13 | 71,708 |
| April | 4,784 | 11 | 52,624 | 5,200 | 13 | 67,600 | 316<br>4,784 | 13<br>11 | 4,108<br>52,624 |

### PYQ 16

PQR Limited manufactures three products – X, Product Y and Product Z. The output for the current year is 2,50,000 units of Product X, 2,80,000 units of Product Y and 3,20,000 units of Product Z respectively.

Selling price of Product X is 1.25 times of Product Z whereas Product Y can be sold at double the price at which product Z can be sold. Product Z can be sold at a profit of 20% on its marginal cost.

***Other information are as follows:***

| | Product X | Product Y | Product Z |
|---|---|---|---|
| Direct Materials Cost (per unit) | ₹20 | ₹20 | ₹20 |
| Direct Wages Cost (per unit) | ₹16 | ₹24 | ₹16 |

Raw materials used for manufacturing all the three products is the same. Direct Wages are paid @ ₹4 per labour hour. Total overhead cost of the company is ₹52,80,000 for the year, out of which ₹1 per labour is variable and the rest is fixed.

In the next year it is expected that sales of product X and product Z will increase by 12% and 15% respectively and sale of product Y will decline by 5%. The total overhead cost of the company for the next year is estimated at ₹55,08,000. The variable cost of ₹1 per labour hour remains unchanged. It is anticipated that all other costs will remain same for the next year and there is no opening and closing stock. Selling Price per unit of each product will remain unchanged in the next year.

***Prepare a budget showing the current position and the position for the next year clearly indicating the total product-wise contribution and profit for the company as a whole.***

***[(10 Marks) May 2023]***

### Answer

#### (1) Statement Showing Product-wise Contribution and Profit for the Company (Current Position)

| Particulars | Product X | Product Y | Product Z | Total |
|---|---|---|---|---|
| Sales (Units) | 2,50,000 | 2,80,000 | 3,20,000 | 8,50,000 |
| Sales value @ ₹60, ₹96 and ₹48 per unit | ***1,50,00,000*** | ***2,68,80,000*** | ***1,53,60,000*** | ***5,72,40,000*** |
| Direct materials @ ₹20 per unit | 50,00,000 | 56,00,000 | 64,00,000 | 1,70,00,000 |
| Direct wages @ ₹16, ₹24 and ₹16 per unit | 40,00,000 | 67,20,000 | 51,20,000 | 1,58,40,000 |
| Variable overheads @ ₹1 per hour | 10,00,000 | 16,80,000 | 12,80,000 | 39,60,000 |
| Marginal cost | 1,00,00,000 | 1,40,00,000 | 1,28,00,000 | 3,68,00,000 |
| ***Contribution*** | ***50,00,000*** | ***1,28,80,000*** | ***25,60,000*** | ***2,04,40,000*** |
| Less: Fixed overheads | | | | 13,20,000 |
| ***Profit*** | | | | ***1,91,20,000*** |

***(2) Statement Showing Product-wise Contribution and Profit for the Company (Next Year)***

| Particulars | Product X | Product Y | Product Z | Total |
|---|---|---|---|---|
| Sales (Units) | 2,80,000 | 2,66,000 | 3,68,000 | 9,14,000 |
| Sales value @ ₹60, ₹96 and ₹48 per unit | ***1,68,00,000*** | ***2,55,36,000*** | ***1,76,64,000*** | ***6,00,00,000*** |
| Direct materials @ ₹20 per unit | 56,00,000 | 53,20,000 | 73,60,000 | 1,82,80,000 |
| Direct wages @ ₹16, ₹24 and ₹16 per unit | 44,80,000 | 63,84,000 | 58,88,000 | 1,67,52,000 |
| Variable overheads @ ₹1 per hour | 11,20,000 | 15,96,000 | 14,72,000 | 41,88,000 |
| Marginal cost | 1,12,00,000 | 1,33,00,000 | 1,47,20,000 | 3,92,20,000 |
| ***Contribution*** | ***56,00,000*** | ***1,22,36,000*** | ***29,44,000*** | ***2,07,80,000*** |
| Less: Fixed overheads | | | | 13,20,000 |
| ***Profit*** | | | | ***1,94,60,000*** |

***Working note:***

***(a)*** Labour hours (Current) = 2,50,000 units × 16/4 + 2,80,000 units × 24/4 + 3,20,000 units × 16/4
= 10,00,000 hours + 16,80,000 hours + 12,80,000 hours
= 39,60,000 hours

***(b)*** Fixed OH (Current) = Total OH – Variable OH
= ₹52,80,000 – 39,60,000 hours × ₹1 = ₹13,20,000

***(c)*** Sale price of Product Z = Marginal cost p.u. + 20%
= (₹20 + ₹16 + 4 hours × ₹1) + 20% = ₹48 per unit

***(d)*** Sale price of Product X = 1.25 times of ₹48 = ₹60 per unit

***(e)*** Sale price of Product Y = 2 times of ₹48 = ₹96 per unit

***(f)*** Labour hours (Next year) = 2,80,000 units × 4H + 2,66,000 units × 6H + 3,68,000 units × 4H
= 11,20,000 hours + 15,96,000 hours + 14,72,000 hours
= 41,88,000 hours

***(g)*** Fixed OH (Next year) = Total OH – Variable OH
= ₹55,08,000 – 41,88,000 hours × ₹1 = ₹13,20,000

# SUGGESTED REVISION

| Ques. No. | Observations or KEY Points (Note down during revisions) | Page No. of Practical Register | 1st & 2nd Revision | 3rd, 4th & 5th Revision | Revision during Exams |
|---|---|---|---|---|---|
| BQ (Book Questions covering Study Module of ICAI, PM, RTP's, MTP's and Important Questions) | | | | | |
| 1 | | | Y | - | - |
| 2 | | | Y | Y | - |
| 3 | | | Y | Y | - |
| 4 | | | Y | Y | - |
| 5 | | | Y | Y | - |
| 6 | | | Y | Y | Y |
| 7 | | | Y | Y | Y |
| 8 | | | Y | Y | Y |
| 9 | | | Y | - | - |
| 10 | | | Y | Y | Y |
| 11 | | | Y | Y | Y |
| 12 | | | Y | Y | Y |
| 13 | | | Y | Y | Y |
| 14 | | | Y | Y | - |
| 15 | | | Y | Y | - |
| 16 | | | Y | Y | Y |
| 17 | | | Y | Y | Y |
| 18 | | | Y | - | - |
| 19 | | | Y | Y | - |
| 20 | | | Y | Y | Y |
| 21 | | | Y | Y | Y |
| 22 | | | Y | Y | Y |
| 23 | | | Y | Y | Y |
| PYQ (Past Year Questions) | | | | | |
| 1 | | | Y | Y | Y |
| 2 | | | Y | Y | - |
| 3 | | | Y | - | - |
| 4 | | | Y | Y | - |
| 5 | | | Y | Y | - |
| 6 | | | Y | Y | - |
| 7 | | | Y | Y | - |
| 8 | | | Y | Y | Y |
| 9 | | | Y | Y | Y |
| 10 | | | Y | Y | Y |
| 11 | | | Y | - | - |
| 12 | | | Y | Y | Y |
| 13 | | | Y | Y | - |
| 14 | | | Y | Y | Y |
| 15 | | | Y | Y | - |
| 16 | | | Y | Y | Y |

# CHAPTER - 12

# STANDARD COSTING

## LEARNING OBJECTIVES

*After studying this chapter you should be able to:*

- *Understand the meaning of standard cost and variances.*
- *Understand the difference between controllable and uncontrollable variances.*
- *Compute variances related to material, labour & overheads.*
- *Understand the advantages and disadvantages of standard costing and variance analysis.*

# MATERIAL COST VARIANCE

## BQ 1

The standard and actual figures of product 'Z' are as under:

| | Standard | Actual |
|---|---|---|
| Material quantity | 50 units | 45 units |
| Material price per unit | ₹1.00 | ₹0.80 |

***Calculate material cost variance.***

### Answer

| | | | | | |
|---|---|---|---|---|---|
| *(i)* | Material Price Variance | = | Actual Quantity (Standard Price – Actual Price) | | |
| | | = | 45 units (₹1.00 - ₹0.80) | = | ***₹9 F*** |
| *(ii)* | Material Usage Variance | = | Standard Price (Standard Quantity – Actual Quantity) | | |
| | | = | ₹1.00 (50 units - 45 units) | = | ***₹5 F*** |
| *(iii)* | Material Cost Variance | = | Standard cost – Actual cost | | |
| | | = | ₹50 - ₹36 | = | ***₹14 F*** |
| *(a)* | Standard cost | = | Standard Quantity × Standard Price | | |
| | | = | 50 units × ₹1.00 | = | ***₹50.00*** |
| *(b)* | Actual cost | = | Actual Quantity × Actual Price | | |
| | | = | 45 units × ₹0.80 | = | ***₹36.00*** |

## BQ 2

NXE Manufacturing Concern furnishes the following information:

| | | |
|---|---|---|
| ***Standard:*** | Material for 70 kg finished products | 100 kg. |
| | Price of material | ₹1 per kg. |
| ***Actual:*** | Output | 2,10,000 kg. |
| | Material used | 2,80,000 kg. |
| | Cost of Materials | ₹2,52,000 |

***Calculate:***

*(a)* Material usage variance,
*(b)* Material price variance,
*(c)* Material cost variance.

### Answer

| | | | | | |
|---|---|---|---|---|---|
| *(a)* | Material Usage Variance | = | SP × (SQ – AQ) | | |
| | | = | ₹1.00 × (3,00,000 – 2,80,000) | = | ***₹20,000 F*** |
| *(b)* | Material Price Variance | = | AQ × (SP – AP) | | |
| | | = | 2,80,000 × (₹1.00 - ₹0.90) | = | ***₹28,000 F*** |
| *(c)* | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | | = | (3,00,000×1) – (2,80,000×0.90) | = | ***₹48,000 F*** |

***Working notes:***

| | | | | | |
|---|---|---|---|---|---|
| **1.** | SQ of input for actual output | = | 2,10,000 kg × $\frac{100 \text{ kgs}}{70 \text{ kgs}}$ | = | 3,00,000 kgs |
| **2.** | Actual Price (AP) | = | ₹2,52,000 ÷ 2,80,000 kg | = | ₹0.90 per kg. |

## BQ 3

The standard cost of a chemical mixture is as follows:

| | |
|---|---|
| 40% material A | at ₹20 per kg. |
| 60% material B | at ₹30 per kg. |

A standard loss of 10% of input is expected in production. The cost records for a period showed the following usage:

| | |
|---|---|
| 90 kg material A | at a cost of ₹18 per kg. |
| 110 kg material B | at a cost of ₹34 per kg. |

The quantity produced was 182 kg. of good product.

***Calculate (1) Material Price Variance, (2) Material Usage variance and (3) Material Cost variance.***

### *Answer*

| | | | | | |
|---|---|---|---|---|---|
| ***1.*** | Material Price Variance | = | (AQ × SP) – (AQ × AP) | | |
| | | = | ₹5,100 - ₹5,360 | = | ***₹260 A*** |
| ***2.*** | Material Usage Variance | = | (SQ × SP) – (AQ × SP) | | |
| | | = | ₹5,257.78 – ₹5,100 | = | ***₹157.78 F*** |
| ***3.*** | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | | = | ₹5,257.78 – ₹5,360 | = | ***₹102.22 A*** |

***Working notes:***

***(a) Analysis Table***

| Materials | SQ × SP | AQ × SP | AQ × AP |
|---|---|---|---|
| A<br>B | 80.88 kg × ₹20<br>121.33 kg × ₹30 | 90 kg × ₹20<br>110 kg × ₹30 | 90 kg × ₹18<br>110 kg × ₹34 |
| Total | ₹5,257.78 | ₹5,100 | ₹5,360 |

| | | | | | |
|---|---|---|---|---|---|
| ***(b)*** | SQ of input for actual output | = | 182 kg ÷ 90% | = | 202.22 kgs |
| | Materials A | = | 202.22 kgs × 40% | = | 80.88 kgs |
| | Materials B | = | 202.22 kgs × 60% | = | 121.33 kgs |

### *BQ 4*

For making 10 kg. of CEMCO, the standard material requirements is:

| Materials | Quantity (kg) | Rate per kg. (₹) |
|---|---|---|
| A | 8 | 6.00 |
| B | 4 | 4.00 |

During April, 1,000 kg of CEMCO were produced. The actual consumption of materials is as under:

| Materials | Quantity (kg) | Rate per kg. (₹) |
|---|---|---|
| A | 750 | 7.00 |
| B | 500 | 5.00 |

***Calculate:***

***(a)*** Material Cost Variance;
***(b)*** Material Price Variance;
***(c)*** Material Usage Variance.

### *Answer*

| | | | | | |
|---|---|---|---|---|---|
| ***(a)*** | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | | = | ₹6,400 – ₹7,750 | = | ***₹1,350 A*** |
| ***(b)*** | Material Price Variance | = | (AQ × SP) – (AQ × AP) | | |
| | | = | ₹6,500 - ₹7,750 | = | ***₹1,250 A*** |
| ***(c)*** | Material Usage Variance | = | (SQ × SP) – (AQ × SP) | | |
| | | = | ₹6,400 – ₹6,500 | = | ***₹100 A*** |

***Working notes:***

***1. Basic calculation***

| Materials | SQ × SP | AQ × SP | AQ × AP |
|---|---|---|---|
| A<br>B | 800 kg × ₹6<br>400 kg × ₹4 | 750 kg × ₹6<br>500 kg × ₹4 | 750 kg × ₹7<br>500 kg × ₹5 |
| Total | ₹6,400 | ₹6,500 | ₹7,750 |

***2.*** SQ of input for actual output:

| | | | | |
|---|---|---|---|---|
| Materials A | = | (8 kg ÷ 10 kg) × 1,000 kg | = | 800 kgs |
| Materials B | = | (4 kg ÷ 10 kg) × 1,000 kg | = | 400 kgs |

## ***BQ 5***

The Standard mix to produce one unit of product is as follows:

| | | | |
|---|---|---|---|
| Material X | 60 | units @ ₹15 per unit | ₹900 |
| Material Y | 80 | units @ ₹20 per unit | ₹1,600 |
| Material Z | 100 | units @ ₹25 per unit | ₹2,500 |
| | ***240*** | | ***₹5,000*** |

During the month of April, 10 units were actually produced and consumption was as follows:

| | | | |
|---|---|---|---|
| Material X | 640 | units @ ₹17.50 per unit | ₹11,200 |
| Material Y | 950 | units @ ₹18.00 per unit | ₹17,100 |
| Material Z | 870 | units @ ₹27.50 per unit | ₹23,925 |
| | ***2,460*** | | ***₹52,225*** |

***Calculate all material variances.***

## ***Answer***

| | | | | | |
|---|---|---|---|---|---|
| ***1.*** | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | | = | ₹50,000 – ₹52,225 | = | ***₹2,225 A*** |
| ***2.*** | Material Price Variance | = | (AQ × SP) – (AQ × AP) | | |
| | | = | ₹50,350 - ₹52,225 | = | ***₹1,875 A*** |
| ***3.*** | Material Usage Variance | = | (SQ × SP) – (AQ × SP) | | |
| | | = | ₹50,000 – ₹50,350 | = | ***₹350 A*** |
| ***4.*** | Material Mix Variance | = | (RSQ × SP) – (AQ × SP) | | |
| | | = | ₹51,250 – ₹50,350 | = | ***₹900 F*** |
| ***5.*** | Material Yield Variance | = | (SQ × SP) – (RSQ × SP) | | |
| | | = | ₹50,000 – ₹51,250 | = | ***₹1,250 A*** |

***Working notes:***

***a. Basic Calculation***

| Materials | SQ × SP | RSQ × SP | AQ × SP | AQ × AP |
|---|---|---|---|---|
| X<br>Y<br>Z | 600 × ₹15.00<br>800 × ₹20.00<br>1,000 × ₹25.00 | 615 × ₹15.00<br>820 × ₹20.00<br>1,025 × ₹25.00 | 640 × ₹15.00<br>950 × ₹20.00<br>870 × ₹25.00 | 640 × ₹17.50<br>950 × ₹18.00<br>870 × ₹27.50 |
| Total | ₹50,000 | ₹51,250 | ₹50,350 | ₹52,225 |

***b.*** SQ of input for actual output:

| | | | | |
|---|---|---|---|---|
| Materials X | = | 60 units × 10 units of FG | = | 600 units |
| Materials Y | = | 80 units × 10 units of FG | = | 800 units |
| Materials Z | = | 100 units × 10 units of FG | = | 1,000 units |

***c.*** RSQ (Revised Standard Quantity)of actual input:

| | | | | |
|---|---|---|---|---|
| Materials X | = | 2,460 units × 60/240 | = | 615 units |
| Materials Y | = | 2,460 units × 80/240 | = | 820 units |
| Materials Z | = | 2,460 units × 100/240 | = | 1,025 units |

### *BQ 6*

One standard mix of product A2 is as follow:

| *Kg* | *Material* | *Price per Kg (₹)* |
|---|---|---|
| 45 | X | 6.00 |
| 25 | Y | 4.50 |
| 30 | Z | 9.50 |

The standard loss in production is 10% of input. There is no scrap value. Actual production for a month was 7,425 Kg of A2 from 80 mixes. Actual purchases and consumption of material during the month were:

| *Kg* | *Material* | *Price per Kg (₹)* |
|---|---|---|
| 4,200 | X | 6.50 |
| 1,700 | Y | 4.25 |
| 2,600 | Z | 9.75 |

***You are required to calculate the following variances for presentation to the management:***

***(i)*** Material Cost Variance; ***(ii)*** Material Price Variance; ***(iii)*** Material Usage Variance; ***(iv)*** Material Mix Variance and ***(v)*** Material Yield Variance.

***[(i) 4,806 A (ii) 2,325 A (iii) 2,481 A (iv) 812 A (v) 1,669 A]***

### *BQ 7*

AB Ltd. has established the following standard mix for producing 9 gallons of product A.

| | | |
|---|---|---|
| 5 gallons of material X at ₹7 per gallon | = | ₹35.00 |
| 3 gallons of material Y at ₹5 per gallon | = | ₹15.00 |
| 2 gallons of material Z at ₹2 per gallon | = | ₹4.00 |

A standard loss of 10% of input is expected to occur.

***Actual input was as under:***

| | | |
|---|---|---|
| 53,000 gallons of material X at ₹7 per gallon | = | ₹3,71,000 |
| 28,000 gallons of material Y at ₹5.30 per gallon | = | ₹1,48,400 |
| 19,000 gallons of material Z at ₹2.20 per gallon | = | ₹41,800 |

Actual output for a period was 92,700 gallons of product A.

***Compute (i)*** Material Mix Variance; ***(ii)*** Material Yield Variance, ***(iii)*** Material Price Variance

***[(i) 9,000 A (ii) 16,200 F (iii) 12,200 A]***

### *BQ 8*

A company manufactures a particular product the standard direct materials cost of which is ₹10 per unit. The following is obtained from the costing records:

***(a) Standard:***

| *Material* | *Quantity* | *Rate* | *Amount* |
|---|---|---|---|
| A | 70 | 10.00 | 700.00 |
| B | 30 | 5.00 | 150.00 |
| | ***100*** | | ***850.00*** |
| Loss: (15%) | 15 | | NIL |
| | ***85*** | | ***850.00*** |

***(b) Actual result:***

| *Material* | *Quantity* | *Rate* | *Amount* |
|---|---|---|---|
| A | 400 | 11.00 | 4,400.00 |
| B | 200 | 6.00 | 1,200.00 |
| | ***600*** | | ***5,600.00*** |
| Loss: | 60 | | NIL |
| | ***540*** | | ***5,600.00*** |

***Compute:***

- ***(i)*** Material Price Variance;
- ***(ii)*** Material Mix Variance;
- ***(iii)*** Material Yield Variance;
- ***(iv)*** Material Usage Variance; and
- ***(v)*** Total Material Cost Variance.

***[(i) 600 A (ii) 100 F (iii) 300 F (iv) 400 F (v) 200 A]***

### BQ 9

A factory manufactures a chemical product with three ingredient chemicals A, B and C as per standard data given below:

| *Chemical* | *% of total input* | *Standard cost per kg* |
|---|---|---|
| A | 50% | ₹40.00 |
| B | 30% | ₹60.00 |
| C | 20% | ₹95.00 |

There is a process loss of 5% during the course of manufacture. The Management gives the following details for a certain week:

| *Chemical* | *Quantity consumed* | *Actual cost incurred* |
|---|---|---|
| A | 5,200 kg | ₹2,34,000 |
| B | 3,600 kg | ₹2,19,600 |
| C | 1,700 kg | ₹1,58,100 |

Actual output of finished product 10,200 kg and Budgeted output 12,000 kg.

***Calculate all the relevant variances.***

***[MPV 26,200 A, MMV 13,000 F, MYV 13,500 F, MUV 26,500 F, MCV 300 F]***

### BQ 10

The standard cost of a chemical mixture is as follows:

60% of Material A @ ₹50 per kg
40% of Material B @ ₹60 per kg

A standard loss of 25% on output is expected in production. The cost records for a period has shown the following usage:

540 kg of Material A @ ₹60 per kg
260 kg of Material B @ ₹50 per kg

The quantity processed was 680 kilograms of good product.

***From the above given information calculate:***

***(1)*** Material Cost Variance
***(2)*** Material Price Variance
***(3)*** Material Usage Variance
***(4)*** Material Mix Variance
***(5)*** Material Yield Variance

### Answer

| | | | | | |
|---|---|---|---|---|---|
| ***(1)*** | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | | = | ₹45,900 – ₹45,400 | = | ***₹500 F*** |
| ***(2)*** | Material Price Variance | = | (AQ × SP) – (AQ × AP) | | |
| | | = | ₹42,600 - ₹45,400 | = | ***₹2,800 A*** |
| ***(3)*** | Material Usage Variance | = | (SQ × SP) – (AQ × SP) | | |
| | | = | ₹45,900 – ₹42,600 | = | ***₹3,300 F*** |
| ***(4)*** | Material Mix Variance | = | (RSQ × SP) – (AQ × SP) | | |
| | | = | ₹43,200 – ₹42,600 | = | ***₹600 F*** |

**(5)** Material Yield Variance = (SQ × SP) – (RSQ × SP)
= ₹45,900 – ₹43,200 = **₹2,700 F**

**Working notes:**

**(a) Basic Calculation**

| Materials | SQ × SP | RSQ × SP | AQ × SP | AQ × AP |
|---|---|---|---|---|
| A | 510 × ₹50 | 480 × ₹50 | 540 × ₹50 | 540 × ₹60 |
| B | 340 × ₹60 | 320 × ₹60 | 260 × ₹60 | 260 × ₹50 |
| Total | ₹45,900 | ₹43,200 | ₹42,600 | ₹45,400 |

**(b)** SQ of input for actual output:

Input – Loss = Output
Input – 25% Output = Output
Input = 125% Output
Input of Raw Material = 125% × 680 kgs of Good Product = 850 kgs

Materials A = 850 kgs × 60% = 510 kgs
Materials B = 850 kgs × 40% = 340 kgs

**(c)** RSQ (Revised Standard Quantity)of actual input:

Materials A = 800 kgs × 60% = 480 kgs
Materials B = 800 kgs × 40% = 320 kgs

## BQ 11

Modern Tiles Limited makes plastic tiles of standard size of 6" × 6" with ⅛" thickness. From the following information:

***You are required to calculate for direct materials:***

**(i)** The cost variance in total;
**(ii)** The cost variance sub-divided into Price and Usage;
**(iii)** The usage variance analyzed to show Mixture, and Yield.

A standard mix of the compound required to produce an output of 20,000 square feet of tiles with ⅛" thickness is as following:

| Direct Materials | Quantity (Kg) | Price Per Kg (₹) |
|---|---|---|
| A | 600 | 0.90 |
| B | 400 | 0.65 |
| C | 500 | 0.40 |

During December 2022, 8 mixes were processed and actual materials consumed were:

| Direct Materials | Quantity (Kg) | Price Per Kg (₹) |
|---|---|---|
| A | 5,000 | 0.85 |
| B | 2,900 | 0.60 |
| C | 4,400 | 0.45 |

Actual production for December was 6,20,000 tiles.

***[(i) 220 A (ii) (a) 175 F (b) 395 A (iii) (a) 55 F (b) 450 A]***

## BQ 12

Vinayak Ltd. produces an article by blending two basic raw materials. It operates a standard costing system and the following standards have been set for raw materials:

| Materials | Mix | Standard price per kg |
|---|---|---|
| A | 40% | ₹4.00 |
| B | 60% | ₹3.00 |

The standard loss in processing is 15%. During April, 2023, the company produced 1,700 kg of finished output and the position of stock and purchased for the month of April, 2023 is as under:

| Material | Stock on 01.04.23 | Stock on 30.04.23 | Purchased during April' 23 | |
|---|---|---|---|---|
| | | | kg | Cost (₹) |
| A | 35 kgs | 5 kgs | 800 | 3,400 |
| B | 40 kgs | 50 kgs | 1,200 | 3,000 |

***Calculate material variances (Price variance on the basis of consumption).***

***[MPV 376.25 F, MMV 22 A, MYV 68 A, MUV 90 A, MCV 286.25 F]***

## BQ 13

J.K. Ltd. manufactures NXE by mixing three raw materials. For every batch of 100 kg. of NXE, 125 kg. of raw materials are used. In April, 60 batches were prepared to produce an output of 5,600 kg. of NXE. The standard and actual particulars for April, are as follows:

| Materials | Standard | | Actual | | Materials Purchased |
|---|---|---|---|---|---|
| | Mix | Price per kg | Mix | Price per kg | |
| | % | (₹) | % | (₹) | (kg) |
| A | 50 | 20 | 60 | 21 | 5,000 |
| B | 30 | 10 | 20 | 8 | 2,000 |
| C | 20 | 5 | 20 | 6 | 1,200 |

***Calculate all variances.***

### Answer

**1.** Material Price Variance = (AQP × SP) – (AQP × AP)
(Based on purchase) = ₹1,26,000 - ₹1,28,200 = ***₹2,200 A***

***Or***

Material Price Variance = (AQ used × SP) – (AQ used × AP)
(Based on consumption) = ₹1,12,500 - ₹1,15,500 = ***₹3,000 A***

**2.** Material Mix Variance = (RSQ × SP) – (AQ × SP)
= ₹1,05,000 – ₹1,12,500 = ***₹7,500 A***

**3.** Material Yield Variance = (SQ × SP) – (RSQ × SP)
= ₹98,000 – ₹1,05,000 = ***₹7,000 A***

**4.** Material Usage Variance = (SQ × SP) – (AQ × SP)
= ₹98,000 – ₹1,12,500 = ***₹14,500 A***

**5.** Material Cost Variance = MUV + MPV
(based on purchase) = ₹14,500 A + ₹2,200 A = ***₹16,700 A***

***Or***

Material Cost Variance = (SQ × SP) – (AQ × AP)
(based on consumption) = ₹98,000 – ₹1,15,500 = ***₹17,500 A***

### Working notes:

***a. Basic calculation***

| Materials | SQ × SP | RSQ × SP | AQC × SP | AQC × AP | AQP × SP | AQP × AP |
|---|---|---|---|---|---|---|
| A | 3,500 × ₹20 | 3,750 × ₹20 | 4,500 × ₹20 | 4,500 × ₹21 | 5,000 × ₹20 | 5,000 × ₹21 |
| B | 2,100 × ₹10 | 2,250 × ₹10 | 1,500 × ₹10 | 1,500 × ₹8 | 2,000 × ₹10 | 2,000 × ₹8 |
| C | 1,400 × ₹5 | 1,500 × ₹5 | 1,500 × ₹5 | 1,500 × ₹6 | 1,200 × ₹5 | 1,200 × ₹6 |
| Total | ₹98,000 | ₹1,05,000 | ₹1,12,500 | ₹1,15,500 | ₹1,26,000 | ₹1,28,200 |

**b.** Actual quantity of materials used = 125 kg × 60 batches = 7,500 kgs.
Materials A = 7,500 kgs. × 60% = 4,500 kgs.

| | | | | |
|---|---|---|---|---|
| Materials B | = | 7,500 kgs. × 20% | = | 1,500 kgs. |
| Materials C | = | 7,500 kgs. × 20% | = | 1,500 kgs. |

**c.** RSQ (Revised Standard Quantity) of actual input:

| | | | | |
|---|---|---|---|---|
| Materials A | = | 7,500 kgs. × 50% | = | 3,750 kgs. |
| Materials B | = | 7,500 kgs. × 30% | = | 2,250 kgs. |
| Materials C | = | 7,500 kgs. × 20% | = | 1,500 kgs. |

**d.** SQ of input for actual output = 5,600 kgs × 125 kg/100 kg = 7,000 kgs.

| | | | | |
|---|---|---|---|---|
| Materials A | = | 7,000 kgs. × 50% | = | 3,500 kgs. |
| Materials B | = | 7,000 kgs. × 30% | = | 2,100 kgs. |
| Materials C | = | 7,000 kgs. × 20% | = | 1,400 kgs. |

### BQ 14

GAP Limited operates a system of standard costing in respect of one of its products which is manufactured within a single cost centre. Following are the details:

***Budgeted data:***

| Material | Quantity | Price | Amount (₹) |
|---|---|---|---|
| A | 60 | 20 | 1,200 |
| B | 40 | 30 | 1,200 |
| | ***100*** | | ***2,400*** |
| Normal Loss: | 20 | | - |
| ***Output*** | ***80*** | | ***2,400*** |

***Actual data:***

| Material | Quantity | Price | Amount (₹) |
|---|---|---|---|
| A | 70 | ? | ? |
| B | ? | 30 | ? |

| | |
|---|---|
| Material Price Variance (A) | ₹105A |
| Material Cost Variance | ₹275A |

***You are required to calculate:***

1. Actual Price of material A
2. Actual Quantity of material B
3. Material Price Variance
4. Material Usage Variance
5. Material Mix Variance
6. Material Sub Usage (Yield) Variance

### Answer

**1. *Actual Price of Material A:***

| | | | | |
|---|---|---|---|---|
| Material Price Variance (A) | = | AQ × (SP - AP) | = | 70 × (₹20 - AP) |
| ₹105A | = | 1,400 – 70 AP | | |
| 70 AP | = | ₹1,505 | | |
| AP | = | ₹1,505 ÷ 70 | = | ***₹21.50*** |

**2. *Actual Quantity of Material B:***

| | | | | |
|---|---|---|---|---|
| Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| ₹275A | = | {(60 × 20) + (40 × 30)} – {(70 × 21.5) + ($AQ_B$ × 30)} | | |
| ₹275A | = | ₹2,400 – ₹1,505 – 30 $AQ_B$ | | |
| 30 $AQ_B$ | = | ₹1,170 | | |
| AQ of Materials B | = | ₹1,170 ÷ 30 | = | ***39 units*** |

| | | | | | |
|---|---|---|---|---|---|
| ***3.*** | Material Price Variance | = | (AQ × SP) – (AQ × AP) | | |
| | | = | ₹2,570 - ₹2,675 | = | ***₹105 A*** |
| ***4.*** | Material Usage Variance | = | (SQ × SP) – (AQ × SP) | | |
| | | = | ₹2,400 – ₹2,570 | = | ***₹170 A*** |
| ***5.*** | Material Mix Variance | = | (RSQ × SP) – (AQ × SP) | | |
| | | = | ₹2,616 – ₹2,570 | = | ***₹46 F*** |
| ***6.*** | Material Yield Variance | = | (SQ × SP) – (RSQ × SP) | | |
| | | = | ₹2,400 – ₹2,616 | = | ***₹216 A*** |

***Working notes:***

***a. Basic Calculation***

| ***Materials*** | ***SQ × SP*** | ***RSQ × SP*** | ***AQ × SP*** | ***AQ × AP*** |
|---|---|---|---|---|
| A<br>B | 60 × ₹20<br>40 × ₹30 | 65.4 × ₹20<br>43.6 × ₹30 | 70 × ₹20<br>39 × ₹30 | 70 × ₹21.50<br>39 × ₹30 |
| Total | ₹2,400 | ₹2,616 | ₹2,570 | ₹2,675 |

***b.*** RSQ (Revised Standard Quantity):

| | | | | |
|---|---|---|---|---|
| Materials A | = | 109 units × 60/100 | = | 65.4 units |
| Materials B | = | 109 units × 40/100 | = | 43.6 units |

## ***BQ 15***

Following data is extracted from the books of XYZ Ltd. for the month of January, 2023:

***1. Estimation:***

| ***Particulars*** | ***Quantity (kg.)*** | ***Price (₹)*** | ***Amount (₹)*** |
|---|---|---|---|
| Material A<br>Material B | 800<br>600 | ?<br>30.00 | -<br>18,000 |

Normal loss was expected to be 10% of total input materials.

***2. Actuals:*** 1480 kg of output produced.

| ***Particulars*** | ***Quantity (kg.)*** | ***Price (₹)*** | ***Amount (₹)*** |
|---|---|---|---|
| Material A<br>Material B | 900<br>? | ?<br>32.50 | -<br>- |
| | | | 59,825 |

***3. Other Information:***

| | |
|---|---|
| Material Cost Variance | ₹3,625 (F) |
| Material Price Variance | ₹175 (F) |

***You are required to calculate:***

***1.*** Standard Price of Material A;
***2.*** Actual Quantity of Material B;
***3.*** Actual Price of Material A;
***4.*** Revised standard quantity of Material A and Material B; and
***5.*** Material Mix Variance.

## ***Answer***

| | | | |
|---|---|---|---|
| ***1.*** | Material Cost Variance | = | (SQ × SP) – (AQ × AP) |
| | ₹3,625 | = | (SQ × SP) – ₹59,825 |
| | (SQ × SP) | = | ₹63,450 |
| | $(SQ_A \times SP_A) + (SQ_B \times SP_B)$ | = | ₹63,450 |
| | (940 kg × $SP_A$) + (705 kg ×₹30) | = | ₹63,450 |
| | (940 kg × $SP_A$) + ₹21,150 | = | ₹63,450 |

| | | | | |
|---|---|---|---|---|
| ($940$ kg × $SP_A$) | = | ₹42,300 | | |
| $SP_A$ | = | 42,300 ÷ 940 kg | | |
| Standard Price of Material A | = | ***₹45*** | | |

***Working notes:***

| | | | | | |
|---|---|---|---|---|---|
| ***(a)*** | SQ of input for actual output | = | 1,480 kg ÷ 90% | = | 1,645 kgs |
| | Materials A | = | 1,645 kgs × 8/14 | = | 940 kgs |
| | Materials B | = | 1,645 kgs × 6/14 | = | 705 kgs |
| ***2.*** | Material Price Variance (A + B) | = | (AQ × SP) – (AQ × AP) | | |
| | ₹175 | = | (AQ × SP) – ₹ 59,825 | | |
| | (AQ × SP) | = | ₹60,000 | | |
| | ($AQ_A$ × $SP_A$) + ($AQ_B$ × $SP_B$) | = | ₹60,000 | | |
| | (900 kg × ₹45) + ($AQ_B$ × ₹30) | = | ₹60,000 | | |
| | ($AQ_B$ × ₹30) | = | ₹60,000 - ₹40,500 | = | ₹19,500 |
| | Actual Quantity of Material B | = | ₹19,500 ÷ ₹30 | = | ***650 kg.*** |
| ***3.*** | Actual Material Cost (A + B) | = | (AQ × AP) | = | ₹59,825 |
| | ($AQ_A$ × $AP_A$) + ($AQ_B$ × $AP_B$) | = | ₹59,825 | | |
| | (900 kg × $AP_A$) + (650 kg × ₹ 32.5) | = | ₹59,825 | | |
| | (900 kg × $AP_A$) + ₹21,125 | = | ₹59,825 | | |
| | (900 kg × $AP_A$) | = | ₹38,700 | | |
| | Actual Price of Material A | = | ₹38,700 ÷ 900 kg | = | ***₹43*** |
| ***4.*** | Revised Standard Quantity (RSQ) of A & B: | | | | |
| | Materials A | = | (900 + 650) × 8/14 | = | ***886 kgs*** |
| | Materials B | = | (900 + 650) × 6/14 | = | ***664 kgs*** |
| ***5.*** | Material Mix Variance (A + B) | = | (RSQ × SP) – (AQ × SP) | | |
| | | = | (886 × 45) + (664 × 30) – 60,000 | | |
| | | = | ***₹210 A*** | | |

## BQ 16

One kilogram of product K requires two chemicals A and B. The following were the details of product K for the month of June 2023:

***(a)*** Standard mix for chemical A is 50% and chemical B is 50%.
***(b)*** Standard price kilogram of chemical A is ₹12 and chemical B is ₹15.
***(c)*** Actual input of chemical B is 70 kilograms.
***(d)*** Actual price per kilogram of chemical A is ₹15.
***(e)*** Standard normal loss is 10% of total input.
***(f)*** Total Material cost variance is ₹650 adverse.
***(g)*** Total Material yield variance is ₹135 adverse.

***You are required to calculate:***

***(1)*** Total Material mix variance
***(2)*** Total Material usage variance
***(3)*** Total Material price variance
***(4)*** Actual loss of actual input
***(5)*** Actual input of chemical A
***(6)*** Actual price per kg. of chemical B

## Answer

| | | | | | |
|---|---|---|---|---|---|
| ***(1)*** | Material Mix Variance | = | (RSQ × SP) – (AQ × SP) | | |
| | | = | ₹1,485 – ₹1,530 | = | ***₹45 A*** |

**(2)** Material Usage Variance = (SQ × SP) – (AQ × SP)
= ₹1,350 – ₹1,530 = ***₹180 A***

**(3)** Material Price Variance = (AQ × SP) – (AQ × AP)
= ₹1,530 – ₹2,000 = ***₹470 A***

**(4)** Actual loss of actual input = Actual input – Actual output
= 110 kg – 90 kg = ***20 Kgs***

**(5)** Actual input of chemical A = ***40 Kgs***

**(6)** Actual Price per kg of B = ***₹20***

***Working Notes:***

***(a) Calculation of standard mix of input (assuming Standard input as 100 kg, it will be given in exam):***

| Material | Quantity in Kg | Rate | Amount |
|---|---|---|---|
| A | 50 | 12.00 | 600.00 |
| B | 50 | 15.00 | 750.00 |
| | ***100*** | | ***1,350.00*** |
| Loss: (10%) | 10 | | NIL |
| | ***90*** | | ***1,350.00*** |

**(b)** Let the actual input of chemical A be X kg. and the actual price of chemical B be ₹Y

***Given,***

Material Yield Variance = (Total Standard input – Total Actual input) × Std cost p. u. of input
135 A = [100 – (70 + X)] × 13.5 (1,350 ÷ 100 kg)
-135 = (30 – X) × 13.5
-10 = 30 – X
***X*** = ***40 Kg.***

***Also,***

Material Cost Variance = (SQ × SP) – (AQ × AP)
650 A = 1,350 – {(40 × 15) + (70 × Y)}
- 650 = 1,350 – 600 – 70 Y
- 650 – 750 = 70 Y
***Y*** = ***₹20***

***(c) Basic Calculation***

| Materials | SQ × SP | RSQ × SP | AQ × SP | AQ × AP |
|---|---|---|---|---|
| A | 50 × ₹12 | 55 × ₹12 | 40 × ₹12 | 40 × ₹15 |
| B | 50 × ₹15 | 55 × ₹15 | 70 × ₹15 | 70 × ₹20 |
| Total | ₹1,350 | ₹1,485 | ₹1,530 | ₹2,000 |

**(d)** RSQ (Revised Standard Quantity):

Materials A = 110 units × 50/100 = 55 units
Materials B = 110 units × 50/100 = 55 units

## LABOUR COST VARIANCE

***BQ 17***

The following details are available from the records of ABC Ltd. engaged in manufacturing article A of the week ended 28th February:

The standard labour hours and rates of payment per article were as following:

| *Category of workers* | *Hours* | *Rate per hour* | *Total* |
|---|---|---|---|
| Skilled labour | 10 | ₹3.00 | ₹30.00 |
| Semi-skilled labour | 8 | ₹1.50 | ₹12.00 |
| Unskilled labour | 16 | ₹1.00 | ₹16.00 |
| ***Total*** | ***34*** | - | ***₹58.00*** |

The actual production was 1,000 articles A for which the actual hours worked and rates are given below:

| *Category of workers* | *Hours* | *Rate per hour* | *Total* |
|---|---|---|---|
| Skilled labour | 9,000 | ₹4.00 | ₹36,000 |
| Semi-skilled labour | 8,400 | ₹1.50 | ₹12,600 |
| Unskilled labour | 20,000 | ₹0.90 | ₹18,000 |
| ***Total*** | ***37,400*** | - | ***₹66,600*** |

***From the above set of data, you are asked to calculate:***

***(i)*** Labour Cost Variance; ***(ii)*** Labour Rate Variance; ***(iii)*** Labour Efficiency; ***(iv)*** Labour Mix Variance and ***(v)*** Labour Yield Variance.

***[(i) 8,600 A (ii) 7,000 A (iii) 1,600 A (iv) 4,200 F (v) 5,800 A]***

### *BQ 18*

The standard labour employment and the actual labour engaged in a week for a job are as under:

| *Particulars* | *Skilled Workers* | *Semi-Skilled Workers* | *Unskilled Workers* |
|---|---|---|---|
| Standard number of workers in the gang | 32 | 12 | 6 |
| Standard wage rate per hour (₹) | 3.00 | 2.00 | 1.00 |
| Actual number of workers in the gang | 28 | 18 | 4 |
| Actual wage rate per hour (₹) | 4.00 | 3.00 | 2.00 |

During the 40 hours working week, the gang produced 1,800 standard labour hours of work.

***Calculate the various labour variances.***

***[LRV 2,000 A, LMV 80 F, LYV 504 A, LEV 424 A, LCV 2,424 A]***

### *BQ 19*

A gang of workers usually consists of 10 men, 5 women and 5 boys in a factory. They are paid at standard hourly rate of ₹1.25, ₹0.80 and ₹0.70 respectively. In a normal working week of 40 hours, the gang is expected to produce 1,000 units of output.

In a certain week, the gang consisted of 13 men, 4 women and 3 boys. Actual wages were paid at the rate of ₹1.20, ₹0.85 and ₹0.65 respectively. Two hours were lost due to abnormal idle time and 960 units of output were produced.

***Calculate various labour variances.***

***[LRV 24 F, Idle 43 A, LMV 59 A, LYV 8 F, LEV 51 A, LCV 70 A]***

### *BQ 20*

A building can be constructed by engaging a gang of workers in 100 working days of eight hours each as per details given below:

***Standard data:***

| | *Skilled* | *Semi-skilled* | *Unskilled* |
|---|---|---|---|
| No. of workers in the gang | 6 | 8 | 6 |
| Standard rate of wage per hour | ₹25 | ₹20 | ₹16 |

***Actual completion*** of the work however took 104 days of eight hours each. This includes 16 hours of stoppages due to heavy rains. The actual number of workers engaged and the actual rates paid are given below:

| | *Skilled* | *Semi-skilled* | *Unskilled* |
|---|---|---|---|
| Number of workers engaged | 8 | 6 | 6 |
| Actual wage rate per hour | ₹30 | ₹24 | ₹16 |

***Calculate:***

***(a)*** Labour Cost Variances; ***(b)*** Labour Rate Variance; ***(c)*** Labour Efficiency Variance; ***(d)*** Labour Mix Variance; ***(e)*** Labour Yield Variance; ***(f)*** Idle Time Variance.

### *Answer*

| | | | | | |
|---|---|---|---|---|---|
| ***(a)*** | Labour Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | | = | ₹3,24,800 - ₹3,99,360 | = | ***₹74,560 A*** |
| ***(b)*** | Labour Rate Variance | = | (AH × SR) – (AH × AR) | | |
| | | = | ₹3,46,112 – ₹3,99,360 | = | ***₹53,248 A*** |
| ***(c)*** | Labour Efficiency Variance | = | (SH × SR) – (AHW × SR) | | |
| | | = | ₹3,24,800 – ₹3,39,456 | = | ***₹14,656 A*** |
| ***(d)*** | Labour Mix Variance | = | (RSH × SR) – (AHW × SR) | | |
| | | = | ₹3,31,296 – ₹3,39,456 | = | ***₹8,160 A*** |
| ***(e)*** | Labour Yield Variance | = | (SH × SR) – (RSH × SR) | | |
| | | = | ₹3,24,800 – ₹3,31,296 | = | ***₹6,496 A*** |
| ***(f)*** | Labour Idle Variance | = | (AHW × SR) – (AH × SR) | | |
| | | = | ₹3,39,456 – ₹3,46,112 | = | ***₹6,656 A*** |

***Working notes:***

***Basic Calculation***

| *Workers* | *SH × SR* | *RSH × SR* | *AHW × SR* | *AH × SR* | *AH × AR* |
|---|---|---|---|---|---|
| A | 100 × 8 × 6 × 25 | 102 × 8 × 6 × 25 | 102 × 8 × 8 × 25 | 104 × 8 × 8 × 25 | 104 × 8 × 8 × 30 |
| B | 100 × 8 × 8 × 20 | 102 × 8 × 8 × 20 | 102 × 8 × 6 × 20 | 104 × 8 × 6 × 20 | 104 × 8 × 6 × 24 |
| C | 100 × 8 × 6 × 16 | 102 × 8 × 6 × 16 | 102 × 8 × 6 × 16 | 104 × 8 × 6 × 16 | 104 × 8 × 6 × 16 |
| Total | ₹3,24,800 | ₹3,31,296 | ₹3,39,456 | ₹3,46,112 | ₹3,99,360 |

### *BQ 21*

The standard and actual figures of a firm are as under:

| | |
|---|---|
| Standard time for the job | 1,000 hours |
| Standard rate per hour | ₹0.50 |
| Actual time taken | 900 hours |
| Actual wages paid | ₹360 |

***Compute the variances***

### *Answer*

| | | | | | |
|---|---|---|---|---|---|
| ***1.*** | Labour Rate Variance | = | (AH × SR) – (AH × AR) | | |
| | | = | (900 × ₹0.50) – ₹360 | = | ***₹90 F*** |
| ***2.*** | Labour Efficiency Variance | = | (SH × SR) – (AH × SR) | | |
| | | = | (1,000 × ₹0.50) – (900 × ₹0.50) | = | ***₹50 F*** |
| ***3.*** | Labour Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | | = | (1,000 × ₹0.50) – ₹360 | = | ***₹140 F*** |

### *BQ 22*

NPX Ltd. uses standard costing system for manufacturing of its product X. Following is the budget data given in relation to labour hours for manufacture of 1 unit of Product X:

| *Labour* | *Hours* | *Rate (₹)* |
|---|---|---|
| Skilled | 2 | 6 |
| Semi-Skilled | 3 | 4 |

| | | |
|---|---|---|
| Un-Skilled | 5 | 3 |
| Total | 10 | - |

In the month of January, 2023, total 10,000 units were produced following are the details:

| Labour | Hours | Rate (₹) | Amount (₹) |
|---|---|---|---|
| Skilled | 18,000 | 7 | 1,26,000 |
| Semi-Skilled | 33,000 | 3.5 | 1,15,500 |
| Un-Skilled | 58,000 | 4 | 2,32,000 |
| Total | 1,09,000 | - | 4,73,500 |

Actual Idle hours (abnormal) during the month:

| | |
|---|---|
| Skilled | 500 |
| Semi-Skilled | 700 |
| Un-skilled | 800 |
| Total | 2,000 |

***Calculate:***

***(a)*** Labour Variances.

***(b)*** Also show the effect on Labour Rate Variance if 5,000 hours of Skilled Labour are paid @ ₹5.5 per hour and balance were paid @ ₹7 per hour.

## *Answer*

### *(a) Calculation of Labour Variances:*

| | | | | |
|---|---|---|---|---|
| Labour Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | = | ₹3,90,000 - ₹4,73,500 | = | ***₹83,500 A*** |
| Labour Rate Variance | = | (AH × SR) – (AH × AR) | | |
| | = | ₹4,14,000 – ₹4,73,500 | = | ***₹59,500 A*** |
| Labour Efficiency Variance | = | (SH × SR) – (AHW × SR) | | |
| | = | ₹3,90,000 – ₹4,05,800 | = | ***₹15,800 A*** |
| Labour Mix Variance | = | (RSH × SR) – (AHW × SR) | | |
| | = | ₹4,17,300 – ₹4,05,800 | = | ***₹11,500 F*** |
| Labour Yield Variance | = | (SH × SR) – (RSH × SR) | | |
| | = | ₹3,90,000 – ₹4,17,300 | = | ***₹27,300 A*** |
| Labour Idle Variance | = | (AHW × SR) – (AH × SR) | | |
| | = | ₹4,05,800 – ₹4,14,000 | = | ***₹8,200 A*** |

### *(b) Labour Rate Variance revised:*

| | | | | |
|---|---|---|---|---|
| Labour rate Variance | = | (AH × SR) – (AH × AR) | | |
| Skilled | = | (18,000×6) – (5,000×5.5 + 13,000×7) | = | 10,500 A |
| Semi-Skilled | = | 33,000 × (4 – 3.5) | = | 16,500 F |
| Un-Skilled | = | 58,000 × (3 - 4) | = | 58,000 A |
| Total | = | 10,500 A + 16,500 F + 58,000 A | = | ***₹52,000 A*** |

Effect on Labour Rate Variance= ***Adverse effect decreased by ₹7,500 (₹59,500A to ₹52,000 A)***

***Working notes:***

***1. Basic Calculation***

| Workers | SH × SR | RSH × SR | AHW × SR | AH × SR | AH × AR |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Skilled<br>Semi-Skilled<br>Un-Skilled | 20,000 × 6<br>30,000 × 4<br>50,000 × 3 | 21,400 × 6<br>32,100 × 4<br>53,500 × 3 | 17,500 × 6<br>32,300 × 4<br>57,200 × 3 | 18,000 × 6<br>33,000 × 4<br>58,000 × 3 | 18,000 × 7<br>33,000 × 3.5<br>58,000 × 4 |
| Total | ₹3,90,000 | ₹4,17,300 | ₹4,05,800 | ₹4,14,000 | ₹4,73,500 |

**2. RSH (Revised Standard Hours):**

Total Actual Hours Worked = 17,500 + 32,300 + 57,200 = 1,07,000 hours

Skilled = 1,07,000 × 2/10 = 21,400 hours
Semi-Skilled = 1,07,000 × 3/10 = 32,100 hours
Un-Skilled = 1,07,000 × 5/10 = 53,500 hours

**3. SH (Standard hours) for actual output 10,000 units:**

Skilled = 10,000 × 2 = 20,000 hours
Semi-Skilled = 10,000 × 3 = 30,000 hours
Un-Skilled = 10,000 × 5 = 50,000 hours

## BQ 23

The standard output of a Product 'D' is 50 units per hour in manufacturing department of a Company employing 100 workers. In a 40 hours week, the department produced 1,920 units of product 'D' despite 5% of the time paid was lost due to an abnormal reason. The hourly wage rates actually paid were ₹12.40, ₹12.00 and ₹11.40 respectively to Group 'A' consisting 10 workers, Group 'B' consisting 30 workers and Group 'C' consisting 60 workers. The standard wage rate per labour is same for all the workers. Labour Efficiency Variance is given ₹480 (F).

***You are required to compute:***

**(1)** Total Labour Cost Variance.
**(2)** Total Labour Rate Variance.
**(3)** Total Labour Gang Variance.
**(4)** Total Labour Yield Variance, and
**(5)** Total Labour Idle Time Variance.

## Answer

**(1)** Labour Cost Variance = (SH × SR) – (AH × AR)
= ₹46,080 - ₹46,720 = ***₹640 A***

**(2)** Labour Rate Variance = (AH × SR) – (AH × AR)
= ₹48,000 – ₹46,720 = ***₹1,280 F***

**(3)** Labour Gang Variance = (RSH × SR) – (AHW × SR)
= ₹45,600 – ₹45,600 = ***Nil***

**(4)** Labour Yield Variance = (SH × SR) – (RSH × SR)
= ₹46,080 – ₹45,600 = ***₹480 F***

**(5)** Labour Idle Variance = (AHW × SR) – (AH × SR)
= ₹45,600 – ₹48,000 = ***₹2,400 A***

***Working notes:***

***(a) Basic Calculation***

| Workers | SH × SR | RSH × SR | AHW × SR | AH × SR | AH × AR |
|---|---|---|---|---|---|
| Group A<br>Group B<br>Group C | 384 × 12<br>1,152 × 12<br>2,304 × 12 | 380 × 12<br>1,140 × 12<br>2,280 × 12 | 380 × 12<br>1,140 × 12<br>2,280 × 12 | 10×40×12<br>30×40×12<br>60×40×12 | 10×40×12.40<br>30×40×12.00<br>60×40×11.40 |
| Total | ₹46,080 | ₹45,600 | ₹45,600 | ₹48,000 | ₹46,720 |

### (b) RSH (Revised Standard Hours) and AHW (Actual Hours Worked):

| | | | | |
|---|---|---|---|---|
| Total Actual Hours Worked | = | (100 workers × 40 hours) – 5% abnormal idle time | | |
| | = | 3,800 hours | | |
| Group A | = | 3,800 × 10/100 | = | 380 hours |
| Group B | = | 3,800 × 30/100 | = | 1,140 hours |
| Group C | = | 3,800 × 60/100 | = | 2,280 hours |

### (c) SH (Standard hours) for actual output 1,920 units:

| | | | | |
|---|---|---|---|---|
| Total standard hours | = | (100 workers × 1 hour ÷ 50 units) × 1,920 units | | |
| | = | 3,840 hours | | |
| Group A | = | 3,840 × 10/100 | = | 384 hours |
| Group B | = | 3,840 × 30/100 | = | 1,152 hours |
| Group C | = | 3,840 × 60/100 | = | 2,304 hours |

### (d) Standard wages rate (SR):

| | | | | |
|---|---|---|---|---|
| Labour Efficiency Variance | = | (SH - AHW) × SR | | |
| 480 F | = | (3,840 – 3,800) × SR | | |
| SR | = | 480 ÷ 40 | = | ₹12 per hour |

## OVERHEAD VARIANCE

### BQ 24

The following data for Pijee Ltd. is given:

| Particulars | Budgeted | Actual |
|---|---|---|
| Production in units | 400 | 360 |
| Man hours to produce above | 8,000 | 7,000 |
| Variable overheads | ₹10,000 | ₹9,150 |

The standard time to produce one unit of the product is 20 hours.

***Calculate relevant Variable overhead variances.***

### Answer

| | | | | | |
|---|---|---|---|---|---|
| *(i)* | Variable Overhead Cost variance | = | (SH × SR) - (AH × AR) | | |
| | | = | (360 × 20 hours × ₹1.25) - ₹9,150 | = | ***150 A*** |
| *(ii)* | Variable OH Expenditure Variance | = | (AH × SR) - (AH × AR) | | |
| | | = | (7,000 × ₹1.25) - ₹9,150 | = | ***400 A*** |
| *(iii)* | Variable OH Efficiency Variance | = | (SH × SR) - (AH × SR) | | |
| | | = | (360 × 20 hours × ₹1.25) - (7,000 × ₹1.25)= | | ***250 F*** |

***Working Notes:***

| | | | | | |
|---|---|---|---|---|---|
| *(a)* | Standard Rate (SR) | = | Budgeted Variable Overheads ÷ Budgeted Hours | | |
| | | = | ₹10,000 ÷ 8,000 hours | = | ***₹1.25 per hour*** |

### BQ 25

From the following information of G Ltd., Calculate ***(i)*** Variable Overhead Cost Variance; ***(ii)*** Variable Overhead Expenditure Variance and ***(iii)*** Variable Overhead Efficiency Variance:

| | |
|---|---|
| Budgeted production | 6,000 units |
| Budgeted variable overhead | ₹1,20,000 |
| Standard time for one unit of output | 2 hours |
| Actual production | 5,900 units |

| | |
|---|---|
| Actual overhead incurred | ₹1,22,000 |
| Actual hours worked | 11,600 hours |

***Answer***

***(i)*** Variable Overhead Cost variance = (SH × SR) - (AH × AR)
= (11,800 × ₹10) - ₹1,22,000 = ***4,000 A***

***(ii)*** Variable OH Expenditure Variance = (AH × SR) - (AH × AR)
= (11,600 × ₹10) - ₹1,22,000 = ***6,000 A***

***(iii)*** Variable OH Efficiency Variance = (SH × SR) - (AH × SR)
= (11,800 × ₹10) - (11,600 × ₹10) = ***2,000 F***

***Working Notes:***

***(a)*** Standard Hours (SH) = 5,900 units × 2 hours per unit = ***11,800 hours***

***(b)*** Standard Rate (SR) = Budgeted Variable Overheads ÷ Budgeted Hours
= ₹1,20,000 ÷ 6,000 units × 2 hours = ***₹10 per hour***

***BQ 26***

The cost detail of J&G Ltd. for the month of September, 2023 is as follows:

| ***Particulars*** | ***Budgeted*** | ***Actual*** |
|---|---|---|
| Fixed overhead | ₹15,00,000 | ₹15,60,000 |
| Units of production | 7,500 | 7,800 |
| Standard time for one unit | 2 hours | - |
| Actual hours worked | - | 16,000 hours |

***Required:***

Calculate ***(i)*** Fixed Overhead Cost Variance ***(ii)*** Fixed Overhead Expenditure Variance ***(iii)*** Fixed Overhead Volume Variance ***(iv)*** Fixed Overhead Efficiency Variance and ***(v)*** Fixed Overhead Capacity Variance.

***Answer***

***(1)*** Fixed Overhead Cost Variance = Recovered Fixed OH – Actual Fixed OH

$$= \frac{15,00,000}{7,500} \times 7,800 - ₹15,60,000 = \textit{Nil}$$

***(2)*** Fixed OH Expenditure Variance = Budgeted Fixed OH – Actual Fixed OH
= ₹15,00,000 – ₹15,60,000 = ***60,000 A***

***(3)*** Fixed OH Volume Variance = Recovered Fixed OH – Budgeted Fixed OH

$$= \frac{15,00,000}{7,500} \times 7,800 - ₹15,00,000 = \textit{60,000 F}$$

***(4)*** Fixed OH Efficiency Variance = Recovered Fixed OH – Recovered Fixed OH for AH
= SH × SR – AH × SR

$$= \frac{15,00,000}{7,500} \times 7,800 - \frac{15,00,000}{7,500 \times 2} \times 16,000$$

= ₹15,60,000 - ₹16,00,000 = ***40,000 A***

***(5)*** Fixed OH Capacity Variance = Recovered Fixed OH for AH - Budgeted Fixed OH
= ₹16,00,000 - ₹15,00,000 = ***1,00,000 F***

***BQ 27***

Following information is available from the records of a factory:

| ***Particulars*** | ***Budget*** | ***Actual*** |
|---|---|---|

| | | |
|---|---|---|
| Fixed overhead for June, 2017 | ₹10,000 | ₹12,000 |
| Production in June, 2017 (units) | 2,000 | 2,100 |
| Standard time per unit (hours) | 10 | - |
| Actual hours worked in June | - | 22,000 |

***Compute:*** ***(i)*** Fixed Overhead Cost Variance, ***(ii)*** Expenditure Variance, ***(iii)*** Volume Variance.

***Answer***

***(i)*** Fixed Overhead Variance = Absorbed Overheads – Actual Overheads
= (2,100 units × 10 hours × ₹0.50*) – 12,000
= 10,500 – 12,000 = ***1,500 A***

***(ii)*** Fixed OH Expenditure Variance = Budgeted Overheads - Actual Overheads
= 10,000 - 12,000 = ***2,000 A***

***(iii)*** Fixed OH Volume Variance = Absorbed Overheads – Budgeted Overheads
= 10,500 – 10,000 = ***500 F***

*Standard Rate (SH) per hour $= \frac{\text{Budgeted OH}}{\text{Budgeted Hours}}$

$= \frac{10{,}000}{2{,}000 \text{ Units} \times 10 \text{ Hours per unit}}$ = ***₹0.50***

***BQ 28***

S.V. Ltd. has furnished the following data:

| ***Particulars*** | ***Budget*** | ***Actual, May' 23*** |
|---|---|---|
| No. of working days | 25 | 27 |
| Production in units | 20,000 | 22,000 |
| Fixed Overheads (₹) | 30,000 | 31,000 |

Budgeted fixed overhead rate is ₹1.00 per hour. In May' 23, the actual hours worked were 31,500.

***Calculate the following variances in relation to fixed overheads:***

***(i)*** Efficiency Variance ***(ii)*** Capacity Variance ***(iii)*** Calendar Variance
***(iv)*** Expenditure Variance ***(v)*** Volume Variance ***(vi)*** Total OH Variance.

***[(i) 1,500 F (ii) 900 A (iii) 2,400 F (iv) 1,000 A (v) 3,000 F (vi) 2,000 F]***

***BQ 29***

A company has a normal capacity of 120 machines, working 8 hours per day of 25 days in a month. The fixed overheads are budgeted at ₹1,44,000 per month. The standard time required to manufacture one unit of product is 4 hours.

In April, the company worked 24 days of 840 machine hours per day and produced 5,305 units of output. The actual fixed overheads were ₹1,42,000.

***Compute:*** ***(i)*** Expense Variance; ***(ii)*** Volume Variance and ***(iii)*** Total Fixed Overheads Variance

***Answer***

***(i)*** Fixed OH Expenditure Variance = (BH × SR) - (AH × AR)
= 1,44,000 - 1,42,000 = ***2,000 F***

***(ii)*** Total Volume Variance = (SH × SR) – (BH × SR)
= (5,305 units × 4 hours × ₹6*) – 1,44,000
= 1,27,320 – 1,44,000 = ***16,680 A***

***(iii)*** Fixed overhead variance = (SH × SR) - (AH × AR)
= 1,27,320 – 1,42,000 = ***14,680 A***

$$\text{*Standard Rate (SH) per hour} = \frac{\text{Budgeted OH}}{\text{Budgeted Hours}}$$

$$= \frac{1{,}44{,}000}{120 \text{ Machines} \times 8 \text{ Hours} \times 25 \text{ Days}} = ₹6/\text{hour}$$

### BQ 30

The following data has been collected from the cost records of a unit for computing the various fixed overhead variances for a period.

| | |
|---|---|
| Number of budgeted working days | 25 |
| Budgeted man-hours per day | 6,000 |
| Output (budgeted) per man-hour (in units) | 1 |
| Fixed overhead cost as budgeted | ₹1,50,000 |
| Actual number of working days | 27 |
| Actual man-hours per day | 6,300 |
| Actual output per man-hour (in units) | 0.9 |
| Actual fixed overhead incurred | ₹1,56,000 |

***Calculate the following variances:***

***(i)*** Efficiency Variance ***(ii)*** Capacity Variance ***(iii)*** Calendar Variance
***(iv)*** Expenses Variance ***(v)*** Volume Variance ***(vi)*** Total Fixed OH Variance

***[(i) 17,010 A (ii) 8,100 F (iii) 12,000 F (iv) 6,000 A (v) 3,090 F (vi) 2,910 A]***

### BQ 31

Kolkata Furniture manufactures modular tables, chairs and office desks. The standard labour time required per unit of table, chair and desk are 4 hours, 2 hours and 8 hours respectively. The budgeted production per week is 140 standard hours and budgeted fixed overheads per week are ₹70,000.

***During a particular week the firm achieved the following output:***

| | | |
|---|---|---|
| Tables | : | 8 units |
| Chairs | : | 8 units |
| Desks | : | 9 units |

The actual fixed production overhead amounted to ₹75,000.

***Calculate:***

***(i)*** Fixed Production Overhead Total Variance
***(ii)*** Fixed Production Overhead Expenditure Variance
***(iii)*** Fixed Production Overhead Volume Variance

***[(i) 15,000 A (ii) 5,000 A (iii) 10,000 A]***

### BQ 32

The following information was obtained from the records of a manufacturing unit using standard costing system.

| ***Particulars*** | ***Budget*** | ***Actual, March' 23*** |
|---|---|---|
| Production in units | 4,000 | 3,800 |
| No. of working days | 20 | 21 |
| Fixed Overheads | ₹40,000 | ₹39,000 |
| Variable Overheads | ₹12,000 | ₹12,000 |

***You are required to calculate the following overhead variance:***

***(a)*** Variable Overhead Variance
***(b)*** Fixed Overheads Variances:
***(i)*** Expenditure Variance ***(ii)*** Volume Variance ***(iii)*** Overhead Variance

***[(a) 600 A (b)(i) 1,000 F (ii) 2,000 A (iii) 1,000 A]***

## BQ 33

AB Company Ltd. is having standard costing system in operation for quite some time. The following data relating to the month of April, is available from the cost records:

| Particulars | Budget | Actual |
|---|---|---|
| Output (in units) | 30,000 | 32,500 |
| Operating hours | 30,000 | 33,000 |
| Fixed Overheads (₹) | 45,000 | 50,000 |
| Variable Overheads (₹) | 60,000 | 68,000 |
| Working Days | 25 | 26 |

***Calculate overheads variances.***

***[FOH Variances: Cost 1,250 A, Exp. 5,000 A, Vol. 3,750 F, Cal. 1,800 F, Cap. 2,700 F, Eff. 750 A and VOH Variances: Cost 3,000 A, Expenditure 2,000 A, Efficiency 1,000 A]***

## BQ 34

The following information was obtained from the records of a manufacturing unit using standard costing system.

| Particulars | Standard | Actual |
|---|---|---|
| Production | 4,000 units | 3,800 units |
| Working Days | 20 | 21 |
| Machine hours | 8,000 hours | 7,800 hours |
| Fixed Overhead | ₹4,00,000 | ₹3,90,000 |
| Variable Overhead | ₹1,20,000 | ₹1,20,000 |

***You are required to calculate the following overhead variance:***

***(a)*** Variable overhead variances
***(b)*** Fixed overhead variances

### Answer

***(a) Variable Overheads Variances:***

Variable OH Cost variance = (SH × SR) - (AH × AR)
= (7,600 × ₹15) – ₹1,20,000 = ***6,000 A***

Variable OH Expenditure Variance = (AH × SR) - (AH × AR)
= (7,800 × ₹15) - ₹1,20,000 = ***3,000 A***

Variable OH Efficiency Variance = (SH × SR) - (AH × SR)
= (7,600 × ₹15) - (7,800 × ₹15) = ***3,000 A***

***(b) Fixed Overhead Variances:***

Fixed OH Cost Variance = (SH × SR) - (AH × AR)
= (7,600 × ₹50) – ₹3,90,000 = ***10,000 A***

Fixed OH Expenditure Variance = (BH × SR) - (AH × AR)
= ₹4,00,000 – ₹3,90,000 = ***10,000 F***

Fixed OH Volume Variance = (SH × SR) - (BH × SR)
= (7,600 × ₹50) – ₹4,00,000 = ***20,000 A***

Fixed OH Efficiency Variance = (SH × SR) - (AH × SR)
= (7,600 × ₹50) – (7,800 × ₹50) = ***10,000 A***

Fixed OH Capacity Variance = (AH × SR) - (CH × SR)
= (7,800 × ₹50) - (8,400 × ₹50) = ***30,000 A***

| | | |
|---|---|---|
| Fixed OH Calendar Variance | = | (CH × SR) - (BH × SR) |
| | = | (8,400 × ₹50) - ₹4,00,000 = **20,000 F** |

**Working Notes:**

| | | | |
|---|---|---|---|
| **(a)** | Standard Hours (SH) for 3,800 units | = | (8,000 hours ÷ 4,000 units) × 3,800 units |
| | | = | **7,600 hours** |
| **(b)** | Standard Rate (SR) Variable OH | = | Budgeted Variable Overheads ÷ Budgeted Hours |
| | | = | ₹1,20,000 ÷ 8,000 hours = **₹15/hour** |
| **(c)** | Standard Rate (SR) Fixed OH | = | Budgeted Fixed Overheads ÷ Budgeted Hours |
| | | = | ₹4,00,000 ÷ 8,000 hours = **₹50/hour** |
| **(d)** | Calendar Hours | = | (8,000 hours ÷ 20 days) × 21 days = **8,400 hours** |
| **(e)** | Standard Rate (SR) Fixed OH | = | Budgeted Fixed Overheads ÷ Budgeted Hours |
| | | = | ₹4,00,000 ÷ 8,000 hours = **₹50/hour** |

## BQ 35

XYZ Company has established the following standards for factory overheads:

| | | |
|---|---|---|
| Variable overheads per unit | : | ₹10 |
| Fixed overheads per month | : | ₹1,00,000 |
| Capacity of the plant | : | 20,000 units per month. |

**The actual data for the month are as follows:**

| | | |
|---|---|---|
| Actual overheads incurred | : | ₹3,00,000 |
| Actual output (units) | : | ₹15,000 units |

**Calculate overhead variances:**

**(i)** Production Volume Variance
**(ii)** Overhead Expense Variance

### Answer

**(i) Production or Overhead volume variance (only for fixed overhead)**

| | | |
|---|---|---|
| Fixed Overhead Volume Variance | = | Absorbed Overhead – Budgeted Overhead |
| | = | (₹5* × 15,000 units) – (₹5 × 20,000 units) |
| | = | ₹75,000 - ₹1,00,000 |
| | = | **₹25,000 A** |
| *Standard fixed overhead per unit | = | ₹1,00,000 ÷ 20,000 units |
| | = | **₹5 per unit** |

**(ii) Overhead Expense Variance:**

| | | |
|---|---|---|
| Variable Overhead | = | Standard Variable OH – Actual Variable OH |
| | = | (15,000 units × ₹10) – (15,000 units × ₹10) |
| | = | **Nil** |
| Fixed Overhead | = | Budgeted Overhead – Actual Overhead |
| | = | ₹1,00,000 – (Total overhead – Variable overhead) |
| | = | ₹1,00,000 – (₹3,00,000 - ₹10 ×15,000 units) |
| | = | ₹1,00,000 – ₹1,50,000 |
| | = | **₹50,000 A** |

**Assumption:** Budgeted variable overheads per unit and actual variable overheads per unit are same.

### *BQ 36*

The overhead expense budget for a factory producing to a capacity of 200 units per month is as follows:

| *Description of overhead* | *Fixed cost per unit in ₹* | *Variable cost per unit in ₹* | *Total cost per unit in ₹* |
|---|---|---|---|
| Power and fuel | 1,000 | 500 | 1,500 |
| Repair and maintenance | 500 | 250 | 750 |
| Printing and stationary | 500 | 250 | 750 |
| Other overheads | 1,000 | 500 | 1,500 |
| ***Total*** | ***₹3,000*** | ***₹1,500*** | ***₹4,500*** |

The factory has actually produced only 100 units in a particular month. Details of overheads actually incurred have been provided by the accounts department are as follows:

| *Description of overhead* | *Actual cost* |
|---|---|
| Power and fuel | ₹4,00,000 |
| Repair and maintenance | ₹2,00,000 |
| Printing and stationary | ₹1,75,000 |
| Other overheads | ₹3,75,000 |

***You are required to compute the production volume variance and the overhead expenses variance.***

### *Answer*

***(i) Production or Overhead volume variance (only for fixed overhead)***

Fixed Overhead Volume Variance = Absorbed Overhead – Budgeted Overhead
= (₹3,000 × 100 units) – (₹3,000 × 200 units)
= ₹3,00,000 - ₹6,00,000 = ***₹3,00,000 A***

***(ii) Overhead Expense Variance:***

Variable Overhead = Standard Variable OH – Actual Variable OH
= (100 units × ₹1,500) – (100 units × ₹1,500)
= ***Nil***

Fixed Overhead = Budgeted Overhead – Actual Overhead
= ₹6,00,000 – (Total overhead – Variable overhead)
= ₹6,00,000 – (₹11,50,000 - ₹1,500 ×100 units)
= ₹6,00,000 – ₹1,50,000 = ***₹4,00,000 A***

***Assumption:*** Budgeted variable overheads per unit and actual variable overheads per unit are same.

## *COMBINED VARIANCE*

### *BQ 37*

The following standards have been set to manufacture a product:

| | | |
|---|---|---|
| Direct Material: | 2 units of A @ ₹4 per unit | ₹8.00 |
| | 3 units of B @ ₹3 per unit | ₹9.00 |
| | 15 units of C @ ₹1 per unit | ₹15.00 |
| | | ***₹32.00*** |
| Direct Labour: | 3 hrs @ ₹8 per hour | ₹24.00 |
| Total standard prime cost | | ***₹56.00*** |

The company manufactured and sold 6,000 units of the product during the year. Direct material costs were 12,500 units of A at ₹4.40 per unit; 18,000 units of B at ₹2.80 per unit; and 88,500 units of C at ₹1.20 per unit. The company worked 17,500 direct labour hours during the year. For 2,500 of these hours, the company paid at ₹12 per hour while for the remaining, the wages were paid at standard rate.

***Calculate all materials and labour variances.***

**Answer**

| | | | | | |
|---|---|---|---|---|---|
| **1.** | Material Price Variance | = | (AQ × SP) – (AQ × AP) | | |
| | | = | ₹1,92,500 - ₹2,11,600 | = | **₹19,100 A** |
| **2.** | Material Mix Variance | = | (RSQ × SP) – (AQ × SP) | | |
| | | = | ₹1,90,400 – ₹1,92,500 | = | **₹2,100 A** |
| **3.** | Material Yield Variance | = | (SQ × SP) – (RSQ × SP) | | |
| | | = | ₹1,92,000 – ₹1,90,400 | = | **₹1,600 F** |
| **4.** | Material Usage Variance | = | (SQ × SP) – (AQ × SP) | | |
| | | = | ₹1,92,000 – ₹1,92,500 | = | **₹500 A** |
| **5.** | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | | = | ₹1,92,000 – ₹2,11,600 | = | **₹19,600 A** |
| **6.** | Labour Rate Variance | = | (AH × SR) – (AH × AR) | | |
| | | = | (17,500 × ₹8) - (2,500 × ₹12 + 15,000 × ₹8) | | |
| | | = | ₹1,40,000 – ₹1,50,000 | = | **₹10,000 A** |
| **7.** | Labour Efficiency Variance | = | (SH × SR) – (AH × SR) | | |
| | | = | (6,000 × 3 hours × ₹8) - (17,500 × ₹8) | | |
| | | = | ₹1,44,000 – ₹1,40,000 | = | **₹4,000 F** |
| **8.** | Labour Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | | = | ₹1,44,000 - ₹1,50,000 | = | **₹6,000 A** |

***Working notes:***

***a. Basic calculation in respect of materials:***

| *Materials* | *SQ × SP* | *RSQ × SP* | *AQ × SP* | *AQ × AP* |
|---|---|---|---|---|
| A | 12,000 × ₹4.00 | 11,900 × ₹4.00 | 12,500 × ₹4.00 | 12,500 × ₹4.40 |
| B | 18,000 × ₹3.00 | 17,850 × ₹3.00 | 18,000 × ₹3.00 | 18,000 × ₹2.80 |
| C | 90,000 × ₹1.00 | 89,250 × ₹1.00 | 88,500 × ₹1.00 | 88,500 × ₹1.20 |
| Total | ₹1,92,000 | ₹1,90,400 | ₹1,92,500 | ₹2,11,600 |

***b.*** RSQ (Revised Standard Quantity)of actual input:

| | | | | |
|---|---|---|---|---|
| Total input of materials | = | 12,500 + 18,000 + 88,500 | = | 1,19,000 units |
| Materials A | = | 1,19,000 × 2/20 | = | 11,900 units |
| Materials B | = | 1,19,000 × 3/20 | = | 17,850 units |
| Materials C | = | 1,19,000 × 15/20 | = | 89,250 units |

***c.*** SQ of input for actual output:

| | | | | |
|---|---|---|---|---|
| Materials A | = | 6,000 units × 2 units | = | 12,000 units |
| Materials B | = | 6,000 units × 3 units | = | 18,000 units |
| Materials C | = | 6,000 units × 15 units | = | 90,000 units |

## BQ 38

JVG Ltd. produces a product and operates a standard costing system and value material and finished goods inventories at standard cost. The information related with the product is as follows:

| *Particulars* | *Cost per unit (₹)* |
|---|---|
| Direct materials (30 kg at ₹350 per kg) | 10,500 |
| Direct labour (5 hours at ₹80 per hour) | 400 |

***The actual information for the month just ended is as follows:***

**1.** The budgeted and actual production for the month of September 2023 is 1,000 units.

**2.** Direct materials: 5,000 kg at the beginning of the month. The closing balance of direct materials for the month was 10,000 kg. Purchases during the month were made at ₹365 per kg. The actual utilization of direct materials was 7,200 kg more than the budgeted quantity.

**3.** Direct labour: 5,300 hours were utilised at a cost of ₹4,34,600.

***Required:***

***(a)*** Direct material price and usage variances.

***(b)*** Direct labour rate and efficiency variances.

### *Answer*

| | | | | | |
|---|---|---|---|---|---|
| ***(a)*** | Material Price Variance | = | AQ Purchased × (SP – AP) | | |
| | | = | 42,200 × (₹350 – ₹365) | = | ***₹6,33,000 A*** |
| | Material Usage Variance | = | SP × (SQ – AQ used) | | |
| | | = | ₹350 × (30,000 - 37,200) | = | ***₹25,20,000 A*** |

***Working Note:***

***Calculation of quantity of material purchased and used:***

| | |
|---|---|
| No. of units produced | 1,000 units |
| Standard input per unit | 30 kg. |
| Standard quantity (Kg.) | 30,000 kg. |
| Add: Excess usage | 7,200 kg. |
| Actual Quantity used | 37,200 kg. |
| Add: Closing Stock | 10,000 kg. |
| Less: Opening stock | 5,000 kg. |
| Quantity of Material purchased | 42,200 kg. |

| | | | | | |
|---|---|---|---|---|---|
| ***(b)*** | Labour Rate Variance | = | (AH × SR) – (AH × AR) | | |
| | | = | (5,300 hours × ₹80) – ₹4,34,600 | = | ***₹10,600 A*** |
| | Labour Efficiency Variance | = | (SH × SR) – (AH × SR) | | |
| | | = | (1,000 units × 5 hours × ₹80) – (5,300 hours × ₹80) | | |
| | | = | ***₹24,000 A*** | | |

### *BQ 39*

The following information is available from the cost records of Novell & Co. for the month of March 2023:

| | |
|---|---|
| Materials purchased | 20,000 units @ ₹88,000 |
| Materials consumed | 19,000 units |
| Actual wages paid for 4,950 hrs | ₹24,750 |
| Units produced | 1,800 units |
| ***Standard rates and pieces are:*** | |
| Direct material | ₹4 per unit |
| Standard output | 10 number for one unit |
| Direct labour rate | ₹4.00 per hour |
| Standard requirement | 2.5 hours per unit |

***You are required to calculate relevant material (based on consumption) and labour variance for the month.***

### *Answer*

| | | | | | |
|---|---|---|---|---|---|
| ***(a)*** | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | | = | (1,800 units × 10 units × ₹4) – (19,000 units × ₹4.40*) | | |
| | | = | ₹72,000 – ₹83,600 | = | ***₹11,600 A*** |

| | | | | | |
|---|---|---|---|---|---|
| | *Actual Purchase Price (AP) | = | ₹88,000 ÷ 20,000 units | = | ***₹4.40*** |
| ***(b)*** | Material Price Variance | = | (SP – AP) × AQ | | |
| | | = | (₹4.00 - ₹4.40) × 19,000 units | = | ***₹7,600 A*** |
| ***(c)*** | Material Usage Variance | = | (SQ × SP) – (AQ × SP) | | |
| | | = | (1,800 units × 10 units × ₹4) – (19,000 units × ₹4.00) | | |
| | | = | ₹72,000 – ₹76,000 | = | ***₹4,000 A*** |
| ***(d)*** | Labour Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | | = | (1,800 units × 2.5 hrs × ₹4) – ₹24,750 | | |
| | | = | ₹18,000 – ₹24,750 | = | ***₹6,750 A*** |
| ***(e)*** | Labour Efficiency Variance | = | (SH × SR) – (AH × SR) | | |
| | | = | (1,800 units × 2.5 hrs × ₹4) – (4,950 hours × ₹4.00) | | |
| | | = | ₹18,000 – ₹19,800 | = | ***₹1,800 A*** |
| ***(f)*** | Labour Rate Variance | = | (SR – AR) × AH | | |
| | | = | (₹4.00 - ₹5.00) × 4,950 hours | = | ***₹4,950 A*** |
| | *Actual Rate (AR) | = | ₹24,750 ÷ 4,950 hours | = | ***₹5.00*** |

### *BQ 40*

ABC Ltd. had prepared the following estimation for the month of January:

| | ***Quantity*** | ***Rate (₹)*** | ***Amount (₹)*** |
|---|---|---|---|
| Material A | 800 kg. | 90.00 | 72,000 |
| Material B | 600 kg. | 60.00 | 36,000 |
| Skilled labour | 1,000 hours | 75.00 | 75,000 |
| Unskilled labour | 800 hours | 44.00 | 35,200 |

Normal loss was expected to be 10% of total input materials and an idle labour time of 5% of expected labour hours was also estimated.

At the end of the month the following information has been collected from the cost accounting department: The company has produced 1,480 kg. finished product by using the followings:

| | ***Quantity*** | ***Rate (₹)*** | ***Amount (₹)*** |
|---|---|---|---|
| Material A | 900 kg. | 86.00 | 77,400 |
| Material B | 650 kg. | 65.00 | 42,250 |
| Skilled labour | 1,200 hours | 71.00 | 85,200 |
| Unskilled labour | 860 hours | 46.00 | 39,560 |

***You are required to calculate:***

***(a)*** Material Cost Variance;
***(b)*** Material Price Variance;
***(c)*** Material Mix Variance;
***(d)*** Material Yield Variance;
***(e)*** Labour Cost Variance;
***(f)*** Labour Efficiency Variance and
***(g)*** Labour Yield Variance.

### *Answer*

| | | | | | |
|---|---|---|---|---|---|
| ***(a)*** | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | | = | ₹1,26,900 – ₹1,19,650 | = | ***₹7,250 F*** |
| ***(b)*** | Material Price Variance | = | (AQ × SP) – (AQ × AP) | | |
| | | = | ₹1,20,000 - ₹1,19,650 | = | ***₹350 F*** |

| | | | | | |
|---|---|---|---|---|---|
| *(c)* | Material Mix Variance | = | (RSQ × SP) – (AQ × SP) | | |
| | | = | ₹1,19580 – ₹1,20,000 | = | *₹420 A* |
| *(d)* | Material Yield Variance | = | (SQ × SP) – (RSQ × SP) | | |
| | | = | ₹1,26,900 - ₹1,19,580 | = | *₹7,320 F* |
| *(e)* | Labour Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | | = | ₹1,22,992 - ₹1,24,760 | = | *₹1,768 A* |
| *(f)* | Labour Efficiency Variance | = | (SH × SR) – (AH × SR) | | |
| | | = | ₹1,22,992 - ₹1,27,840 | = | *₹4,848 A* |
| *(g)* | Labour Yield Variance | = | (SH × SR) – (RSH × SR) | | |
| | | = | ₹1,22,992 - ₹1,26,104 | = | *₹3,112 A* |

***Working notes:***

***(1) Basic Calculations for Materials***

| Materials | SQ × SP | RSQ × SP | AQ × SP | AQ × AP |
|---|---|---|---|---|
| A | 940 × ₹90 | 886 × ₹90 | 900 × ₹90 | 900 × ₹86 |
| B | 705 × ₹60 | 664 × ₹60 | 650 × ₹60 | 650 × ₹65 |
| Total | ₹1,26,900 | ₹1,19,580 | ₹1,20,000 | ₹1,19,650 |

***(2) SQ of input for actual output of 1,480 kgs.:***

Total standard input of raw materials = 1,480 kg ÷ 90% = 1,645 kgs.

Materials A = 1,645 kgs. × 8/14 = 940 kgs
Materials B = 1,645 kgs. × 6/14 = 705 kgs

***(3) RSQ (Revised Standard Quantity) of actual input:***

Materials A = (900 + 650) × 8/14 = 886 kgs
Materials B = (900 + 650) × 6/14 = 664 kgs

***(4) Basic Calculations for Labour***

| Labour | SH × SR | RSH × SR | AH ×SR | AH ×AR |
|---|---|---|---|---|
| Skilled | 1,116 × 75 | 1,144 × 75 | 1,200 × 75 | 1,200 × 71 |
| Unskilled | 893 × 44 | 916 × 44 | 860 × 44 | 860 × 46 |
| Total | ₹1,22,992 | ₹1,26,104 | ₹1,27,840 | ₹1,24,760 |

***(5) RSH (Revised Standard hours):***

Skilled = (1,200 + 860) × 10/18 = 1,144 hours
Unskilled = (1,200 + 860) × 8/18 = 916 hours

***(6) SH (Standard hours) for 1,480 kg output:***

Estimated output = (800 kg + 600 kg) – 10% loss = 1,260 kg

Skilled = $\frac{\text{1,000 hours}-\text{5\% expected idle time}}{\text{1,260 kg}}$ × 1,480 kg = 1,116 hours

Unskilled = $\frac{\text{800 hours}-\text{5\% expected idle time}}{\text{1,260 kg}}$ × 1,480 kg = 893 hours

***BQ 41***

Paras Synthetics uses Standard costing system in manufacturing of its product 'Star 95 Mask'. The details are as follows;

Direct Material 0.50 Meter @ ₹60 per meter ₹30

| | |
|---|---|
| Direct Labour 1 hour @ ₹20 per hour | ₹20 |
| Variable overhead 1 hour @ ₹10 per hour | ₹10 |
| ***Total*** | ***₹60*** |

During the month of August, 2023 10,000 units of 'Star 95 Mask' were manufactured. Details are as follows:

| | |
|---|---|
| Direct material consumed 5,700 meters @ ₹58 per meter | |
| Direct labour Hours? @ ? | ₹2,24,400 |
| Variable overhead incurred | ₹1,12,200 |

Variable overhead efficiency variance is ₹ 2,000 A. Variable overheads are based on Direct Labour Hours.

***You are required to calculate the missing data and all the relevant Variances.***

***Answer***

***1. Material Variances:***

Material Cost Variance = (SQ × SP) – (AQ × AP)
= (10,000 units × 0.5 meter × ₹60) – (5,700 × ₹58)
= ***₹30,600 A***

Material Price Variance = (AQ × SP) – (AQ × AP)
= (5,700 × ₹60) – (5,700 × ₹58) = ***₹11,400 F***

Material Usage Variance = (SQ × SP) – (AQ × SP)
= (10,000 units × 0.5 meter × ₹60) - (5,700 × ₹60)
= ***₹42,000 A***

***2. Variable Overheads Variances:***

Variable OH Cost variance = (SH × SR) - (AH × AR)
= (10,000 × 1 hour × ₹10) – ₹1,12,200 = ***₹12,200 A***

Variable OH Eff. Variance = (SH × SR) - (AH × SR)
₹2,000 A = (10,000 × 1 hour × ₹10) - (AH × ₹10)
₹2,000 A = ₹1,00,000 – 10 AH

Actual Hours = ₹1,02,000 ÷ ₹10 = ***10,200 hours***
Variable OH Exp. Variance = (AH × SR) - (AH × AR)
= (10,200 × ₹10) - ₹1,12,200 = ***10,200 A***

***3. Labour Variances:***

Labour Rate Variance = (AH × SR) – (AH × AR)
= (10,200 hours × ₹20) – ₹2,24,400 = ***₹20,400 A***

Labour Efficiency Variance = (SH × SR) – (AH × SR)
= (10,000 units × 1 hour × ₹20) – (10,200 hours × ₹20)
= ***₹4,000 A***

Labour Cost Variance = (SH × SR) – (AH × AR)
= (10,000 units × 1 hour × ₹20) – ₹2,24,400
= ***₹24,400 A***

Actual Labour rate = Actual Labour Cost ÷ AH
= ₹2,24,400 ÷ 10,200 hours = ***₹22***

***BQ 42***

Mr. M provides the following information relating to 1,000 units of product 'ZED' during the month of April, 2023.

| | | |
|---|---|---|
| Standard price per kg of raw material | : | ₹3.00 |
| Actual total direct material cost | : | ₹10,000.00 |
| Standard direct labour hours | : | 1,600 |
| Actual direct labour hours | : | 1,800 |
| Total standard direct labour cost | : | ₹8,000.00 |
| Standard variable overhead per direct labour hour | : | ₹1.00 |
| Standard variable cost per unit of ZED | : | ₹1.60 |
| Total standard variable overheads | : | ₹1,600.00 |
| Actual total variable overheads | : | ₹1,620.00 |

The material usage variance is ₹600.00 (adverse) and the overall cost variance per unit of ZED is ₹0.07 (adverse) as compared to the total standard cost per unit of ZED of ₹21.00.

***You are required to compute the following:***

***(a)*** Standard quantity of raw material per unit of ZED.
***(b)*** Standard direct labour rate per hour.
***(c)*** Standard direct material cost per unit of ZED.
***(d)*** Standard direct labour cost per unit of ZED.
***(e)*** Standard total material cost for the output.
***(f)*** Actual total direct labour cost for the output.
***(g)*** Material price variance.
***(h)*** Labour rate variance.
***(i)*** Labour efficiency variance.
***(j)*** Variable overhead expenditure variance.
***(k)*** Variable overheads efficiency variance.

***[(a) 3.80 kg (b) ₹5.00 (c) ₹11.40 (d) ₹8.00 (e) ₹11,400 (f) ₹9,450 (g) 2,000 F (h) 450 A (i) 1,000 A (j) 180 F (k) 200 A]***

## *BQ 43*

Z Ltd. uses standard costing system in manufacturing of its single product 'M'. The standard cost per unit of M is as follows:

| | | |
|---|---|---|
| Direct Materials | 2 meters @ ₹6.00 per meter | ₹12.00 |
| Direct Labour | 1 hour @ ₹4.40 per hour | ₹4.40 |
| Variable OH | 1 hour @ ₹3 per hour | ₹3.00 |
| | | ***₹19.40*** |

During July 2023, 6000 units of M were produced and the related data are as under:

| | | |
|---|---|---|
| Direct material acquired | : | 19,000 meters @ ₹5.70 per meter |
| Material Consumed | : | 12,670 meters |
| Direct labour | : | ? hours @ ₹ ? per hour |
| Direct labour cost | : | ₹27,950 |
| Variable overheads incurred | : | ₹20,475 |

The variable overhead efficiency variance is ₹1,500 adverse. Variable overheads are based on direct labour hours. There was no stock of raw material in the beginning.

***You are required to compute the missing figures and work out all the relevant variance.***

***[6,500 hours @ ₹4.30 per hour, MCV 1,680 F, MPV 5,700 F, MYV 4,020 A, LCV 1,550 A, LRV 650 F, LEV 2,200 A, VOCV 2,475 A, VO Eff. V 1,500 A, VO Exp V 975 A]***

## *BQ 44*

ZED Ltd. has a standard costing system for its single output. Their standard cost for 100 units produced are as follows:

| ***Particulars*** | ***₹*** |
|---|---|
| Material 100 kg @ ₹10.00 | 1,000 |
| Labour 40 hours @ ₹20.00 per hour | 800 |

| | |
|---|---|
| Variable factory overhead 40 hours @ ₹10.00 | 400 |
| Fixed factory overhead 40 hours @ ₹5.00 | 200 |
| ***Total*** | ***2,400*** |

***The following operating data were taken for May 2023:***

- ***(a)*** 500 units were manufactured
- ***(b)*** Normal volume is 220 direct labour hours
- ***(c)*** 520 kg of material @ ₹11.00 were consumed
- ***(d)*** 190 labour hours @ ₹19.00 were used
- ***(e)*** Actual variable factory overhead ₹2,090
- ***(f)*** Actual fixed factory overhead ₹1,150

***You are required to calculate the different cost variances.***

***[MCV 720 A, MPV 520 A, MYV 200 A, LCV 390 F, LRV 190 F, LEV 200 F, VOCV 90 A, VO Exp V 190 A, VO Eff V 100 F, FOHCV 150 A, FOH Exp V 50 A, FOH Cap V 150 A, FOH Eff V 50 F, FOHVV 100 A]***

### BQ 45

***Following is the standard cost card of a component:***

| | | |
|---|---|---|
| Material | 2 Units at ₹15.00 | ₹30.00 |
| Labour | 3 Hours at ₹20.00 | ₹60.00 |
| Total overheads | 3 Hours at ₹10.00 | ₹30.00 |

During a particular month 10,000 units of the component were produced and the same was found to be at 60% capacity of the budget. In preparing the variance report for the month, the cost accountant gathered the following information:

| | | |
|---|---|---|
| Labour | : | ₹6,50,000 |
| Variable overhead | : | ₹2,00,000 |
| Fixed overheads | : | ₹3,00,000 |
| Material price variance | : | ₹70,000 A |
| Material cost variance | : | ₹50,000 A |
| Labour rate variance | : | ₹50,000 F |
| Fixed overhead expenditure variance | : | ₹50,000 A |

***You are required to prepare from the above details:***

- ***(i)*** Actual material cost incurred
- ***(ii)*** Standard cost of materials actually consumed
- ***(iii)*** Labour efficiency variance
- ***(iv)*** Variable OH efficiency variance
- ***(v)*** Variance OH expenditure variance
- ***(vi)*** Fixed OH efficiency variance
- ***(vii)*** Fixed OH capacity variance
- ***(viii)*** Fixed OH volume variance

***[(i) ₹3,50,000 (ii) ₹2,80,000 (iii) ₹1,00,000 A (iv) 25,000 A (v) 25,000 A (vi) 25,000 A (vii) 75,000 A (viii) 1,00,000 A]***

### BQ 46

Tricon Co. furnishes the following information for the month of September, 2023:

| ***Particulars*** | ***Budget details*** | ***Static budget*** | ***Actual*** |
|---|---|---|---|
| Units produced & sold | | 4,000 | 3,200 |
| Direct Material | 3 kg p.u. @ ₹30 per kg | 3,60,000 | 3,10,000 |
| Direct Labour | 1 hour p. u. @ ₹72 per hour | 2,88,000 | 2,25,600 |
| Variable Overheads | 1 hour p. u. @ ₹44 per hour | 1,76,000 | 1,47,200 |
| Fixed Overheads | | 1,80,000 | 1,68,000 |

| | | | |
|---|---|---|---|
| Total Cost | | 10,04,000 | 8,50,800 |
| Sales | | 12,00,000 | 8,96,000 |
| Profit | | 1,96,000 | 45,200 |

During the month 10,000 kg. of materials and 3,100 direct labour hours were utilized.

***Required:***

***(1)*** Prepare a flexible budget for the month.

***(2)*** Determine the material usage variance and the direct labour rate variance for the actual vs the flexible budget.

## *Answer*

### *(1) Statement Showing Flexible Budget for 3,200 units Activity Level*

| ***Particulars*** | ***Amount (in ₹)*** |
|---|---|
| Direct Material (3,200 units × 3 kg × ₹30 per kg) | 2,88,000 |
| Direct Labour (3,200 units × 1 hour × ₹72 per hour) | 2,30,400 |
| Variable Overheads (3,200 units × 1 hour × ₹44 per hour) | 1,40,800 |
| Fixed Overheads | 1,80,000 |
| ***Total Cost*** | 8,39,200 |
| Add: Profit (b.f.) | 1,20,800 |
| ***Sales [(₹12,00,000 ÷ 4,000) × 3,200]*** | ***9,60,000*** |

***(2)*** ***Computation of Variances:***

Material Usage Variance = (SQ × SP) – (AQ × SP)
= ₹2,88,000 – (10,000 kg × ₹30) = ***₹12,000 A***

Labour Rate Variance = (AH × SR) – (AH × AR)
= (3,100 hours × ₹72) – ₹2,25,600 = ***₹2,400 A***

## *BQ 47*

Aaradhya Ltd. manufactures a commercial product for which the standard cost per unit as follows:

| | |
|---|---|
| Material (5 kg @ ₹4 per kg) | ₹20.00 |
| Labour (3 hours @ ₹10 per hour) | ₹30.00 |
| Overheads: | |
| Variable (3 hours @ ₹1 per hour) | ₹3.00 |
| Fixed (3 hours @ ₹0.50 per hour) | ₹1.50 |
| ***Total*** | ***₹54.50*** |

During January 2023, 600 units of the product were manufactured at the cost shown below:

| | |
|---|---|
| Material purchased (5,000 kg @ ₹4.10 per kg) | ₹20,500 |
| Material used: 3,500 kg | |
| Labour (1,700 hours @ ₹9 per hour) | ₹15,300 |
| Variable Overheads | ₹1,900 |
| Fixed Overheads | ₹900 |
| ***Total*** | ***₹38,600*** |

The flexible budget required 1,800 direct labour hours for operation at the monthly activity level used to set the fixed overhead rate.

***Compute:***

***(a)*** Material price variance,

***(b)*** Material usage variance

***(c)*** Labour rate variance

***(d)*** Labour efficiency variance

*(e)* Variable overhead expenditure variance
*(f)* Variable overhead efficiency variance
*(g)* Fixed overhead expenditure variance
*(h)* Fixed overhead volume variance
*(i)* Fixed overhead capacity variance
*(j)* Fixed overhead efficiency variance
*(k)* Reconcile the standard and actual cost of production

### Answer

*(a)* Material Price Variance = (SP – AP) × Actual quantity purchased
= (₹4.00 – ₹4.10) × 5,000 kg = ***₹500 A***

*(b)* Material Usage Variance = (SQ – AQ) × SP
= (600 units × 5 kg. - 3,500 kg) × ₹4 = ***₹2,000 A***

*(c)* Labour Rate Variance = (SR – AR) × AH
= (₹10 – ₹9) × 1,700 hours = ***₹1,700 F***

*(d)* Labour Efficiency Variance = (SH – AH) × SR
= (600 units × 3 hours – 1,700 hours) × ₹10 = ***₹1,000 F***

*(e)* Variable OH Exp. Variance = (AH × SR) - (AH × AR)
= (1,700 hours × ₹1) - ₹1,900 = ***₹200 A***

*(f)* Variable OH Eff. Variance = (SH – AH) × SR
= (600 units × 3 hours – 1,700 hours) × ₹1 = ***₹100 F***

*(g)* Fixed OH Exp. Variance = Budgeted Overheads - Actual Overheads
= (1,800 hours × ₹0.5) - ₹900 = ***Nil***

*(h)* Fixed OH Volume Variance = Absorbed Overheads – Budgeted Overheads
= (600 units × 3 hours × ₹0.5) - ₹900 = ***Nil***

*(i)* Fixed OH Capacity Variance = (AH × SR) – (BH × SR)
= (1,700 hours × ₹0.5) - ₹900 = ***₹50 A***

*(j)* Fixed OH Efficiency Variance = (SH × SR) – (AH × SR)
= (600 units × 3 hours × ₹0.5) - (1,700 hours × ₹0.5)
= ***₹50 F***

***(k) Reconciliation Statement***

| ***Particulars*** | ***Amount*** | ***Amount*** |
|---|---|---|
| Standard Cost (600 units × ₹54.50) | | 32,700 |
| Less: Actual Cost of Production: | | |
| Actual Cost Incurred | 38,600 | |
| Less: Closing Stock of Material at Standard Cost (1,500 × ₹4.00) | (6,000) | (32,600) |
| ***Variance or Difference in Cost*** | | ***100 F*** |
| ***Variance:*** | | |
| Material Price | | 500 A |
| Material Usage | | 2,000 A |
| Labour Rate | | 1,700 F |
| Labour Efficiency | | 1,000 F |
| Variable Overhead Expenditure | | 200 A |
| Variable Overhead Efficiency | | 100 F |
| Fixed Overhead Expenditure | | Nil |
| Fixed Overhead Volume | | Nil |
| ***Variance*** | | ***100 F*** |

## BUDGET RATIOS

### BQ 48

Following data is available for DKG and Co:

| | |
|---|---|
| Standard working hours | 8 hours per day of 5 days per week |
| Maximum capacity | 50 employees |
| Actual working | 40 employees |
| Actual hours expected to be worked per four week | 6,400 hours |
| Standard hours expected to be earned per four weeks | 8,000 hours |
| Actual hours worked in the four week period | 6,000 hours |
| Standard hours earned in the four week period | 7,000 hours. |

The related period is of 4 weeks. In this period there was a one special day holiday due to national event.

***Calculate (1)*** Efficiency Ratio, ***(2)*** Activity Ratio, ***(3)*** Calendar Ratio, ***(4)*** Standard Capacity Usage Ratio, ***(5)*** Actual Capacity Usage Ratio, ***(6)*** Actual Usage of Budgeted Capacity Ratio.

### Answer

Maximum Capacity in a budget period = 50 Employees × 8 Hours × 5 Days × 4 Weeks = ***8,000 Hours***

Budgeted Hours = 40 Employees × 8 Hours × 5 Days × 4 Weeks = ***6,400 Hours***

Actual Hours = ***6,000 Hours (given)***

Standard Hours for Actual Output = ***7,000 Hours***

Budget Number of Days = ***20 Days (4 Weeks x 5 Days)***

Actual Number of Days = 20 – 1 = ***19 Days***

***(1)*** Efficiency Ratio $= \frac{\text{Standard Hours}}{\text{Actual Hours}} \times 100 = \frac{7{,}000 \text{ Hours}}{6{,}000 \text{ Hours}} \times 100$

= ***116.67%***

***(2)*** Activity Ratio $= \frac{\text{Standard Hours}}{\text{Budgeted Hours}} \times 100 = \frac{7{,}000 \text{ Hours}}{6{,}400 \text{ Hours}} \times 100$

= ***109.375%***

***(3)*** Calendar Ratio $= \frac{\text{Available Working Days}}{\text{Budgeted Working Days}} = \frac{19 \text{ Days}}{20 \text{ Days}}$

= ***95%***

***(4)*** Standard Capacity Usage Ratio $= \frac{\text{Budgeted Hours}}{\text{Max. Possible Hours in Budget Period}} \times 100$

$= \frac{6{,}400 \text{ Hours}}{8{,}000 \text{ Hours}} \times 100$ = ***80%***

***(5)*** Actual Capacity Usage Ratio $= \frac{\text{Actual Hours Worked}}{\text{Max. Possible Working Hours in a Period}} \times 100$

$= \frac{6{,}000 \text{ Hours}}{8{,}000 \text{ Hours}} \times 100$ = ***75%***

***(6)*** Actual Usage of Budgeted Capacity Ratio $= \frac{\text{Actual Working Hours}}{\text{Budgeted Hours}} \times 100$

$= \frac{6{,}000 \text{ Hours}}{6{,}400 \text{ Hours}} \times 100$ = ***93.75%***

# PAST YEAR QUESTIONS

## PYQ 1

KPR Limited operates a system of standard costing in respect of one of its product which is manufactured within single cost centre.

***The Standard Cost Card of a product is as under:***

| | | Unit cost (₹) |
|---|---|---|
| Direct Material | 5 kg @ ₹4.20 | 21.00 |
| Direct labour | 3 hours @ ₹3.00 | 9.00 |
| Factory overhead | ₹1.20 per labour hour | 3.60 |
| ***Total manufacturing cost*** | | ***33.60*** |

The production schedule for the month of June, 2007 required completion of 40,000 units. However 40,960 units were completed during the month without opening and closing work-in-process inventories. Purchases during the month of June 2007, 2,25,000 kg of material at the rate of ₹4.50 per kg.
Production and Sales records for the month showed the following actual results.

| | |
|---|---|
| Material used | 2,05,600 kg |
| Direct labour | 1,21,200 hours |
| Labour cost incurred | ₹3,87,840 |
| Total factory overhead cost incurred | ₹1,00,000 |
| Sales | 40,000 units |

Selling price to be so fixed as to allow a mark-up of 20 percent on selling price.

***Required:***

***(i)*** Calculate material variances based on consumption of material.
***(ii)*** Calculate labour variances and the total variance for factory overhead.
***(iii)*** Prepare Income statement for June, 2007 showing actual gross margin.
***(iv)*** An incentive scheme is in operation in the company whereby employees are paid a bonus of 50% of direct labour hour saved at standard direct labour hour rate. Calculate the Bonus amount.

***[(15 Marks) Nov 2007]***

### Answer

***(i) Material Variances:***

Material Cost Variance = (SQ × SP) – (AQ × AP)
= (40,960 units × 5 kgs. × ₹4.20) – (2,05,600 kgs. × ₹4.50)
= ***65,040 A***

Material Price Variance (based on consumption) = (AQ × SP) – (AQ × AP)
= (2,05,600 kgs. × ₹4.20) – (2,05,600 kgs. × ₹4.50)
= ***61,680 A***

Material Usage Variance = (SQ × SP) - (AQ × SP)
= (40,960 units × 5 kgs. × ₹4.20) - (2,05,600 kgs. × ₹4.20)
= ***3,360 A***

***(ii) Labour Variances:***

Labour Cost Variance = (SH × SR) – (AH × AR)
= (40,960 × 3 hours × ₹3.00) – (₹3,87,840) = ***19,200 A***

Labour Rate Variance = (AH × SR) – (AH × AR)
= (1,21,200 hours × ₹3.00) - (₹3,87,840) = ***24,240 A***

Labour Efficiency Variance = (SH × SR) – (AH × SR)
= (40,960 × 3 hours × ₹3.00) - (1,21,200 hours × ₹3.00)
= 3,63,600 - 3,68,640 = ***5,040 F***

Overhead Total Variance = (SH × SR) – (AH × AR)
= (40,960 × 3 hours × ₹1.20) – (₹1,00,000) = ***47,456 F***

### *(iii) Statement of Income*

| Particulars | | ₹ |
|---|---|---|
| Sales | (40,000 units × ₹42) | 16,80,000 |
| Less: Standard COGS | (40,000 units × ₹33.60) | (13,44,000) |
| ***Standard Gross Margin*** | | 3,36,000 |
| ***Less : Adverse Variances:*** | | |
| Materials Price Variance | | (61,680) |
| Materials Usage Variance | | (3,360) |
| Labour Rate Variance | | (24,240) |
| ***Add : Favourable Variances:*** | | |
| Labour Efficiency Variance | | 5,040 |
| Overhead Variance | | 47,456 |
| ***Actual Gross Margin*** | | ***2,99,216*** |

***(iv) Bonus*** = 50% of time saved × Standard direct labour rate
= 50% (SH – AH) × ₹3 = 50% (1,22,880 – 1,21,200) × ₹3 = ***2,520***

****SH*** = 40,960 units × 3 hours = ***1,22,880 hours***

## *PYQ 2*

***Calculate Efficiency and Capacity ratio from the following figures:***

| | |
|---|---|
| Budgeted production | 80 units |
| Actual production | 60 units |
| Standard time per unit | 8 hours |
| Actual hours worked | 500 |

***[(2 Marks) Nov 2007]***

### *Answer*

***Efficiency ratio*** $= \dfrac{\text{Standard hours for actual prodcution}}{\text{Actual hours worked}} \times 100 = \dfrac{480 \text{ hours}}{500 \text{ hours}} \times 100$

= ***96%***

***Capacity Ratio*** $= \dfrac{\text{Actual hours worked}}{\text{Budgeted hours}} \times 100 = \dfrac{500 \text{ hours}}{640 \text{ hours}} \times 100$

= ***78.125%***

***Workings:***

SH for actual Production = 60 units × 8 hours = ***480 hours***

Budgeted hours = 80 units × 8 hours = ***640 hours***

## *PYQ 3*

TQM Ltd. has furnished the following information for the month ending 30th June, 2007:

| | ***Master Budget*** | ***Actual*** | ***Variance*** |
|---|---|---|---|
| Units produced and sold | ***80,000*** | ***72,000*** | |
| Sales (₹) | ***3,20,000*** | ***2,80,000*** | 40,000 (A) |
| Direct material (₹) | 80,000 | 73,600 | 6,400 (F) |
| Direct wages (₹) | 1,20,000 | 1,04,800 | 15,200 (F) |
| Variable overhead (₹) | 40,000 | 37,600 | 2,400 (F) |
| Fixed overhead (₹) | 40,000 | 39,200 | 800 (F) |
| Total Cost | ***2,80,000*** | ***2,55,200*** | |

***The Standard costs of the products are as follows:***

| | | |
|---|---|---|
| Direct materials | (1 kg at the rate of ₹1 per kg) | ₹1.00 |
| Direct wages | (1 hour at the rate of ₹1.50) | ₹1.50 |
| Variable overhead | (1 hour at the rate of ₹0.50) | ₹0.50 |

Actual results for the month showed that 78,400 kg of material were used and 70,400 labour hours were recorded.

***Required:***

***(i)*** Prepare Flexible budget for the month and compare with actual results.

***(ii)*** Calculate Material, Labour, Sales Price, Variable overhead and Fixed overhead expenditure variances and Sales Volume (Profit) variance.

***[(15 Marks) May 2008]***

## *Answer*

### *(i) Flexible Budget*

| *Particulars* | *Budget for 72,000 units* | *Actual for 72,000 units* | *Difference* |
|---|---|---|---|
| Direct Materials | 72,000 | 73,600 | 1,600 A |
| Direct Labour | 1,08,000 | 1,04,800 | 3,200 F |
| Variable OH | 36,000 | 37,600 | 1,600 A |
| Fixed OH | 40,000 | 39,200 | 800 F |
| Total cost | 2,56,000 | 2,55,200 | 800 F |
| Sales | 2,88,000 | 2,80,000 | 8,000 A |
| ***Profit*** | ***32,000*** | ***24,800*** | ***7,200 A*** |

### *(ii) Calculation of Various Variance:*

***(a) Material Variance :***

| | | | | |
|---|---|---|---|---|
| Material Price Variance | = | (AQ × SP) - (AQ × AP) | | |
| | = | (78,400 kg × ₹1.00) – 73,600 (given) | = | ***4,800 F*** |
| Material Usage Variance | = | (SQ × SP) - (AQ × SP) | | |
| | = | (72,000 kg × ₹1.00) – (78,400 kg × ₹1.00) | = | ***6,400 A*** |
| Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | = | 72,000 - 73,600 | = | ***1,600 A*** |

***(b) Labour Variance :***

| | | | | |
|---|---|---|---|---|
| Labour Rate Variance | = | (AH × SR) – (AH × AR) | | |
| | = | (70,400 hours × ₹1.5) - 1,04,800 (given) | = | ***800 F*** |
| Labour Efficiency Variance | = | (SH × SR) – (AH × SR) | | |
| | = | (72,000 hours × ₹1.5) – (70,400 hours × ₹1.5) | = | ***2,400 F*** |
| Labour Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | = | (72,000 hours × ₹1.5) - 1,04,800 | = | ***3,200 F*** |

***(c) Overhead Expenditure Variance :***

| | | | | |
|---|---|---|---|---|
| Variable OH Exp. Variance | = | (AH × SR) – (AH × AR) | | |
| | = | (70,400 hours × ₹0.50) – 37,600 (given) | = | ***2,400 A*** |
| Fixed OH Exp. Variance | = | Budgeted Fixed OH – Actual Fixed OH | | |
| | = | 40,000 - 39,200 (given) | = | ***800 F*** |

***(d) Sales Variance :***

| | | | | |
|---|---|---|---|---|
| Sales Price Variance | = | (AQ × Standard Sales Price) – (AQ × Actual Sales Price) | | |
| | = | (72,000 units × ₹4) – 2,80,000(given) | = | ***8,000 A*** |

| | | | | |
|---|---|---|---|---|
| Sales Vol. (Profit) Variance | = | Standard Profit per unit (Budgeted Quantity – Actual Quantity) | | |
| | = | ₹0.50 × (80,000 – 72,000) | = | ***4,000 A*** |

### *PYQ 4*

UV Ltd. presents the following information for November 2008:

| | | |
|---|---|---|
| Budgeted production of product P | = | 200 units. |
| Standard consumption of Raw materials | = | 2 kg per unit of P. |
| Standard price of material A | = | ₹6 per kg. |

Actually, 250 units of P were produced and material A was purchased at ₹8 per kg and consumed at 1.8 kg per unit of P.

***Calculate the material variances.***

***[(3 Marks) Nov 2008]***

### *Answer*

| | | | | |
|---|---|---|---|---|
| Material Cost Variance | = | (SQ × SP) - (AQ × AP) | | |
| | = | (250 units × 2 kg × ₹6) - (250 units × 1.8 kg × ₹8) | = | ***600 A*** |
| Material Usage Variance | = | (SQ × SP) - (AQ × SP) | | |
| | = | (250 units × 2 kg × ₹6) - (250 units × 1.8 kg × ₹6) | = | ***300 F*** |
| Material Price Variance | = | (AQ × SP) - (AQ × AP) | | |
| | = | (250 units × 1.8 kg × ₹6) - (250 units × 1.8 kg × ₹8) | = | ***900 A*** |

### *PYQ 5*

Following details relating to product X during the month of April, 2009 are available:

| | | |
|---|---|---|
| Standard materials cost per unit of X | : | Materials 50 kg @ ₹40.00 per kg |
| Actual production | : | 100 units |
| Actual material cost | : | ₹42.00 per kg |
| Material price variance | : | ₹9,800 (Adverse) |
| Material usage variance | : | ₹4,000 (Favourable). |

***Calculate the actual quantity of material used during the month April, 2009.***

***[(2 Marks) May 2009]***

### *Answer*

| | | | | |
|---|---|---|---|---|
| Material price variance | = | (AQ × SP) - (AQ × AP) | = | AQ (SP - AP) |
| -9,800 | = | AQ (40 - 42) | = | - 2 AQ |
| ***AQ*** | = | 9,800 ÷ 2 | = | ***4,900 kg*** |

### *PYQ 6*

The following information is available from the cost records of Vatika & Company for the month of August, 2009:

| | | |
|---|---|---|
| Material purchased | : | ₹1,05,600 for 24,000 kg |
| Material consumed | : | 22,800 kg |
| Actual wages paid | : | ₹29,700 for 5,940 hours |
| Unit produced | : | 2,160 units |

***Standard rates and prices are:***

| | | |
|---|---|---|
| Direct material rate | : | ₹4.00 per kg |
| Direct labour rate | : | ₹4.00 per hour |
| Standard input | : | 10 kg for one unit. |
| Standard requirement | : | 2.5 hours per unit. |

***Calculate all material and labour variances for the month of August, 2009.*** ***[(8 Marks) Nov 2009]***

**Answer**

**(a) Material Variance:**

| | | | | |
|---|---|---|---|---|
| Material Price Variance | = | (AQP × SP) - (AQP × AP) | | |
| (based on purchase) | = | (24,000 kg × 4.00) – 1,05,600 | = | **9,600 A** |
| Material Usage Variance | = | (SQ × SP) - (AQ × SP) | | |
| | = | (2,160 × 10 kg × ₹4.00) - (22,800 kg × ₹4.00) | = | **4,800 A** |
| Material Cost Variance | = | MUV + MPV | | |
| | = | 9,600 A + 4,800 A | = | **14,400 A** |

**(b) Labour Variance :**

| | | | | |
|---|---|---|---|---|
| Labour Rate Variance | = | (AH × SR) – (AH × AR) | | |
| | = | (5,940 hours × ₹4.00) - 29,700 (given) | = | **5,940 A** |
| Labour Efficiency Variance | = | (SH × SR) – (AH × SR) | | |
| | = | (2,160 × 2.5 hours × ₹4.00) – (5,940 hours × ₹4.00) | | |
| | = | **2,160 A** | | |
| Labour Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | = | (2,160 × 2.5 hours × ₹4.00) – 29,700 | = | **8,100 A** |

## PYQ 7

***Calculate efficiency and activity ratio from the following data:***

| | |
|---|---|
| Capacity ratio | 75% |
| Budgeted output | 6,000 units |
| Actual output | 5,000 units |
| Standard Time per unit | 4 hours |

**[(2 Marks Nov) 2009]**

**Answer**

***Efficiency Ratio*** $= \dfrac{\text{Actual output in terms of standard hours}}{\text{Actual working hours}} \times 100$

$= \dfrac{5{,}000 \text{ units} \times 4 \text{ hours per unit}}{18{,}000 \text{ hours}} \times 100 = \dfrac{20{,}000 \text{ hours}}{18{,}000 \text{ hours}} \times 100$

$=$ **111.11%**

***Activity Ratio*** = Capacity ratio × Efficiency Ratio

= 75% × 111.11% = **83.33%**

**Working:**

***Capacity Ratio*** $= \dfrac{\text{Actual hours}}{\text{Budgeted hours}} \times 100$

$75\% = \dfrac{AH}{6{,}000 \text{ units} \times 4 \text{ hours per unit}} = \dfrac{AH}{24{,}000 \text{ hours}}$

***AH*** = **18,000 hours**

## PYQ 8

Gama Ltd. has furnished the following standard cost data per unit of production:

| | |
|---|---|
| Material | 10 kg @ ₹10 per kg |
| Labour | 6 hours @ ₹5.50 per hour |
| Variable overhead | 6 hours @ ₹10 per hour |
| Fixed overhead | ₹4,50,000 per month |

(Based on a normal volume of 30,000 labour hours)

The actual cost data for the month of August 2011 are as following:

| | |
|---|---|
| Material used | 50,000 kg at a cost of ₹5,25,000 |
| Labour paid | ₹1,55,000 for 31,000 hours worked. |
| Variable overheads | ₹2,93,000 |
| Fixed overhead | ₹4,70,000 |
| Actual production | 4,800 units |

***Calculate:***

***(i)*** Material cost variance, ***(ii)*** Labour cost variance, ***(iii)*** Fixed overhead cost variance, ***(iv)*** Variable overhead cost variance.

***[(8 marks) Nov 2011]***

### *Answer*

***(i)*** Material Cost Variance = (SQ × SP) – (AQ × AP)
= (4,800 units × 10 kg × ₹10) – 5,25,000 = ***45,000 A***

***(ii)*** Labour Cost Variance = (SH × SR) – (AH × AR)
= (4,800 units × 6 hours × ₹5.50) – 1,55,000 = ***3,400 F***

***(iii)*** Fixed OH Cost Variance = (SH × SR) – (AH × AR)
= (4,800 units × 6 hours × ₹15) – 4,70,000 = ***38,000 A***

$$^{*}SR = \frac{\text{Budgeted OH}}{\text{Budgeted hours}} = \frac{4{,}50{,}000}{30{,}000} = ₹15$$

***(iv)*** Variable OH Cost Variance = (SH × SR) – (AH × AR)
= (4,800 units × 6 hours × ₹10) – 2,93,000 = ***5,000 A***

### *PYQ 9*

SJ Ltd. has furnished the following information:

| | |
|---|---|
| Standard overhead absorption rate per unit | ₹20 |
| Standard rate per hour | ₹4 |
| Budgeted production | 12,000 units |
| Actual production | 15,560 units |
| Actual overheads were | ₹2,95,000 (₹62,500 fixed) |
| Actual hours | 74,000 |

***Overheads are based on the following flexible budget:***

| | | | |
|---|---|---|---|
| Production (units) | 8,000 | 10,000 | 14,000 |
| Total Overheads (₹) | 1,80,000 | 2,10,000 | 2,70,000 |

***You are required to calculate the following overhead variances (on hour's basis) with appropriate workings:***

***(i)*** Variable overhead efficiency and expenditure variance.

***(ii)*** Fixed overhead efficiency and capacity variance.

***[(8 Marks) May 2012/2015]***

### *Answer*

***(i)*** Variable Overhead Efficiency = (SH × SR) - (AH × SR)
= 2,33,400 - 2,22,000 = ***11,400 F***

Variable Expenditure Variable = (AH × SR) - (AH × AR)
= 2,22,000 - 2,35,500 = ***10,500 A***

***(ii)*** Fixed Overhead Efficiency = (SH × SR) - (AH × SR)
= 77,800 – 74,000 = ***3,800 F***

Fixed OH Capacity Variance = (AH × SR) - (BH × SR)

= 74,000 - 60,000 = ***14,000 F***

***Working Notes:***

***For variable overheads:***

SH × SR = 15,560 units × 5 hours per unit × ₹3 per hour
= ***2,33,400***

AH × SR = 74,000 hours × ₹3 per hour = ***2,22,000***

AH × AR = 2,95,000 - 62,500 = ***2,32,500***

***For fixed overheads:***

SH × SR = 15,560 units × 5 hours × ₹1 per hour = ***77,800***

AH × SR = 74,000 × ₹1 per hour = ***74,000***

BH × BR = 12,000 units × 5 hours per unit × ₹1 per hour
= ***60,000***

Standard OH (variable + fixed) = ***₹20 per unit***

Standard hours per unit = $\frac{\text{Standard overhead per unit}}{\text{Standard rate per hour}} = \frac{20.00}{4.00}$
= ***5 hours per unit***

Budgeted variable cost per unit = $\frac{\text{Difference in expense}}{\text{Difference in units}} = \frac{2,10,000 - 1,80,000}{10,000 - 8,000}$
= ***₹15.00 per unit***

Standard variable overhead per hour = $\frac{15.00}{5 \text{ hours}}$ = ***₹3 per hour***

Standard fixed overhead per hour = Total Standard OH per hour – Standard Variable OH per hour
= 4.00 - 3.00 = ***₹1 per hour***

***PYQ 10***

The standard labour employment and the actual labour engaged in a 40 hours week for a job are as under:

| *Category of workers* | *Standard* | | *Actual* | |
|---|---|---|---|---|
| | *No. of workers* | *Wage rate per hour ₹* | *No. of Workers* | *Wage rate per hour ₹* |
| Skilled | 65 | 45 | 50 | 50 |
| Semi- skilled | 20 | 30 | 30 | 35 |
| Unskilled | 15 | 15 | 20 | 10 |

Standard output : 2,000 units
Actual output : 1,800 units
Abnormal Idle Time : 2 hours in the week.

***Calculate:***

*(i)* Labour Cost Variance
*(ii)* Labour Efficiency Variance
*(iii)* Labour Idle Time Variance

***[(6 Marks) Nov 2012]***

***Answer***

*(i)* Labour Cost Variance = (SH × SR) – (AH × AR)
= 1,35,000 – 1,50,000 = ***15,000 A***

*(ii)* Labour Efficiency Variance = (SH × SR) – (AHW × SR)
= 1,35,000 – 1,31,100 = ***3,900 F***

*(iii)* Labour Idle Time Variance = (AHW × SR) – (AH × SR)
= 1,31,100 – 1,38,000 = **6,900 A**

**Working Notes:**

**Basic Calculations**

| Category of workers | SH × SR | AHW × SR | AH ×SR | AH ×AR |
|---|---|---|---|---|
| Skilled | $3,600 \times {}^{65}/_{100} \times 45$ | 50 × 38 × 45 | 50 × 40 × 45 | 50 × 40 × 50 |
| Semi Skilled | $3,600 \times {}^{20}/_{100} \times 30$ | 30 × 38 × 30 | 30 × 40 × 30 | 30 × 40 × 35 |
| Unskilled | $3,600 \times {}^{15}/_{100} \times 15$ | 20 × 38 × 15 | 20 × 40 × 15 | 20 × 40 × 10 |
| **Total** | **1,35,000** | **1,31,100** | **1,38,000** | **1,50,000** |

Total Standard time for 2,000 units = (65 + 20 +15) workers × 40 hrs = **4,000 hours**

Standard hours for 1,800 units = $\frac{4,000 \text{ hrs}}{2,000 \text{ units}} \times 1,800$ units = **3,600 hours**

## PYQ 11

Following are the details of the product Phomex for the month of April 2013:

| | | |
|---|---|---|
| Standard quantity of material required per unit | : | 5kg |
| Actual output | : | 1,000 units |
| Actual cost of materials used | : | ₹7,14,000 |
| Material price variance | : | ₹51,000 F |

Actual price per kg of material is found to be less than standard price per kg of material by ₹10

**You are required to calculate:**

*(i)* Actual quantity and Actual price of materials used
*(ii)* Material Usage Variance
*(iii)* Material Cost Variance

**[(5 Marks) May 2013]**

## Answer

***(i) Calculation of Actual quantity:***

Materials Price Variance = (AQ × SP) – (AQ × AP)
AQ × (SP - AP) = AQ × 10 (given) = 51,000
AQ = **5,100 kg**

***Calculation of Actual price:***

Actual price = $\frac{\text{Actual Material Cost}}{\text{Actual Quantity}} = \frac{7,14,000}{5,100 \text{ kg}}$ = **₹140 per kg**

***(ii) Materials Usage Variance*** = (SQ × SP) - (AQ × SP)
= (1,000 units × 5 kg × ₹150) – (5,100 kg × ₹150)
= 7,50,000 - 7,65,000 = **15,000 A**

***SP** = AP + ₹10 = ₹140 + ₹10 = **₹150 per kg**

***(iii) Material Cost Variance*** = MUV + MPV
= 15,000 A + 51,000 F = **36,000 F**

## PYQ 12

SP Limited produces a product 'Tempex' which is sold in a 10 kg packet. The standard cost card per packet of 'Tempex' are as follows:

| | |
|---|---|
| Direct material 10 kg @ ₹45 per kg | ₹450 |
| Direct labour 8 hours @ ₹50 per hour | ₹400 |

| | |
|---|---|
| Variable overhead 8 hours @ 10 per hour | ₹80 |
| Fixed overhead | ₹200 |
| | ***₹1,130*** |

Budgeted output for the third quarter of a year was 10,000 kg. Actual output is 9,000 kg. Actual cost for this quarter are as follows:

| | |
|---|---|
| Direct materials 8,900 kg @ ₹46 per kg | ₹4,09,400 |
| Direct labour 7,000 hours @ ₹52 per hour | ₹3,64,000 |
| Variable overhead incurred | ₹72,500 |
| Fixed overhead incurred | ₹1,92,000 |

***You are required to calculate:***

***(a)*** Material Usage Variance
***(b)*** Material Price Variance
***(c)*** Material Cost Variance
***(d)*** Labour Efficiency Variance
***(e)*** Labour Rate Variance
***(f)*** Labour Cost Variance
***(g)*** Variable Overhead Cost Variance
***(h)*** Fixed Overhead Cost Variance

***[(8 Marks) Nov 2013]***

***Answer***

| | | | | | |
|---|---|---|---|---|---|
| ***(a)*** | Material Usage Variance | = | (SQ × SP) - (AQ × SP) | | |
| | | = | (9,000 kg × ₹45) - (8,900 kg × ₹45) | | |
| | | = | ₹4,05,000 – ₹4,00,500 | = | ***4,500 F*** |
| ***(b)*** | Material Price Variance | = | (AQ × SP) – (AQ × AP) | | |
| | | = | (8,900 kg × ₹45) – (8,900 kg × ₹46) | | |
| | | = | ₹4,00,500 – ₹4,09,400 | = | ***8,900 A*** |
| ***(c)*** | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | | = | (9,000 kg × ₹45) – (8,900 kg × ₹46) | | |
| | | = | ₹4,05,000 – ₹4,09,400 | = | ***4,400 A*** |
| ***(d)*** | Labour Efficiency Variance | = | (SH × SR) – (AH × SR) | | |
| | | = | (9,000 kg× $^{8\text{ hrs}}/_{10\text{ kg}}$ × ₹50) - (7,000 hrs × ₹50) | | |
| | | = | ₹3,60,000 - ₹3,50,000 | = | ***10,000 F*** |
| ***(e)*** | Labour Rate Variance | = | (AH × SR) – (AH × AR) | | |
| | | = | ₹3,50,000 – ₹3,64,000 | = | ***14,000 A*** |
| ***(f)*** | Labour Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | | = | ₹3,60,000 – ₹3,64,000 | = | ***4,000 A*** |
| ***(g)*** | Variable OH Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | | = | (9,000 kg × $^{8\text{ hours}}/_{10\text{ kg}}$ × ₹10) – ₹72,500 | = | ***500 A*** |
| ***(h)*** | Fixed OH Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | | = | (9,000 kg × $^{1}/_{10\text{ kg}}$ × ₹200) – ₹1,92,000 | = | ***12,000 A*** |

***PYQ 13***

XYZ Co. Ltd. provides the following information:

| ***Particulars*** | ***Standard*** | ***Actual*** |
|---|---|---|

| | | |
|---|---|---|
| Production in units | 4,000 | 3,800 |
| Working Days | 20 | 21 |
| Fixed Overhead | ₹40,000 | ₹39,000 |
| Variable Overhead | ₹12,000 | ₹12,000 |

***You are required to calculate the following overhead variance:***

*(a)* Variable Overhead Variance
*(b)* Fixed Overheads Variances
 *(i)* Expenditure Variance
 *(ii)* Volume Variance

***[(8 Marks) May 2014]***

## Answer

***(a) Variable Overhead Variance*** = Standard Variable OH for 3,800 units – Actual Variable OH
= (Actual production × SR) – 12,000
= (3,800 units × 3) – 12,000 = ***600 A***

***(b) Fixed Overhead Variances:***

***(i) Expenditure Variance*** = Budgeted Fixed OH – Actual Fixed OH
= 40,000 – 39,000 = ***1,000 F***

***(ii) Volume Variance*** = (Actual Production - Budgeted Production) × SR
= (3,800 – 4,000) × 10 = ***2,000 A***

***Working Notes:***

***1.*** Standard rate of Variable OH $= \frac{\text{Budgeted Variable OH}}{\text{Budgeted Production}} = \frac{12{,}000}{4{,}000 \text{ Units}} =$ ***₹3 p.u.***

***2.*** Standard rate of Fixed OH $= \frac{\text{Budgeted Fixed OH}}{\text{Budgeted Production}} = \frac{40{,}000}{4{,}000 \text{ Units}} =$ ***₹10 p.u.***

## PYQ 14

***The following information has been provided by a company:***

| | |
|---|---|
| No of units produced and sold | 6,000 units |
| Standard labour rate per hour | ₹8 |
| Standard hours required for 6,000 units | ? |
| Actual hours required | 17,094 hours |
| Labour efficiency | 105.3% |
| Labour rate variance | ₹68,376 A |

***You are required to calculate:***

*(i)* Actual labour rate per hour
*(ii)* Standard hours required for 6,000 units
*(iii)* Labour efficiency variance
*(iv)* Standard labour cost per unit
*(v)* Actual labour cost per unit

***[(8 Marks) June 2015]***

## Answer

***(i) Actual labour rate per hour:***

Labour rate variance = (AH × SR) - (AH × AR) = 68,376 A
= (17,094 × 8) – (17,094 × AR) = 68,376 A
17,094 AH = 1,36,752 + 68,376
AH = 2,05,128 ÷ 17,094 = ***₹12 per hour***

***(ii) Standard hours required for 6,000 units***

| | | | | |
|---|---|---|---|---|
| Labour efficiency ratio | = | SH ÷ AH | | |
| 105.3% | = | SH ÷ 17,094 | | |
| SH | = | 17,094 × 105.3% | = | ***18,000 hours*** |

***(iii) Labour efficiency variance:***

| | | | | |
|---|---|---|---|---|
| Labour efficiency variance | = | (SH × SR) - (AH × SH) | | |
| | = | (18,000 × 8) – (17,094 × 8) | = | ***7,248 F*** |

***(iv) Standard labour cost per unit:***

| | | | | |
|---|---|---|---|---|
| Standard labour cost per unit | = | (SH × SR) ÷ No of units | | |
| | = | (18,000 × 8) ÷ 6,000 units | = | ***₹24 per unit*** |

***(v) Standard labour cost per unit:***

| | | | | |
|---|---|---|---|---|
| Actual labour cost per unit | = | (AH × AR) ÷ No of units | | |
| | = | (17,094 × 12) ÷ 6,000 units | = | ***₹34.188/unit*** |

***PYQ 15***

X Associates undertake to prepare income tax returns for individuals for a fee. They use the weighted average method and actual costs for the financial reporting purposes. However, for internal reporting, they use a standard costs system. The standards, based on equivalent performance, have been established as follows:

| | |
|---|---|
| Labour per return | 5 hrs @ ₹40 per hour |
| Overhead per return | 5 hrs @ ₹20 per hour |

For March 2015 performance, budgeted overhead is ₹98,000 for standard labour hours allowed. The following additional information pertains to the month of March 2015:

| | | |
|---|---|---|
| | ***Details of Returns*** | |
| March 1 | Return in process (25% complete) | 200 numbers |
| | Return started in March | 825 numbers |
| March 31 | Return in process (80% complete) | 125 numbers |
| | ***Cost Data*** | |
| March 1 | Return in process: | |
| | Labour | ₹12,000 |
| | Overheads | ₹5,000 |
| March 1 to 31 | Current period cost: | |
| | Labour (4,000 hours) | ₹1,78,000 |
| | Overheads | ₹90,000 |

***You are required to compute:***

***(a)*** For each element, equivalent units of performance and the actual cost per equivalent unit.
***(b)*** Actual cost of return-in-process on March 31.
***(c)*** The standard cost per return.
***(d)*** The labour rate and labour efficiency variance as well as overhead volume and overhead expenditure variance.

***[(8 Marks) May 2016]***

***Answer***

***(a) Statement of Equivalent Units of Performance (Weighted Average Method)***

| Particulars | Units | Labour | | Overhead | |
|---|---|---|---|---|---|
| | | % | Eq. Unit | % | Eq. Unit |
| Return Processed (200 + 825 - 125) | 900 | 100 | 900 | 100 | 900 |
| Closing Return-in-process | 125 | 80 | 100 | 80 | 100 |
| ***Total*** | ***1,025*** | - | ***1,000*** | - | ***1,000*** |

***Statement of Actual Cost Per Equivalent Unit***

| *Elements* | *Cost (Previous + Current)* | *Eq. Units* | *Cost Per Unit* |
|---|---|---|---|
| Labour<br>Overheads | 12,000 + 1,78,000 = 1,90,000<br>5,000 + 90,000 = 95,000 | 1,000<br>1,000 | 190.00<br>95.00 |
| ***Actual Cost Per Equivalent Unit*** | | | ***285.00*** |

***(b)*** ***Actual cost of return-in-process on March 31*** = Equivalent units × Cost Per Unit
= 100 units × ₹285 = ***₹28,500***

***(c)*** ***The standard cost per return*** = Labour cost per unit + Overhead cost per unit
= 5 hours × ₹40 + 5 hours × ₹20 = ***₹300 p.u.***

***(d)*** ***Variances:***

Labour Rate Variance = (AH × SR) – (AH × AR)
= (4,000 hours × 40) – ₹1,78,000 = ***18,000 A***

Labour Efficiency Variance = (SH × SR) – (AH × SR)
= (950 units × 5 hrs × ₹40) – (4,000 hrs × ₹40)
= ***30,000 F***

Overhead Volume Variance = Standard Overheads – Budgeted Overheads
= (950 returns × ₹100) – ₹98,000 = ***3,000 A***

Overhead Expenditure Variance = Budgeted Overheads – Actual Overheads
= ₹98,000 – ₹90,000 = ***8,000 F***

***Working notes:***

***1. Calculation of Equivalent Production during current month:***

Production during current month = Total equivalent production – opening equivalent production
= 1,000 units – 50 units (200 × 25%) = ***950 units***

***2. Calculation of budgeted production for March:***

Budgeted production for March = Budgeted Overheads ÷ Overheads per unit
= ₹98,000 ÷ ₹100 (5 hours × ₹20) = ***980 units***

***PYQ 16***

***The following information available from the cost records of a company for the month of July' 2016:***

| | | | |
|---|---|---|---|
| ***(1)*** | Materials purchased | 22,000 pieces | ₹90,000 |
| ***(2)*** | Materials consumed | 21,000 pieces | |
| ***(3)*** | Actual wages paid for | 5,150 hours | ₹25,750 |
| ***(4)*** | Fixed Factory overhead incurred | | ₹46,000 |
| ***(5)*** | Fixed Factory overhead budgeted | | ₹42,000 |
| ***(6)*** | Units produced | | 1,900 |
| ***(7)*** | Standard rates and prices are: | | |

| | |
|---|---|
| Direct material | ₹4.50 per piece |
| Standard input | 10 pieces per unit |
| Direct labour rate | ₹6 per hour |
| Standard requirement | 2.5 hour per unit |
| Overheads | ₹8 per labour hour |

***You are required to calculate the following variances:***

***(a)*** Material price variance
***(b)*** Material usage variance
***(c)*** Labour rate variance

*(d)* Labour efficiency variance
*(e)* Fixed overhead expenditure variance
*(f)* Fixed overhead efficiency variance
*(g)* Fixed overhead capacity variance.

***[(8 Marks) Nov 2016]***

### *Answer*

| | | | | | |
|---|---|---|---|---|---|
| *(a)* | ***Material Price Variance*** | = | (AQ purchased × SP) – (AQ purchased × AP) | | |
| | (based on purchase/single plan) | = | (22,000 × ₹4.5) – ₹90,000 | = | ***9,000 F*** |
| *(b)* | ***Material Usage Variance*** | = | (SQ × SP) - (AQ × SP) | | |
| | | = | (1,900 × 10 × ₹4.5) - (21,000 × ₹4.5) | | |
| | | = | ₹85,500 – ₹94,500 | = | ***9,000 A*** |
| *(c)* | ***Labour Rate Variance*** | = | (AH × SR) – (AH × AR) | | |
| | | = | (5,150 × ₹6) - ₹25,750 | = | ***5,150 F*** |
| *(d)* | ***Labour Efficiency Variance*** | = | (SH × SR) – (AH × SR) | | |
| | | = | (1,900 × 2.5 × ₹6) - (5,150 × ₹6) | = | ***2,400 A*** |
| *(e)* | ***Fixed OH Expenditure Variance*** | = | Budgeted Fixed OH – Actual Fixed OH | | |
| | | = | ₹42,000 – ₹46,000 | = | ***4,000 A*** |
| *(f)* | ***Fixed OH Efficiency Variance*** | = | (SH × SR) – (AH × SR) | | |
| | | = | (1,900 × 2.5 × ₹8) – (5,150 × ₹8) | = | ***3,200 A*** |
| *(g)* | ***Fixed OH Capacity Variance*** | = | (AH × SR) – (BH × SR) | | |
| | | = | (5,150 × ₹8) – ₹42,000 | = | ***800 A*** |

### *PYQ 17*

AB Ltd. has furnished the following data:

| ***Particulars*** | ***Budget*** | ***Actual, July'16*** |
|---|---|---|
| No. of working days | 25 | 27 |
| Production in units | 20,000 | 22,000 |
| Fixed Overheads (₹) | 30,000 | 31,000 |

Budgeted fixed overhead rate is ₹1.00 per hour. In July'16, the actual hours worked were 31,500.

***Calculate the following variances in relation to fixed overheads:***

*(a)* Efficiency Variance *(b)* Capacity Variance *(c)* Calendar Variance
*(d)* Volume Variance *(e)* Expenditure Variance.

***[(5 Marks) May 2017]***

### *Answer*

| | | | | | |
|---|---|---|---|---|---|
| *(a)* | ***Fixed OH Efficiency Variance*** | = | (SH × SR) – (AH × SR) | | |
| | | = | (33,000 × ₹1) – (31,500 × ₹1) | = | ***1,500 F*** |
| *(b)* | ***Fixed OH Capacity Variance*** | = | (AH × SR) – (CH × SR) | | |
| | | = | (31,500 × ₹1) – (32,400 × ₹1) | = | ***900 A*** |
| *(c)* | ***Fixed OH Calendar Variance*** | = | (CH × SR) – (BH × SR) | | |
| | | = | (32,400 × ₹1) – ₹30,000 | = | ***2,400 F*** |
| *(d)* | ***Fixed OH Volume Variance*** | = | (SH × SR) – (BH × SR) | | |
| | | = | (33,000 × ₹1) – ₹30,000 | = | ***3,000 F*** |
| *(e)* | ***Fixed OH Expenditure Variance*** | = | (BH × SR) – (AH × AR) | | |
| | | = | ₹30,000 – ₹31,000 | = | ***1,000 A*** |

***Working notes:***

| | | | | |
|---|---|---|---|---|
| Budgeted hours (BH) | = | ₹30,000 ÷ ₹1 per hour | = | 30,000 hours |
| Standard hour per unit | = | 30,000 hours ÷ 20,000 units | = | 1.5 hour |
| Standard hour for actual output (SH) | = | 22,000 units × 1.5 hours | = | 33,000 hours |
| Calendar hours (CH) | = | (30,000 hours × $^{27}/_{25}$ days) | = | 32,400 hours |

## *PYQ 18*

XYZ Limited produces an article and uses a mixture of material X and Y. The standard quantity and price of materials for one unit of output as under:

| *Materials* | *Quantity* | *Price (₹)* |
|---|---|---|
| X | 2,000 kg | 1.00 per kg |
| Y | 800 kg | 1.50 per kg |

During a period, 1,500 units were produced. The actual consumption of materials and prices are given below:

| *Materials* | *Quantity* | *Price (₹)* |
|---|---|---|
| X | 31,00,000 kg | 1.10 per kg |
| Y | 12,50,000 kg | 1.60 per kg |

***Calculate:***

*(1)* Standard cost for actual output;
*(2)* Material Cost Variance;
*(3)* Material Price Variance;
*(4)* Material Usage Variance.

***[(8 Marks) Nov 2017]***

## *Answer*

| | | | | | |
|---|---|---|---|---|---|
| *(1)* | Standard cost for actual output | = | Std. cost of materials X and Y for 1,500 units of output | | |
| | | = | SQ × SP | = | ***₹48,00,000*** |
| *(2)* | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | | = | ₹48,00,000 – ₹54,10,000 | = | ***₹6,10,000 A*** |
| *(3)* | Material Price Variance | = | (AQ × SP) – (AQ × AP) | | |
| | | = | ₹49,75,000 - ₹54,10,000 | = | ***₹4,35,000 A*** |
| *(4)* | Material Usage Variance | = | (SQ × SP) – (AQ × SP) | | |
| | | = | ₹48,00,000 – ₹49,75,000 | = | ***₹1,75,000 A*** |

***Working notes:***

***1. Basic calculation***

| *Materials* | *SQ × SP* | *RQ × SP* | *AQ × SP* | *AQ × AP* |
|---|---|---|---|---|
| X | 30,00,000 × ₹1.00 | 31,07,143 × ₹1.00 | 31,00,000 × ₹1.00 | 31,00,000 × ₹1.10 |
| Y | 12,00,000 × ₹1.50 | 12,42,857 × ₹1.50 | 12,50,000 × ₹1.50 | 12,50,000 × ₹1.60 |
| Total | ₹48,00,000 | ₹49,71,429 | ₹49,75,000 | ₹54,10,000 |

***2.*** SQ of input for actual output:

| | | | | |
|---|---|---|---|---|
| Materials X | = | 1,500 units × 2,000 kg | = | 30,00,000 kgs |
| Materials Y | = | 1,500 units × 800 kg | = | 12,00,000 kgs |

***3.*** RQ (Revised Quantity) of actual input:

| | | | | |
|---|---|---|---|---|
| Materials X | = | (31,00,000 + 12,50,000) × 20/28 | = | 31,07,143 kgs |
| Materials Y | = | (31,00,000 + 12,50,000) × 8/28 | = | 12,42,857 kgs |

### *PYQ 19*

A company planned to produce 2,000 units of a product in a week of 40 hours by employing 65 skilled workers. Other relevant information are as follows:

| | | |
|---|---|---|
| • Standard wage rate | : | ₹45 per hour |
| • Actual production | : | 1,800 units |
| • Actual number of workers employed | : | 50 workers in a week of 40 hours |
| • Actual wage rate | : | ₹50 per hour |
| • Abnormal time loss | : | due to machine breakdown 100 hours |

***You are required to calculate:***

*(1)* Labour cost, rate, idle time and efficiency variances.
*(2)* Reconcile the variances.

***[(5 Marks) May 2018]***

### *Answer*

*(1)* ***Labour Cost Variance*** = (SH × SR) – (AH × AR)

$$= \frac{65 \times 40}{2{,}000} \times 1{,}800 \times ₹45 - (50 \times 40 \times ₹50)$$

= ***5,300 F***

***Labour Rate Variance*** = (AH × SR) – (AH × AR)
= (50 × 40 × ₹45) - (50 × 40 × ₹50) = ***10,000 A***

***Labour Efficiency Variance*** = (SH × SR) – (AHW × SR)
= (2,340 × ₹45) - (1,900 × ₹45) = ***19,800 F***

***Labour Idle Time Variance*** = (AHW × SR) – (AH × SR)
= (1,900 × ₹45) - (2,000 × ₹45) = ***4,500 A***

*(2)* ***Reconciliation:***

Labour Cost Variance = Labour Rate variance + Labour Efficiency variance + Idle time variance
= 10,000 A + 19,800 F + 4,500 A = ***5,300 F***

### *PYQ 20*

Beta ltd. is manufacture Product N. This is manufactured by mixing two materials namely Material P and Material Q. The standard cost of mixture is as under:

| | | |
|---|---|---|
| Material P | : | 150 ltrs. @ ₹40 per ltr. |
| Material Q | : | 100 ltrs. @ ₹60 per ltr. |
| Standard loss expected | : | 20% of total input during production |

***The cost records for the period exhibit following consumption:***

| | | |
|---|---|---|
| Material P | : | 140 ltrs. @ ₹42 per ltr. |
| Material Q | : | 110 ltrs. @ ₹56 per ltr. |
| Quantity produced | : | 195 ltrs. |

***Calculate:***

*(1)* Material Cost Variance
*(2)* Material Usage Variance
*(3)* Material Price Variance

***[(5 Marks) May 2018]***

### *Answer*

*(1)* ***Material Cost Variance*** = (SQ × SP) – (AQ × AP)
= ₹11,700 – ₹12,040 = ***340 A***

***(2) Material Usage Variance*** = (SQ × SP) - (AQ × SP)
= ₹11,700 – ₹12,200 = ***500 A***

***(3) Material Price Variance*** = (AQ × SP) – (AQ × AP)
= ₹12,200 – ₹12,040 = ***160 F***

***Working notes:***

***Analysis Table***

| Materials | SQ × SP | AQ × SP | AQ × AP |
|---|---|---|---|
| P<br>Q | 146.25 ltrs. × ₹40<br>97.50 ltrs. × ₹60 | 140 ltrs. × ₹40<br>110 ltrs. × ₹60 | 140 ltrs. × ₹42<br>110 ltrs. × ₹56 |
| Total | ₹11,700 | ₹12,200 | ₹12,040 |

***(a) SQ of input for actual output***

Total input = 195 ltrs. ÷ 80% = 243.75 ltrs.

Materials P = 243.75 ltrs. × $^{150}/_{250}$ = 146.25 ltrs.

Materials Q = 243.75 ltrs. × $^{100}/_{250}$ = 97.50 ltrs.

### PYQ 21

A manufacturing concern has provided following information related to fixed overheads:

| Particulars | Standard | Actual |
|---|---|---|
| Output in a month | 5,000 | 4,800 |
| Working days in a month | 25 | 23 |
| Fixed Overhead | ₹5,00,000 | ₹4,90,000 |

***Compute:***

***(1)*** Fixed Overheads Variance
***(2)*** Fixed Overheads Expenditure Variance
***(3)*** Fixed Overheads Volume Variance
***(4)*** Fixed Overheads Efficiency Variance

***[(5 Marks) Nov 2018]***

### Answer

***(1)*** Fixed Overhead Variance = Standard Fixed OH – Actual Fixed OH
$= \frac{5,00,000}{5,000} \times 4,800 - ₹4,90,000$ = ***10,000 A***

***(2)*** Fixed OH Expenditure Variance = Budgeted Fixed OH – Actual Fixed OH
= ₹5,00,000 – ₹4,90,000 = ***10,000 F***

***(3)*** Fixed OH Volume Variance = Standard Fixed OH – Budgeted Fixed OH
= ₹4,80,000 – ₹5,00,000 = ***20,000 A***

***(4)*** Fixed OH Efficiency Variance = Standard Fixed OH – Standard Fixed OH for AH
= SH × SR – AH × SR
$= ₹4,80,000 - \frac{5,00,000}{25 \text{ Days}} \times 23 \text{ Days}$ = ***20,000 F***

***Note:*** In the absence of actual hours, we used calendar hours as actual hours in above solution.

### PYQ 22

Following data is available for ABC Ltd:

| | |
|---|---|
| Standard working hours | 8 hours per day of 5 days per week |
| Maximum capacity | 60 employees |

| | |
|---|---|
| Actual working | 50 employees |
| Actual hours expected to be worked per four week | 8,000 hours |
| Standard hours expected to be earned per four weeks | 9,600 hours |
| Actual hours worked in the four week period | 7,500 hours |
| Standard hours earned in the four week period | 8,800 hours. |

The related period is of 4 weeks.

***Calculate the following ratios:***

***(1)*** Efficiency Ratio,
***(2)*** Activity Ratio,
***(3)*** Standard Capacity Usage Ratio,
***(4)*** Actual Capacity Usage Ratio,
***(5)*** Actual Usage of Budgeted Capacity Ratio.

***[(5 Marks) May 2019]***

## ***Answer***

Maximum Capacity in a budget period = 60 Employees × 8 Hours × 5 Days × 4 Weeks
= 9,600 Hours

Budgeted Hours = 50 Employees × 8 Hours × 5 Days × 4 Weeks
= 8,000 Hours

Actual Hours = 7,500 Hours (given)

Standard Hours for Actual Output = 8,800 Hours

***(1) Efficiency Ratio***

$$= \frac{\text{Standard Hours}}{\text{Actual Hours}} \times 100 = \frac{8{,}800 \text{ Hours}}{7{,}500 \text{ Hours}} \times 100$$

= ***117.33%***

***(2) Activity Ratio***

$$= \frac{\text{Standard Hours}}{\text{Budgeted Hours}} \times 100 = \frac{8{,}800 \text{ Hours}}{8{,}000 \text{ Hours}} \times 100$$

= ***110.00%***

***(3) Standard Capacity Usage Ratio***

$$= \frac{\text{Budgeted Hours}}{\text{Max. Possible Hours in Budget Period}} \times 100$$

$$= \frac{8{,}000 \text{ Hours}}{9{,}600 \text{ Hours}} \times 100 = 83.33\%$$

***(4) Actual Capacity Usage Ratio***

$$= \frac{\text{Actual Hours Worked}}{\text{Max. Possible Working Hours in a Period}} \times 100$$

$$= \frac{7{,}500 \text{ Hours}}{9{,}600 \text{ Hours}} \times 100 = 78.125\%$$

***(5) Actual Usage of Bgt Capacity Ratio***

$$= \frac{\text{Actual Working Hours}}{\text{Budgeted Hours}} \times 100$$

$$= \frac{7{,}500 \text{ Hours}}{8{,}000 \text{ Hours}} \times 100 = 93.75\%$$

## ***PYQ 23***

The standard cost of a chemical mixture is as follows:

60% of Material A @ ₹50 per kg
40% of Material B @ ₹60 per kg

A standard loss of 25% on output is expected in production. The cost records for a period has shown the following usage:

540 kg of Material A @ ₹60 per kg
260 kg of Material B @ ₹50 per kg

The quantity processed was 680 kilograms of good product.

***From the above given information calculate:***

***(1)*** Material Cost Variance
***(2)*** Material Price Variance
***(3)*** Material Usage Variance
***(4)*** Material Mix Variance
***(5)*** Material Yield Variance

***[(10 Marks) Nov 2019]***

### *Answer*

| | | | | | |
|---|---|---|---|---|---|
| ***(1)*** | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | | = | ₹45,900 – ₹45,400 | = | ***₹500 F*** |
| ***(2)*** | Material Price Variance | = | (AQ × SP) – (AQ × AP) | | |
| | | = | ₹42,600 - ₹45,400 | = | ***₹2,800 A*** |
| ***(3)*** | Material Usage Variance | = | (SQ × SP) – (AQ × SP) | | |
| | | = | ₹45,900 – ₹42,600 | = | ***₹3,300 F*** |
| ***(4)*** | Material Mix Variance | = | (RSQ × SP) – (AQ × SP) | | |
| | | = | ₹43,200 – ₹42,600 | = | ***₹600 F*** |
| ***(5)*** | Material Yield Variance | = | (SQ × SP) – (RSQ × SP) | | |
| | | = | ₹45,900 – ₹43,200 | = | ***₹2,700 F*** |

***Working notes:***

***a. Basic Calculation***

| *Materials* | *SQ × SP* | *RSQ × SP* | *AQ × SP* | *AQ × AP* |
|---|---|---|---|---|
| A<br>B | 510 × ₹50<br>340 × ₹60 | 480 × ₹50<br>320 × ₹60 | 540 × ₹50<br>260 × ₹60 | 540 × ₹60<br>260 × ₹50 |
| Total | ₹45,900 | ₹43,200 | ₹42,600 | ₹45,400 |

***b.*** SQ of input for actual output:

| | | | | |
|---|---|---|---|---|
| Input – Loss | = | Output | | |
| Input – 25% Output | = | Output | | |
| Input | = | 125% Output | | |
| Input of Raw Material | = | 125% × 680 kgs of Good Product | = | 850 kgs |
| Materials A | = | 850 kgs × 60% | = | 510 kgs |
| Materials B | = | 850 kgs × 40% | = | 340 kgs |

***c.*** RSQ (Revised Standard Quantity)of actual input:

| | | | | |
|---|---|---|---|---|
| Materials A | = | 800 kgs × 60% | = | 480 kgs |
| Materials B | = | 800 kgs × 40% | = | 320 kgs |

### *PYQ 24*

ABC Ltd. has furnished the following information regarding the overheads for the month of June, 2020:

| | | |
|---|---|---|
| ***(i)*** | Fixed Overhead Cost Variance | ₹2,800 (Adverse) |
| ***(ii)*** | Fixed Overhead Volume Variance | ₹2,000 (Adverse) |
| ***(iii)*** | Budgeted Hours for June, 2020 | 2,400 hours |
| ***(iv)*** | Budgeted Overheads for June, 2020 | ₹12,000 |

*(v)* Actual rate of recovery of overheads ₹8 per hour

***From the given information calculate:***

*(1)* Fixed Overhead Expenditure Variance
*(2)* Actual Overheads Incurred
*(3)* Actual Hours for Actual Production
*(4)* Fixed Overhead Capacity Variance
*(5)* Standard Hours for Actual Production
*(6)* Fixed Overhead Efficiency Variance

***[(10 Marks) Nov 2020]***

***Answer***

*(1)* ***Fixed OH Expenditure Variance*** = Fixed OH Cost Variance – Fixed OH Volume Variance
= ₹2,800 A – ₹2,000 A = ***₹800 A***

*(2)* Fixed OH Expenditure Variance = Budgeted Fixed OH - Actual Fixed OH
₹800 A = ₹12,000 - Actual Fixed OH

***Actual Overheads incurred*** = ₹12,000 + ₹800 = ***₹12,800***

*(3)* ***Actual Hours for Actual Production:***

Actual Overheads Incurred = AH × AR = AH × ₹8 = ₹12,800
Actual Hours (AH) = ₹12,800 ÷ ₹8 = ***1,600***

*(4)* ***Fixed OH Capacity Variance*** = AH × SR – BH × SR
= 1,600 × ₹5 – ₹12,000 = ***4,000 A***

*(5)* ***Standard Hours for Actual Production:***

Fixed OH Volume Variance = SH × SR – BH × SR
= SH × ₹5 – ₹12,000 = ₹2,000 A
SH × ₹5 = ₹2,000 A + ₹12,000 = ₹10,000

SH for Actual Production = ₹10,000 ÷ ₹5 = ***2,000***

*(6)* ***Fixed OH Efficiency Variance*** = SH × SR – AH × AR
= 2,000 × ₹5 – 1,600 × ₹5 = ***2,000 F***

***Working Note:***

*(a)* Standard Rate (SR) = Budgeted OH ÷ Budgeted Hours
= ₹12,000 ÷ 2,400 = ***₹5/hour***

***PYQ 25***

Premier Industries has a small factory where 52 workers are employed on an average for 25 days a month and they work 8 hours per day. The normal down time is 15%. The firm has introduced standard costing for cost control. Its monthly budget for November, 2020 shows that the budgeted variable and fixed overhead are ₹1,06,080 and ₹2,21,000 respectively. The firm reports the following details of actual performance for November, 2020, after the end of the month:

| | |
|---|---|
| Actual hours worked | 8,100 hours |
| Actual production expressed in standard hours | 8,800 hours |
| Actual Variable Overheads | ₹1,02,000 |
| Actual Fixed Overheads | ₹2,00,000 |

***You are required to calculate:***

*(1)* Variable Overhead Variances:
*(a)* Variable overhead expenditure variance.
*(b)* Variable overhead efficiency variance.

***(2)*** Fixed Overhead Variances:

***(a)*** Fixed overhead budget variance.
***(b)*** Fixed overhead capacity variance.
***(c)*** Fixed overhead efficiency variance.

***(3)*** Control Ratios:

***(a)*** Capacity ratio.
***(b)*** Efficiency ratio.
***(c)*** Activity ratio.

***[(10 Marks) Jan 2021]***

***Answer***

***(1) Variable Overhead Variances:***

| | | | | | |
|---|---|---|---|---|---|
| ***(a)*** | Variable OH Exp. Variance | = | (AH × SR) - (AH × AR) | | |
| | | = | (8,100 hours × ₹12) - ₹1,02,000 | = | ***₹4,800 A*** |
| ***(b)*** | Variable OH Eff. Variance | = | (SH – AH) × SR | | |
| | | = | (8,800 hours – 8,100 hours) × ₹12 | = | ***₹8,400 F*** |

***(2) Fixed Overhead Variances:***

| | | | | | |
|---|---|---|---|---|---|
| ***(a)*** | Fixed OH Budget Variance | = | Budgeted Overheads - Actual Overheads | | |
| | | = | ₹2,21,000 - ₹2,00,000 | = | ***₹21,000 F*** |
| ***(b)*** | Fixed OH Capacity Variance | = | (AH × SR) – (BH × SR) | | |
| | | = | (8,100 hours × ₹25) - ₹2,21,000 | = | ***₹18,500 A*** |
| ***(c)*** | Fixed OH Efficiency Variance | = | (SH – AH) × SR | | |
| | | = | (8,800 hours – 8,100 hours) × ₹25 | = | ***₹17,500 F*** |

***(3) Control Ratios:***

| | | | | | |
|---|---|---|---|---|---|
| ***(a)*** | Capacity Ratio | = | (Actual Hours ÷ Budgeted Hours) × 100 | | |
| | | = | (8,100 hours ÷ 8,840 hours) × 100 | = | ***91.63%*** |
| ***(b)*** | Efficiency Ratio | = | (Standard Hours ÷ Actual Hours) × 100 | | |
| | | = | (8,800 hours ÷ 8,100 hours) × 100 | = | ***108.64%*** |
| ***(c)*** | Activity Ratio | = | (Standard Hours ÷ Budgeted Hours) × 100 | | |
| | | = | (8,800 hours ÷ 8,840 hours) × 100 | = | ***99.55%*** |

***Working Notes:***

| | | | | |
|---|---|---|---|---|
| Variable OH Standard Rate (SR) | = | Budgeted Variable OH ÷ Budgeted Hours | | |
| | = | ₹1,06,080 ÷ 8,840 hours | = | ***₹12 per hour*** |
| Fixed OH Standard Rate (SR) | = | Budgeted Fixed OH ÷ Budgeted Hours | | |
| | = | ₹2,21,000 ÷ 8,840 hours | = | ***₹25 per hour*** |
| Budgeted Hours | = | (52 workers × 25 Days × 8 Hours) – 15% Normal down time | | |
| | = | ***8,840 hours*** | | |

***PYQ 26***

The standard output of a product 'DJ' is 25 units per hour in manufacturing department of a company employing 100 workers. In a 40 hours week, the department produced 960 units of product 'DJ' despite 5% of the time paid was lost due to an abnormal reason. The hourly wage rates actually paid were ₹6.20, ₹6.00 and ₹5.70 respectively to Group 'A' consisting 10 workers, Group 'B' consisting 30 workers and Group 'C' consisting 60 workers. The standard wage rate per labour is same for all the workers. Labour Efficiency Variance is given ₹240 (F).

***You are required to compute:***

*(1)* Total Labour Cost Variance,
*(2)* Total Labour Rate Variance,
*(3)* Total Labour Gang variance,
*(4)* Total Labour Yield Variance, and
*(5)* Total Labour Idle Time Variance.

***[(10 Marks) July 2021]***

## Answer

| | | | | | |
|---|---|---|---|---|---|
| *(1)* | Labour Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | | = | (3,840 × 6) – 23,360 | = | ***₹320 A*** |
| *(2)* | Labour Rate Variance | = | (AH × SR) – (AH × AR) | | |
| | | = | (4,000 × 6) – 23,360 | = | ***₹640 F*** |
| *(3)* | Labour Gang Variance | = | (RH × SR) – (AHW × SR) | | |
| | | = | ₹22,800 – ₹22,800 | = | ***Nil*** |
| *(4)* | Labour Yield Variance | = | (SH × SR) – (RH × SR) | | |
| | | = | (3,840 × 6) – ₹22,800 | = | ***₹240 F*** |
| *(5)* | Labour Idle Variance | = | (AHW × SR) – (AH × SR) | | |
| | | = | ₹22,800 – ₹24,000 | = | ***₹1,200 A*** |

### Working notes:

***(a) Basic Calculation***

| Workers | SH × SR | RSH × SR | AHW × SR | AH × SR | AH × AR |
|---|---|---|---|---|---|
| Group A | 384 × 6 | 380 × 6 | 380 × 6 | 10 × 40 × 6.00 | 10 × 40 × 6.20 |
| Group B | 1,152 × 6 | 1,140 × 6 | 1,140 × 6 | 30 × 40 × 6.00 | 30 × 40 × 6.00 |
| Group C | 2,304 × 6 | 2,280 × 6 | 2,280 × 6 | 60 × 40 × 6.00 | 60 × 40 × 5.70 |
| Total | ₹23,040 | ₹22,800 | ₹22,800 | ₹24,000 | ₹23,360 |

***(b) RSH (Revised Standard Hours) and AHW (Actual Hours Worked):***

| | | | | |
|---|---|---|---|---|
| Total Actual Hours Worked | = | (100 workers × 40 hours) – 5% abnormal idle time | | |
| | = | 3,800 hours | | |
| Group A | = | 3,800 × 10/100 | = | 380 hours |
| Group B | = | 3,800 × 30/100 | = | 1,140 hours |
| Group C | = | 3,800 × 60/100 | = | 2,280 hours |

***(c) SH (Standard hours) for actual output 1,920 units:***

| | | | | |
|---|---|---|---|---|
| Total standard hours | = | (100 workers × 1 hour ÷ 25 units) × 960 units | | |
| | = | 3,840 hours | | |
| Group A | = | 3,840 × 10/100 | = | 384 hours |
| Group B | = | 3,840 × 30/100 | = | 1,152 hours |
| Group C | = | 3,840 × 60/100 | = | 2,304 hours |

***(d) Standard wages rate (SR):***

| | | | | |
|---|---|---|---|---|
| Labour Efficiency Variance | = | (SH - AHW) × SR | | |
| 240 F | = | (3,840 – 3,800) × SR | | |
| SR | = | 240 ÷ 40 | = | ₹6 per hour |

## PYQ 27

In a manufacturing company the standard units of production for the year were fixed at 1,20,000 units and overhead expenditures were estimated to be as follows:

| | ₹ |
|---|---:|
| Fixed | 12,00,000 |
| Semi-variable (60% expenses are of fixed nature and 40% are of variable nature) | 1,80,000 |
| Variable | 6,00,000 |

Actual production during the month of April, 2021 was 8,000 units. Each month has 20 working days. During the month there was one public holiday. The actual overheads were as follows:

| | ₹ |
|---|---:|
| Fixed | 1,10,000 |
| Semi-variable (60% expenses are of fixed nature and 40% are of variable nature) | 19,200 |
| Variable | 48,000 |

***You are required to calculate the following variances for the month of April 2021:***

**1.** Overhead Cost variance
**2.** Fixed Overhead Cost variance
**3.** Variable Overhead Cost variance
**4.** Fixed Overhead Volume variance
**5.** Fixed Overhead Expenditure Variance
**6.** Calendar Variance

***[(10 Marks) Dec 2021]***

## *Answer*

**1. *Overheads Cost Variance*** = Standard OH for 8,000 units – Actual OH
= 8,000 units × (10.9 + 5.6) – (1,10,000 + 19,200 + 48,000)
= 1,32,000 - 1,77,200 = ***45,200 A***

**2. *Fixed Overhead Cost Variance*** = Standard Fixed OH – Actual Fixed OH
= 8,000 units × 10.9 – 1,2,1520
= 87,200 – 1,21,520 = ***34,320 A***

**3. *Variable Overhead Cost Variance*** = Standard Variable OH – Actual Variable OH
= 8,000 units × 5.6 – 55,680
= 44,800 – 55,680 = ***10,880 A***

**4. *Fixed Overhead Volume Variance*** = Standard Fixed OH – Budgeted Fixed OH
= 8,000 units × 10.9 – 1,09,000
= 87,200 – 1,09,000 = ***21,800 A***

**5. *Fixed Overhead Expenditure Variance*** = Budgeted Fixed OH – Actual Fixed OH
= 1,09,000 – 1,2,1520 = ***12,520 A***

**6. *Calendar Variance*** = Standard Fixed OH for 19 days – Budgeted Fixed OH
= 1,09,000 × 19/20 – 1,09,000
= 1,03,550 – 1,09,000 = ***5,450 A***

***Working notes:***

Total Budgeted Fixed OH per annum = ₹12,00,000 + 60% × ₹1,80,000 = ₹13,08,000

Total Budgeted Fixed OH per month = ₹13,08,000 ÷ 12 = ₹1,09,000

Total Budgeted Variable OH per annum = ₹6,00,000 + 40% × ₹1,80,000 = ₹6,72,000

Total Actual Fixed OH per month = ₹1,10,000 + 60% × ₹19,200 = ₹1,21,520

Total Actual Variable OH per month = ₹48,000 + 40% × ₹19,200 = ₹55,680

Standard Fixed OH rate = Budgeted Fixed OH ÷ Budgeted Units
= ₹13,08,000 ÷ 1,20,000 units = ₹10.9 per unit

Standard Variable OH rate = Budgeted Variable OH ÷ Budgeted Units
= ₹6,72,000 ÷ 1,20,000 units = ₹5.6 per unit

### PYQ 28

A manufacturing department of a company has employed 120 workers. The standard output of product "NPX" is 20 units per hour and the standard wage rate is ₹25 per labour hour.

In a 48 hours week, the department produced 1,000 units of 'NPX' despite 5% of the time paid being lost due to an abnormal reason. The hourly wages actually paid were ₹25.70 per hour.

***Calculate:***

*(a)* Labour Cost Variance
*(b)* Labour Rate Variance
*(c)* Labour Efficiency Variance
*(d)* Labour Idle time Variance

***[(5 Marks) May 2022]***

### Answer

| | | | | | |
|---|---|---|---|---|---|
| *(a)* | Labour Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | | = | ₹1,50,000 - ₹1,48,032 | = | ***₹1,968 F*** |
| *(b)* | Labour Rate Variance | = | (AH × SR) – (AH × AR) | | |
| | | = | ₹1,44,000 – ₹1,48,032 | = | ***₹4,032 A*** |
| *(c)* | Labour Efficiency Variance | = | (SH × SR) – (AHW × SR) | | |
| | | = | ₹1,50,000 – ₹1,36,800 | = | ***₹13,200 F*** |
| *(d)* | Labour Idle Variance | = | (AHW × SR) – (AH × SR) | | |
| | | = | ₹1,36,800 – ₹1,44,000 | = | ***₹7,200 A*** |

***Working notes:***

***1. Basic Calculation***

| ***SH × SR*** | ***AHW × SR*** | ***AH × SR*** | ***AH × AR*** |
|---|---|---|---|
| 1,000 units × 6 hours × ₹25 | 120 workers × 45.6 hours (48 – 5%) × ₹25 | 120 workers × 48 hours × ₹25 | 120 workers × 48 hours × ₹25.70 |
| ₹1,50,000 | ₹1,36,800 | ₹1,44,000 | ₹1,48,032 |

***2.*** Standard hour per unit = (120 workers × 1 hour) ÷ 20 units = 6 hours per unit

### PYQ 29

Y Ltd. manufactures "Product M" which requires three types of raw materials – "A", "B" & "C". Following information related to 1st quarter of the F.Y. 2022-23 has been collected from its books of accounts. The standard material input required for 1,000 kg of finished product 'M' are as under:

| ***Material*** | ***Quantity (Kg.)*** | ***Std. Rate per Kg. (₹)*** |
|---|---|---|
| A | 500 | 25 |
| B | 350 | 45 |
| C | 250 | 55 |
| | 1,100 | |
| Less: Standard Loss | 100 | |
| ***Standard Output*** | ***1,000*** | |

During the period the company produced 20,000 kgs of product 'M' for which the actual quantity of materials consumed and purchase prices are as under:

| ***Material*** | ***Quantity (Kg.)*** | ***Purchase price per kg. (₹)*** |
|---|---|---|
| A | 11,000 | 23 |
| B | 7,500 | 48 |
| C | 4,500 | 60 |

***You are required to calculate:***

*(a)* Material Cost Variance

***(b)*** Material Price Variance for each raw material and Product 'M'
***(c)*** Material Usage Variance for each raw material and product 'M'
***(d)*** Material Yield Variance

***Note:*** Indicate the nature of variance i.e. Favourable or Adverse.

***[(10 Marks) Nov 2022]***

## *Answer*

| | | | | | |
|---|---|---|---|---|---|
| ***1.*** | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | | = | ₹8,40,000 – ₹8,83,000 | = | ***₹43,000 A*** |
| ***2.*** | Material Price Variance | = | AQ × (SP – AP) | | |
| | Material A | = | 11,000 × (25 – 23) | = | ***₹22,000 F*** |
| | Material B | = | 7,500 × (45 – 48) | = | ***₹22,500 A*** |
| | Material C | = | 4,500 × (55 – 60) | = | ***₹22,500 A*** |
| | Total | = | 22,000 F + 22,500 A + 22,500 A | = | ***₹23,000 A*** |
| ***3.*** | Material Usage Variance | = | SP × (SQ – AQ) | | |
| | Material A | = | 25 × (10,000 – 11,000) | = | ***₹25,000 A*** |
| | Material B | = | 45 × (7,000 – 7,500) | = | ***₹22,500 A*** |
| | Material C | = | 55 × (5,000 – 4,500) | = | ***₹27,500 F*** |
| | Total | = | 25,000 A + 22,500 A + 27,500 F | = | ***₹20,000 A*** |
| ***4.*** | Material Yield Variance | = | (SQ × SP) – (RSQ × SP) | | |
| | | = | ₹8,40,000 – ₹8,78,170 | = | ***₹38,170 A*** |

### *Working notes:*

***a. Basic Calculation***

| *Materials* | *SQ × SP* | *RSQ × SP* | *AQ × SP* | *AQ × AP* |
|---|---|---|---|---|
| A | 10,000 × ₹25 | 10,455 × ₹25 | 11,000 × ₹25 | 11,000 × ₹23 |
| B | 7,000 × ₹45 | 7,318 × ₹45 | 7,500 × ₹45 | 7,500 × ₹48 |
| C | 5,000 × ₹55 | 5,227 × ₹55 | 4,500 × ₹55 | 4,500 × ₹60 |
| Total | ₹8,40,000 | ₹8,78,170 | ₹8,60,000 | ₹8,83,000 |

***b.*** SQ of input for actual output:

| | | | | |
|---|---|---|---|---|
| Materials A | = | 500 kgs × 20 times | = | 10,000 kgs |
| Materials B | = | 350 kgs × 20 times | = | 7,000 kgs |
| Materials C | = | 250 kgs × 20 times | = | 5,000 kgs |

***c.*** RSQ (Revised Standard Quantity)of actual input:

| | | | | |
|---|---|---|---|---|
| Materials A | = | 23,000 kgs × 500/1,100 | = | 10,455 kgs |
| Materials B | = | 23,000 kgs × 350/1,100 | = | 7,318 kgs |
| Materials C | = | 23,000 kgs × 250/1,100 | = | 5,227 kgs |

## *PYQ 30*

NC Limited uses a standard costing system for the manufacturing of its product 'X'. The following information is available for the last week of the month:

- 25,000 kg of raw material were actually purchased for ₹3,12,500. The expected output is 8 units of product 'X' from each one kg of raw material. There is no opening and closing inventories. The material price variance and material cost variance, as per cost records, are ₹12,500 (F) and ₹1800 (A), respectively.
- The standard time to produce a batch of 10 units of product 'X' is 15 minutes. The standard wage rate per labour hour is ₹50. The company employs 125 workers in two categories, skilled and semi-skilled, in a ratio of 60:40. The hourly wages actually paid were ₹50 per hour for skilled workers and ₹40 per hour for semi-skilled workers. The weekly working hours are 40 hours per worker. Standard wage rate is the same for skilled and semi-skilled workers.

- The monthly fixed overheads are budgeted at ₹76,480. Overheads are evenly distributed throughout the month and assume 4 weeks in a month. In the last week of the month, the actual fixed overhead expenses were ₹19,500.

***Required:***

***(a)*** Calculate the standard price per kg and the standards quantity of raw material.

***(b)*** Calculate the material usage variance, labour cost variance, and labour efficiency variance.

***(c)*** Calculate the fixed overhead cost variance, the fixed overhead expenditure variance and the fixed overhead volume variance.

***Note:*** Indicate the variance of variance i.e favourable or adverse.

***[(10 Marks) May 2023]***

## *Answer*

| | | | | | |
|---|---|---|---|---|---|
| ***(a)*** | Material Price Variance | = | (AQ × SP) – (AQ × AP) | | |
| | ₹12,500 F | = | 25,000 × SP – ₹3,12,500 | | |
| | Standard Price per kg | = | ***₹13*** | | |
| | Material Cost Variance | = | (SQ × SP) – (AQ × AP) | | |
| | ₹1,800 A | = | SQ × ₹13 – ₹3,12,500 | | |
| | Standard Quantity of material | = | ***23,900 Kgs*** | | |
| ***(b)*** | Material Usage Variance | = | Material Cost Variance – Material Price Variance | | |
| | | = | ₹1,800 A – ₹12,500 F | = | ***₹26,800 A*** |
| | Labour Cost Variance | = | (SH × SR) – (AH × AR) | | |
| | | = | (4,780 × ₹50) – [(3,000 hours × ₹50) + (2,000 hours × ₹40)] | | |
| | | = | ***₹9,000 F*** | | |
| | Labour Efficiency Variance | = | (SH × SR) – (AH × SR) | | |
| | | = | (4,780 × ₹50) – (5,000 hours × ₹50) | = | ***₹11,000 A*** |
| ***(c)*** | Fixed OH Cost Variance | = | (SH × SR) – (AH × SR) | | |
| | | = | ₹18,279 – ₹19,500 | = | ***₹1,221 A*** |
| | Fixed OH Exp. Variance | = | (BH × SR) – (AH × SR) | | |
| | | = | ₹19,120 – ₹19,500 | = | ***₹380 A*** |
| | Fixed OH Volume Variance | = | (SH × SR) – (BH × SR) | | |
| | | = | ₹18,279 – ₹19,120 | = | ***₹841 A*** |

***Working Notes:***

| | | | | | |
|---|---|---|---|---|---|
| ***(1)*** | Actual Quantity Produced | = | 23,900 kgs Materials × 8 units per kg | | |
| | | = | 1,91,200 units of Product X | | |
| ***(2)*** | Standard Hours | = | 1,91,200 units × 1.5 minute per unit/60 | = | 4,780 hours |
| ***(3)*** | Actual Hours | = | 125 workers × 40 hours | = | 5,000 hours |
| ***(4)*** | Actual Hours (Skilled) | = | 125 workers × 60% × 40 hours | = | 3,000 hours |
| | Actual Hours (Semi-skilled) | = | 125 workers × 40% × 40 hours | = | 2,000 hours |
| ***(5)*** | Budgeted Fixed OH (BH × SR) | = | ₹76,480 ÷ 4 weeks | = | ₹19,120 |
| ***(6)*** | Recovered Fixed OH (SH × SR) | = | ₹19,120 × 4,780 hours/5,000 hours | = | ₹18,279 |

# SUGGESTED REVISION

| Ques. No. | Observations or KEY Points (Note down during revisions) | Page No. of Practical Register | 1st & 2nd Revision | 3rd, 4th & 5th Revision | Revision during Exams |
|---|---|---|---|---|---|
| BQ (Book Questions covering Study Module of ICAI, PM, RTP's, MTP's and Important Questions) | | | | | |
| 1 | | | Y | - | - |
| 2 | | | Y | - | - |
| 3 | | | Y | - | - |
| 4 | | | Y | - | - |
| 5 | | | Y | Y | - |
| 6 | | | Y | Y | Y |
| 7 | | | Y | Y | - |
| 8 | | | Y | Y | Y |
| 9 | | | Y | Y | - |
| 10 | | | Y | Y | Y |
| 11 | | | Y | Y | Y |
| 12 | | | Y | Y | Y |
| 13 | | | Y | Y | Y |
| 14 | | | Y | Y | Y |
| 15 | | | Y | Y | Y |
| 16 | | | Y | Y | Y |
| 17 | | | Y | Y | - |
| 18 | | | Y | Y | Y |
| 19 | | | Y | Y | Y |
| 20 | | | Y | Y | Y |
| 21 | | | Y | - | - |
| 22 | | | Y | Y | Y |
| 23 | | | Y | Y | Y |
| 24 | | | Y | - | - |
| 25 | | | Y | Y | Y |
| 26 | | | Y | Y | Y |
| 27 | | | Y | Y | Y |
| 28 | | | Y | Y | Y |
| 29 | | | Y | Y | - |
| 30 | | | Y | Y | Y |
| 31 | | | Y | Y | - |
| 32 | | | Y | Y | - |
| 33 | | | Y | Y | - |
| 34 | | | Y | Y | Y |
| 35 | | | Y | Y | Y |
| 36 | | | Y | - | - |
| 37 | | | Y | Y | - |
| 38 | | | Y | Y | - |
| 39 | | | Y | Y | - |
| 40 | | | Y | Y | Y |
| 41 | | | Y | Y | Y |
| 42 | | | Y | Y | Y |
| 43 | | | Y | Y | - |
| 44 | | | Y | - | - |
| 45 | | | Y | Y | Y |
| 46 | | | Y | - | - |
| 47 | | | Y | Y | Y |
| 48 | | | Y | Y | Y |

| PYQ (Past Year Questions) | | | | | |
|---|---|---|---|---|---|
| 1 | | | Y | Y | Y |
| 2 | | | Y | - | - |
| 3 | | | Y | Y | Y |
| 4 | | | Y | Y | - |
| 5 | | | Y | Y | - |
| 6 | | | Y | - | - |
| 7 | | | Y | Y | - |
| 8 | | | Y | - | - |
| 9 | | | Y | Y | Y |
| 10 | | | Y | Y | - |
| 11 | | | Y | Y | Y |
| 12 | | | Y | Y | - |
| 13 | | | Y | - | - |
| 14 | | | Y | Y | Y |
| 15 | | | Y | Y | Y |
| 16 | | | Y | Y | - |
| 17 | | | Y | - | - |
| 18 | | | Y | Y | - |
| 19 | | | Y | Y | Y |
| 20 | | | Y | - | - |
| 21 | | | Y | Y | - |
| 22 | | | Y | Y | Y |
| 23 | | | Y | Y | - |
| 24 | | | Y | Y | Y |
| 25 | | | Y | Y | Y |
| 26 | | | Y | Y | - |
| 27 | | | Y | Y | Y |
| 28 | | | Y | - | - |
| 29 | | | Y | Y | - |
| 30 | | | Y | Y | Y |

# *CHAPTER - 13*

# *MARGINAL COSTING*

## *LEARNING OBJECTIVES*

***When you have finished studying this chapter, you should be able to:***

- ***Explain the meaning and characteristics of Marginal Costing.***
- ***Describe the meaning of CVP Analysis and apply the same in making short-term managerial decisions.***
- ***Describe the meaning and application of Break-even point, Margin of safety, Angle of incidence etc. and apply the same in making computations.***
- ***Calculate and explain the various formulae used in CVP analysis.***
- ***Apply the concepts of marginal costing and CVP analysis in short-term decision making.***
- ***Differentiate between Marginal Costing and Absorption Costing.***

# CONTRIBUTION, PV RATIO, BEP, MOS AND PROFIT PLANNING

### BQ 1

Tata Ltd. had incurred fixed expenses of ₹4,50,000 with sales of ₹15,00,000 and earned a profit of ₹3,00,000 during the first half year. In second half it suffered a loss of ₹1,50,000.

***Calculate:***

*(i)* The profit volume ratio, B.E.P. & MOS for the first half year.

*(ii)* Expected sales volume for second half year assuming that sales price and fixed expenses remains unchanged during the second half year.

*(iii)* B.E.P. & MOS of the whole year.

***[(i) 50%, 9,00,000, 6,00,000; (ii) 6,00,000, 18,00,000, 3,00,000]***

### BQ 2

A company sells its product at ₹15. In a period, if it produces and sells 8,000 units, it incurs a loss of ₹5 per unit. If the volume is raised to 20,000 units, it earns a profit of ₹4 per unit.

***Calculate break-even point both in terms of rupees as well as in units.***

***[12,000 units, ₹1,80,000]***

### BQ 3

The ratio of variable cost to sales is 70%. The break - even point occurs at 60% of the capacity sales. Find the capacity sales when fixed costs are ₹90,000. Also compute profit at 75 % of the capacity sales.

***[₹5,00,000 ₹22,500]***

### BQ 4

A company earned a profit of ₹30,000 during the year. If the marginal cost and selling price of a product are ₹8 and ₹10 per unit respectively.

***Find out the amount of 'Margin of Safety'.***

***[₹1,50,000]***

### BQ 5

A company has made a profit of ₹50,000 during the year. If the selling price and marginal cost (variable cost) of the product are ₹15 and ₹12 per unit respectively.

***Find out the amount of margin of safety.***

### Answer

***Marginal of Safety*** $= \dfrac{\text{Pr ofit}}{\text{* PV Ratio}} = \dfrac{50{,}000}{20\ \%} =$ ***₹2,50,000***

****P/V Ratio*** $= \dfrac{\text{Contribution}}{\text{Sales}} \times 100 = \dfrac{15-12}{15} \times 100 =$ ***20%***

### BQ 6

If Margin of safety of AB Ltd. is ₹2,40,000 (40% of sales) and P/V ratio is 30%.

***Calculate its (1) Break-even sales and (2) Amount of profit on sales of ₹9,00,000.***

***[(1) ₹3,60,000 (2) ₹1,62,000]***

### BQ 7

Reliance Ltd. has earned a contribution of ₹2,00,000 and net profit of ₹1,50,000 on sales of ₹8,00,000.

***Calculate MOS and BEP.***

***[₹6,00,000 & ₹2,00,000]***

### BQ 8

| | Sales | Profit |
|---|---|---|
| Period I | ₹10,000 | ₹2,000 |

| | | |
|---|---|---|
| ***Period II*** | ₹15,000 | ₹4,000 |

***You are required to calculate:***

*(i)* P/V ratio
*(ii)* Fixed cost
*(iii)* Break-even sales volume
*(iv)* Sales to earn a profit of ₹3,000
*(v)* Sales to earn profit @ 10% of Sales
*(vi)* Profit when sales are ₹8,000

***[(i) 40% (ii) ₹2,000 (iii) ₹5,000 (iv) ₹12,500 (v) ₹6,667 (vi) ₹1,200]***

### BQ 9

You are given the following data:

| Year | Sales | Profit |
|---|---|---|
| 2022 | ₹1,20,000 | ₹8,000 |
| 2023 | ₹1,40,000 | ₹13,000 |

***Find out:***

***(i)*** P/V ratio, ***(ii)*** BEP, ***(iii)*** Profit when sales are ₹1,80,000, ***(iv)*** Sales required earn a profit of ₹12,000, ***(v)*** Margin of safety in year 2023.

***[(i) 25% (ii) ₹88,000 (iii) ₹23,000 (iv) ₹1,36,000 (v) ₹52,000]***

### BQ 10

You are given the following particulars:

*(i)* Fixed cost ₹1,50,000
*(ii)* Variable cost ₹15 per unit
*(iii)* Selling price is ₹30 per unit

***Calculate:***

*(a)* Break-even point
*(b)* Sales to earn a profit of ₹20,000

***Answer***

***(a) Break-even point*** $= \dfrac{\text{Fixed cost}}{\text{Contribution per unit}} = \dfrac{1{,}50{,}000}{30-15}$

$=$ ***10,000 Units***

***(b) Sales to earn profit of ₹20,000*** $= \dfrac{\text{Fixed cost} + \text{Desired profit}}{{}^{*}\text{PV ratio}} = \dfrac{1{,}50{,}000 + 20{,}000}{50\%}$

$=$ ***₹3,40,000***

****PV ratio*** $= \dfrac{\text{Contribution}}{\text{Sales}} \times 100 = \dfrac{15}{30} \times 100$

$=$ ***50%***

### BQ 11

If P/V ratio is 60% and the marginal cost of the product is ₹20. What will be the selling price?

***Answer***

***Sales Price*** $= \dfrac{\text{Variable Cost Per Unit}}{{}^{*}\text{Variable Cost Ratio}} = \dfrac{20}{40\%} =$ ***₹50 per unit***

****Variable Cost Ratio*** = 100 – P/V Ratio = 100 – 60 = ***40%***

### BQ 12

***1. Ascertain profit, when:***

| | |
|---|---|
| Sales | 2,00,000 |
| Fixed Cost | 40,000 |
| BEP | 1,60,000 |

**2. Ascertain sales, when:**

| | |
|---|---|
| Fixed cost | 20,000 |
| Profit | 10,000 |
| BEP | 40,000 |

## Answer

**1. Profit:**

| | | | | | | |
|---|---|---|---|---|---|---|
| BEP Sales × P/V Ratio | = | Fixed Cost | = | ₹1,60,000 × P/V ratio | = | ₹40,000 |
| P/V ratio | = | ₹40,000 ÷ ₹1,60,000 | | | = | 25% |
| Sales × P/V Ratio | = | Fixed Cost + Profit | = | ₹2,00,000 × 25% | = | ₹50,000 |
| Profit | = | ₹50,000 - ₹40,000 | = | ***₹10,000*** | | |

**2. Sales:**

| | | | | | | |
|---|---|---|---|---|---|---|
| BEP Sales × P/V Ratio | = | Fixed Cost | = | ₹40,000 × P/V ratio | = | ₹20,000 |
| P/V ratio | = | ₹20,000 ÷ ₹40,000 | | | = | 50% |
| Sales × P/V Ratio | = | Fixed Cost + Profit | = | ₹20,000 + ₹10,000 | = | ₹30,000 |
| Sales | = | ₹30,000 ÷ 50% | = | ***₹60,000*** | | |

## BQ 13

A company has a PV ratio of 40%. By what percentage must sales be increased to offset 20% reduction in selling price?

## Answer

Let current sales be ₹100. Hence,

| *Particulars* | *Current* | *Proposed* |
|---|---|---|
| Sales | 100 | 80 |
| Less: Variable cost (60% of sale) | 60 | 60 |
| ***Contribution*** | ***40*** | ***20*** |

In order to maintain the same contribution, the volume of sales should be $= \frac{40}{20} \times 80$ = ₹160

***Thus, if selling price is reduced by 20%, the sales will have to be increased by 60% i.e. from ₹100 to ₹160.***

## BQ 14

| | |
|---|---|
| Direct materials cost per unit | ₹8 |
| Direct Labour cost per unit | ₹5 |
| Fixed overheads | ₹24,000 |
| Selling price per unit | ₹25 |
| Trade discount | 4% |
| Variable overheads | 60% on direct labour |

***You are required to calculate the break-even point in terms of net sales value at that point, if sales are 15% and 20% above the break-even volume, determine the net profits.***

***[BEP: ₹72,000; Profit: ₹3,600 and ₹4,800]***

## BQ 15

***From the following data, calculate cash break-even point in units and in value:***

| | |
|---|---|
| Selling price per unit | ₹10 |
| Variable cost per unit | ₹6 |
| Fixed cost (including ₹3,000 as depreciation) | ₹10,000 |

***[1,750 units and ₹17,500]***

### *BQ 16*

***The cost of production of a product per unit is as follows:***

| | |
|---|---|
| Direct materials | ₹7 |
| Direct wages | ₹3 |
| Factory overheads: | |
| Variable | ₹2 |
| Fixed | ₹2 |
| Administrative overheads | ₹1 |
| | ***₹15*** |

The figures given above are based on an output of 1,00,000 units. Selling price per unit is ₹20.

***What is the break-even point?***

***[37,500 units]***

### *BQ 17*

Indian plastics make plastics buckets, an analysis of their accounting reveals.

| | |
|---|---|
| Variable cost per bucket | ₹20 |
| Fixed cost | ₹50,000 for the year |
| Capacity | 2,000 Buckets |
| Selling Price per Bucket | ₹70 |

***Required:***

***(i)*** Find the Break Even Point
***(ii)*** Find the number of buckets to be sold to get a profit of ₹30,000
***(iii)*** If the company can manufacture 600 bucket more per year with an additional fixed costs of ₹2,000. What should be the selling price to maintain the profit per bucket as at ***(ii)*** above.

***[(i) 1,000 units (ii) 1,600 units (iii) ₹58.75]***

### *BQ 18*

***(i)*** Break-even point expressed in amount of sales in rupees and in units.
***(ii)*** Number of units that must be sold to earn a profit of ₹60,000 per year.
***(iii)*** How many units are to be sold to earn a net income of 10% of sales?

| | |
|---|---|
| Sales Price | 20 per unit. |
| Variable manufacture cost | 11 per unit |
| Variable selling cost | 3 per unit |
| Fixed Factory Overhead | 5,40,000 per year |
| Fixed Selling cost | 2,52,000 per year |

***[(i) ₹26,40,000 or 1,32,000 units(ii) 1,42,000 units (iii) 1,98,000 units]***

### *BQ 19*

An automobile manufacturing company produces different models of Cars. The budget in respect of model 118 for the month of March is as under:

| ***Budgeted Output*** | | ***40,000 units*** |
|---|---|---|
| | ***₹ (in lacs)*** | ***₹ (in lacs)*** |
| Variable costs: | | |
| Materials | 79,200 | |
| Labour | 15,600 | |
| Direct Expenses | 37,200 | 1,32,000 |
| Fixed costs: | | |
| Specific Fixed Cost | 27,000 | |
| Allocated Fixed Cost | 33,750 | 60,750 |
| ***Total Costs*** | | ***1,92,750*** |
| Profit | | 17,250 |
| ***Sales*** | | ***2,10,000*** |

***Calculate:***

*(i)* Profit with 10 percent increase in selling price with a 10 percent reduction in sales volume.

*(ii)* Volume to be achieved to maintain the original profit after a 10 per cent rise in material costs at the originally budgeted selling price per unit.

***[(i) ₹28,350 Lakhs (ii) 44,521 units]***

## *BQ 20*

An enthusiastic marketing manager suggests to his Managing Director that only if he is permitted to reduce the selling price of product by 20%. He would be able to achieve a 30 % increase in sales volume.

The managing Director finding that the sales volume increases exceeds, in percentage the extent of requested reduction in price gives the clearance.

***You are given the following information:***

| | |
|---|---|
| Present selling price per unit | ₹7.50 |
| Present volume of sales | 2,00,000 units |
| Total variable costs | ₹10,50,000 |
| Total Fixed costs | ₹3,60,000 |

***Assuming no change in the cost pattern in the coming period:***

*(i)* Examine the consequences of the Managing Director decision assuming that 30% increase in sales is realized.

*(ii)* At what volume of sales the present quantum of profits canbe sustained after effecting the price reduction?

***[(i) Loss ₹1,65,000 from the existing profit of ₹90,000 (ii) Sales ₹36,00,000 or 6,00,000 units]***

## *BQ 21*

A company budgets for a production of 1,50,000 units. The variable cost per unit is ₹14 and fixed cost is ₹2 per unit. The company fixes its selling price to fetch a profit of 15% in costs.

*(a)* What is break-even point?

*(b)* P.V. ratio?

*(c)* If company reduces it's selling price by 5% how does the revised selling price affect the break-even point and the profit-volume ratio?

*(d)* If an increase in profit of 10% is desired more than the budget what should be the sales at reduced price?

***[(a) 68,182 units (b) PV Ratio 23.91% (c) BEP increased by 18,025 units and PV Ratio decreased by 4% (d) ₹34,96,000]***

## *BQ 22*

A retail dealer in garments is currently selling 24,000 shirts annually. He supplies the following details for the year ended 31st December, 2022:

| | |
|---|---|
| Selling price per shirt | ₹40 |
| Variable cost per shirt | ₹25 |
| Staff salaries for the year | ₹1,20,000 |
| General office costs for the year | ₹80,000 |
| Advertising costs for the year | ₹40,000 |

***As a cost accountant of the firm you are required to answer the following each part independently:***

*(i)* Calculate the break-even point and margin of safety in sales revenue and number of shirts sold.

*(ii)* Assume that 20,000 shirts were sold in a year, find out the net profit of the firm.

*(iii)* If it is decided to introduce selling commission of ₹3 per shirt, how many shirts would require to be sold in a year to earn a net income of ₹15,000?

*(iv)* Assuming that for the year 2023 an additional staff salary of ₹33,000 is anticipated and price of a shirt is likely to be increased by 15%, what should be the break-even point in number of shirts and sales revenue?

***[(i) BEP: 16,000 Shirts, ₹6,40,000; MOS: 8,000 Shirts, ₹3,20,000; (ii) ₹60,000; (iii) 21,250 shirts; (iv) BEP 13,000 shirts and ₹5,98,000]***

**BQ 23**

A Ltd. maintains margin of safety of 37.5% with an overall contribution to sales ratio of 40%. Its fixed costs amount to ₹5,00,000.

***Calculate (i)*** Break-even sales, ***(ii)*** Total sales, ***(iii)*** Total variable cost, ***(iv)*** Current profit, ***(v)*** New 'margin of safety' if the sales volume is increased by 7-½%.

**Answer**

| | | | | | |
|---|---|---|---|---|---|
| ***(i)*** | Break Even Sales × PV Ratio | = | Fixed Cost | | |
| | Break Even Sales × 40% | = | ₹5,00,000 | | |
| | ***Break Even Sales*** | = | ₹5,00,000 ÷ 40% | = | ***₹12,50,000*** |
| ***(ii)*** | Total Sales | = | Break Even Sales + Margin of Safety | | |
| | Total Sales | = | ₹12,50,000 + 37.50% of Total Sales | | |
| | 62.50% of Total Sales | = | ₹12,50,000 | | |
| | ***Total Sales*** | = | ₹12,50,000 ÷ 62.50% | = | ***₹20,00,000*** |
| ***(iii)*** | Contribution to Sales Ratio | = | 40% | | |
| | Therefore, Variable cost to Sales Ratio | = | 60% | | |
| | Variable cost | = | 60% of sales | | |
| | ***Variable cost*** | = | 60% of ₹20,00,000 | = | ***₹12,00,000*** |
| ***(iv)*** | ***Current Profit*** | = | Sales - (Variable Cost + Fixed Cost) | | |
| | | = | ₹20,00,000 - (₹12,00,000 + ₹5,00,000) | | |
| | | = | ***₹3,00,000*** | | |
| ***(v)*** | ***New Sales value*** | = | ₹20,00,000 + 7.50% of ₹20,00,000 | | |
| | | = | ***₹21,50,000*** | | |
| | ***New Margin of Safety*** | = | New Sales value – BES | | |
| | | = | ₹21,50,000 - ₹12,50,000 | = | ***₹9,00,000*** |

**BQ 24**

PQR Ltd. has furnished the following data for the two years:

| ***Particulars*** | ***2022*** | ***2023*** |
|---|---|---|
| Sales | ₹8,00,000 | ? |
| Profit Volume Ratio | 50% | 37.50% |
| Margin of Safety sales as a % of total sales | 40% | 21.875% |

There has been substantial savings in the fixed cost in the year 2023 due to the restructuring process. The company could maintain its sales quantity level of 2022 in 2023 by reducing selling price.

***You are required to calculate the following:***

***(i)*** Sales for 2023 in ₹;
***(ii)*** Fixed cost for 2023;
***(iii)*** Break-even sales for 2023 in ₹.

**Answer**

***In 2022:***

| | | | | |
|---|---|---|---|---|
| PV ratio | = | 50% | | |
| Variable cost ratio | = | 100% - 50% | = | 50% |
| Variable cost in 2022 | = | ₹8,00,000 × 50% | = | ***₹4,00,000*** |

***In 2023:***

Sales quantity has not changed. Thus variable cost in 2023 is ₹4,00,000.

| | | | | |
|---|---|---|---|---|
| PV ratio | = | 37.50% | | |
| Thus, Variable cost ratio | = | 100% - 37.50% | = | 62.50% |

***(i) Thus sales in 2023*** = $\frac{4,00,000}{62.5\%}$ = ***₹6,40,000***

At break-even point, fixed cost is equal to contribution.

In 2023, Break-even sales = 100% - 21.875% = 78.125%

***(iii) Break-even sales*** = 6,40,000 × 78.125% = ***₹5,00,000***

***(ii) Fixed cost*** = BEP sales × PV ratio
= 5,00,000 × 37.50% = ***₹1,87,500***

## BQ 25

A single product company sells its product at ₹60 per unit. In 2022, the company operated at a margin of safety of 40%. The fixed costs amounted to ₹3,60,000 and the variable cost ratio to sales was 80%. In 2023, it is estimated that the variable cost will go up by 10% and the fixed cost will increase by 5%.

Find the selling price required to be fixed in 2023 to earn the same P/V ratio as in 2022. Assuming the same selling price of ₹60 per unit in 2023, find the number of units required to be produced and sold to earn the same profit as in 2022.

## Answer

**1. *PV Ratio in 2022:***

| | |
|---|---|
| Selling price per unit | 60 |
| Variable cost (80% of Selling price) | 48 |
| Contribution | 12 |
| ***P/V Ratio*** | ***20%*** |

**2. *No. of units sold in 2022:***

***Break-even point*** = Fixed cost ÷ Contribution per unit
= ₹3,60,000 ÷ ₹12 = ***30,000 units.***

Margin of safety is 40%. Therefore, break-even sales will be 60% of units sold.

***No. of units sold*** = BEP in units ÷ 60% = ***50,000 units.***

**3. *Profit earned in 2022:***

***Profit*** = Contribution – Fixed cost
= (50,000 × ₹12) - ₹3,60,000 = ***₹2,40,000***

**4. *Selling price to be fixed in 2023:***

Revised variable cost = ₹48 × 110% = ₹52.80

Revised fixed cost = ₹3,60,000 × 105% = 3,78,000

PV Ratio = 20% (Same as of 2016)

Variable cost ratio = 80%

***Revised selling price*** = ₹52.80 ÷ 80% = ***₹66.00***

**5. *No. of units to be produced and sold in 2023 to earn the same profit:***

$$= \frac{\text{Fixed cos t} + \text{Desired profit}}{\text{Contributi on per unit}} = \frac{2,40,000+3,78,000}{60-52.80} =$$ ***85,834 units***

## BQ 26

A company has three factories situated in North, East and South with its head office in Mumbai. The management has received the following summary report on the operations of each factory for a period:

| Factory | Sales | | Profit | |
|---|---|---|---|---|
| | Actual | Over / (Under Budget) | Actual | Over / (Under Budget) |
| North | 1,100 | ( 400 ) | 135 | ( 180 ) |
| East | 1,450 | 150 | 210 | 90 |
| South | 1,200 | ( 200 ) | 330 | ( 110 ) |

***Calculate for each factory and for the company as a whole for the period Fixed Costs and Break - Even Sales.***

***[(i) ₹1,350 (ii) ₹2,500]***

## BQ 27

The profit for the year of R.J. Ltd. works out to 12.5% of the capital employed and the relevant figures are as under:

| | |
|---|---|
| Sales | ₹5,00,000 |
| Direct Materials | ₹2,50,000 |
| Direct Labour | ₹1,00,000 |
| Variable Overheads | ₹40,000 |
| Capital Employed | ₹4,00,000 |

The new Sales Manager who has joined the company recently estimates for next year a profit of about 23% on capital employed, provided the volume of sales is increased by 10% and simultaneously there is an increase in Selling Price of 4% and an overall cost reduction in all the elements of cost by 2%.

***Find out by computing in detail the cost and profit for next year, whether the proposal of Sales Manager can be adopted.***

## Answer

***Statement Showing Cost and Profit for the Next Year***

| Particulars | Existing | Estimated |
|---|---|---|
| Sales Value | 5,00,000 | 5,72,000 |
| Less: Direct Materials | 2,50,000 | 2,69,500 |
| Direct Labour | 1,00,000 | 1,07,800 |
| Variable Overheads | 40,000 | 43,120 |
| ***Contribution*** | ***1,10,000*** | ***1,51,580*** |
| Less: Fixed Cost | 60,000 | 58,800 |
| ***Profit*** | ***50,000*** | ***92,780*** |

***Fixed Cost*** = Existing Sales – Existing Marginal Cost – 12.5% on ₹4,00,000
= ₹5,00,000 – ₹3,90,000 – ₹50,000 = ***₹60,000***

Percentage Profit on Capital Employed equals to 23.19% $\left(\frac{92,780}{4,00,000}\times 100\right)$

***Since the Profit of ₹92,780 is more than 23% of capital employed, the proposal of the Sales Manager can be adopted.***

## BQ 28

An Indian soft drink company is planning to establish a subsidiary company in Bhutan to produce mineral water. Based on the estimated annual sales of 40,000 bottles of the mineral water, cost studies produced the following estimates for the Bhutanese subsidiary:

| Name of Expense | Total Annual Cost | % of Total annual cost which is variable |
|---|---|---|
| Materials | 2,10,000 | 100% |
| Labour | 1,50,000 | 80% |
| Factory Overheads | 92,000 | 60% |
| Administration Expenses | 40,000 | 35% |

The Bhutanese production will be sold by manufacturer's representatives who will receive a commission of 8% of the sale price. No portion of the Indian office expenses is to be allocated to the Bhutanese subsidiary.

***You are required to***

1. Compute the sale price per bottle to enable the management to realize an estimated 10% profit on sale proceeds in Bhutan.
2. Calculate the break-even point in sales as also in number of bottles for the Bhutanese subsidiary on the assumption that the sale price is ₹14 per bottle.

## *Answer*

### 1. *Calculation of sales price to earn 10% profit on sales:*

Sales value = Fixed cost + Variable cost + Profit

Sales value = (2,10,000 × 0% + 1,50,000 × 20% + 92,000 × 40% + 40,000 × 65%) + (2,10,000 × 100% + 1,50,000 × 80% + 92,000 × 60% + 40,000 × 35% + Commission @ 8% on sales) + Profit @10% on sales

Sales value = 92,800 + 3,99,200 + 8% of sales + 10% of sales

Sales value = 4,92,000 ÷ 82% = ***₹6,00,000***

Sales Price = Sales value ÷ No. of units

= 6,00,000 ÷ 40,000 units = ***₹15.00***

### 2. *Calculation of Break Even Point:*

Break Even Point (in units) = Fixed cost ÷ Contribution per unit

= 92,800 ÷ 2.90 (14 – 11.10) = ***32,000 units***

Break Even Point (in ₹) = BEP in units × Sales price per unit

= 32,000 units × 14.00 = ***₹4,4,8000***

***Working notes:***

Total variable cost = 3,99,200 + 8% on sales (8% of 40,000 × 14.00)

= 4,44,000

Variable cost per unit = Total variable cost ÷ No. of units

= 4,44,000 ÷ 40,000 units = ₹11.10

## *BQ 29*

Can Cola, a zero sugar cold drink manufacturing Indian company, is planning to establish a subsidiary company in Nepal to produce coconut flavoured juice. Based on the estimated annual sales of 60,000 bottles of the juice, cost studies produced the following estimates for the Nepalese subsidiary:

| *Name of Expense* | *Total Annual Cost (₹)* | *% of Total annual cost which is variable* |
|---|---|---|
| Materials | 2,70,000 | 100% |
| Labour | 1,97,000 | 80% |
| Factory Overheads | 1,20,000 | 60% |
| Administration Expenses | 52,000 | 35% |

The Nepalese production will be sold by manufacturer's representatives who will receive a commission of 9% of the sale price. No portion of the Indian office expenses is to be allocated to the Nepalese subsidiary.

***You are required to***

1. Compute the sale price per bottle to enable the management to realize an estimated 20% profit on sale proceeds in Nepal.
2. Calculate the break-even point in sales and also in number of bottles for the Nepalese subsidiary on the assumption that the sale price is ₹14 per bottle.

## *Answer*

### 1. *Calculation of sales price to earn 20% profit on sales:*

| | | | | |
|---|---|---|---|---|
| Sales value | = | Fixed cost + Variable cost + Profit | | |
| Sales value | = | (2,70,000 × 0% + 1,97,000 × 20% + 1,20,000 × 40% + 52,000 × 65%) + (2,70,000 × 100% + 1,97,000 × 80% + 1,20,000 × 60% + 52,000 × 35% + Commission @ 9% on sales) + Profit @20% on sales | | |
| Sales value | = | 1,21,200 + 5,17,800 + 9% of sales + 20% of sales | | |
| Sales value | = | 6,39,000 ÷ 71% | = | ***₹9,00,000*** |
| Sales Price | = | Sales value ÷ No. of units | | |
| | = | 9,00,000 ÷ 60,000 units | = | ***₹15.00*** |

***2. Calculation of Break Even Point:***

| | | | | |
|---|---|---|---|---|
| Break Even Point (in units) | = | Fixed cost ÷ Contribution per unit | | |
| | = | 1,21,200 ÷ 4.11 (14 – 9.89) | = | ***29,489 Bottles*** |
| Break Even Point (in ₹) | = | BEP in units × Sales price per unit | | |
| | = | 29,489 Bottles × 14.00 | = | ***₹4,12,846*** |

***Working notes:***

| | | | | |
|---|---|---|---|---|
| Total variable cost | = | 5,17,800 + 9% on sales (9% of 60,000 × 14.00) | | |
| | = | 5,93,400 | | |
| Variable cost per unit | = | Total variable cost ÷ No. of units | | |
| | = | 5,93,400 ÷ 60,000 units | = | ₹9.89 |

## ***BQ 30***

Following data is available from the costing department of arya Ltd. which manufactures and market a single product:

| | |
|---|---|
| Material | ₹32 per unit |
| Conversion Cost (Variable) | ₹24 per unit |
| Dealer's Margin (10% of Sales) | ₹8 per unit |
| Selling Price | ₹80 per unit |
| Fixed Cost | ₹10,00,000 |
| Present Sales | 90,000 units |
| Capacity Utilization | 60% |

There is acute competition in market, thus extra efforts are necessary to enhance the sales, for this following suggestions have been proposed:

***(a)*** Reducing selling price by 5 percent

***(b)*** Increasing dealer's margin by 20 percent over existing rate.

***Which of two suggestions would you recommend, if the company desires to maintain the present profit? Give reasons.***

## ***Answer***

***(a) Reducing Selling Price by 5%:***

| | | | | |
|---|---|---|---|---|
| New Sale Price | = | ₹80 – 5% | = | ₹76 per unit |
| New Dealer's Margin | = | ₹76 × 10% | = | ₹7.60 per unit |
| New Variable Cost | = | ₹32 + ₹24 + ₹7.60 | = | ₹63.60 per unit |
| New Contribution | = | ₹76 – ₹63.60 | = | ₹12.40 per unit |
| Required Sales Units | = | (Fixed Cost + Profit) ÷ Contribution per unit | | |
| | = | (₹10,00,000 + ₹4,40,000) ÷ ₹12.40 | = | ***1,16,129 units*** |

***(b) Increasing Dealer's Margin by 20% over existing rate:***

| | | | | |
|---|---|---|---|---|
| New Dealer's Margin | = | ₹8 + 20% | = | ₹9.60 per unit |
| New Variable Cost | = | ₹32 + ₹24 + ₹9.60 | = | ₹65.60 per unit |

| | | | | |
|---|---|---|---|---|
| New Contribution | = | ₹80 – ₹65.60 | = | ₹14.40 per unit |
| Required Sales Units | = | (Fixed Cost + Profit) ÷ Contribution per unit | | |
| | = | (₹10,00,000 + ₹4,40,000) ÷ ₹14.40 | = | ***1,00,000 units*** |

***Recommendation:*** Company should go with option (b) i.e. increase in dealer's commission, with option (b) company can earn same profit with less sales effort than option (a).

***Working Note:***

| | | |
|---|---|---|
| Existing Profit | = | Sales – Variable Cost – Fixed Cost |
| | = | {(₹80 – ₹32 – ₹24 – ₹8) × 90,000 units} – ₹10,00,000 |
| | = | ***₹4,40,000*** |

## *BEP IN CASE OF STOCK*

### *BQ 31*

The Co. has an opening stock of 6,000 units of output. Production plan for current period is 24,000 units. Expected sale for the current period comes to 28,000 units. The selling price per unit ₹10 variable cost per unit is ₹6 while it was ₹5 per unit during the previous period. Fixed cost of the current period is ₹86,000.

***Find out break-even point using FIFO Method.***

***[14,000 units of current period and 6,000 units of previous period]***

## *INDIFFERENCE POINT OR COST BEP*

### *BQ 32*

A Company is intending to hire super start Ranbeer or Shahid for the purpose of advertisement. The hire of Ranbeer will result in variable cost of ₹5,00,000 per day and in fixed cost ₹20,00,000. The hire of Shahid will result in a fixed cost of ₹24,00,000 and variable cost of ₹4,00,000 per day.

***Compute the cost BEP and also specify in different conditions which super star will be preferable.***

***[4 days]***

### *BQ 33*

M Company's central services department is evaluating new copying machines to replace the firm's current copier, which is worm out. The analysis of alternative machines has been narrowed to two and the estimated costs of operating them are shown below:

| *Particulars* | *Cost per 100 copies* | |
|---|---|---|
| | *Machine A* | *Machine B* |
| Material Costs (Variable) | ₹60 | ₹40 |
| Labour Cost (variable) | ₹80 | ₹30 |
| Annual Lease Cost (Fixed) | ₹30,000 | ₹58,000 |

***Required:***

***(i)*** Compute the cost indifference points for the two alternatives.
***(ii)*** What do the cost indifference points suggest as a course of action in this regard?
***(iii)*** If the management expects to need 87,000 copies next year, which copier would be most economical?

***[(i) 40,000 Copies; (ii) Below 40,000: A, At 40,000: A/B, Above 40,000: B; (iii) B]***

### *BQ 34*

The following are cost data for three alternative ways of processing the clerical work for cases brought before the LC Court System:

| *Particulars* | *'A' Manual (₹)* | *'B' Semi Automatic (₹)* | *'C' Fully Automatic (₹)* |
|---|---|---|---|
| ***Monthly fixed costs:*** | | | |
| Occupancy | 15,000 | 15,000 | 15,000 |
| Maintenance contract | - | 5,000 | 10,000 |

| | | | |
|---|---|---|---|
| Equipment lease | - | 25,000 | 1,00,000 |
| ***Unit variable cost (per report):*** | | | |
| Supplies | 40 | 80 | 20 |
| Labour | 200<br>(5 hours × 40) | 60<br>(1 hour × 60) | 20<br>(0.25 hour × 80) |

***1.*** Calculate cost indifference points. Interpret your results.

***2.*** If the present case load is 600 cases and it is expected to go up to 850 cases in near future, which method is most appropriate on cost considerations?

## *Answer*

### *1. Statement Showing Cost Indifference Point*

| *Particulars* | *A and B* | *A and C* | *B and C* |
|---|---|---|---|
| *(a)* Differential Fixed Cost | 30,000<br>(45,000 – 15,000) | 1,10,000<br>(1,25,000 – 15,000) | 80,000<br>(1,25,000 – 45,000) |
| *(b)* Differential Variable Cost | 100<br>(240 - 140) | 200<br>(240 - 40) | 100<br>(140 - 40) |
| *(c)* Cost Indifference Point<br>(a) ÷ (b) | ***300 cases*** | ***550 cases*** | ***800 cases*** |

### *Interpretation of Results*

At activity level below the indifference points, the alternative with lower fixed costs and higher variable costs should be used. At activity level above the indifference point alternative with higher fixed costs and lower variable costs should be used.

| *Number of Cases* | *Alternative to be Chosen* |
|---|---|
| Cases ≤ 300 | Alternative 'A' |
| 300 ≥ Cases ≤ 800 | Alternative 'B' |
| Cases ≥ 800 | Alternative 'C' |

***2.*** Present case load is 600. Therefore, alternative B is suitable. As the number of cases is expected to go upto 850 cases, alternative C is most appropriate.

## *SHUT DOWN POINT*

### *BQ 35*

Mr. X has ₹2,00,000 investments in his business firm. He wants a 15 percent return on his money. From an analysis of recent cost figures, he finds that his variable cost of operating is 60 percent of sales, his fixed costs are ₹80,000 per year.

***Show computations to answer the following questions:***

***(i)*** What sales volume must be obtained to break even?

***(ii)*** What sales volume must be obtained to get 15 percent return on investment?

***(iii)*** Mr. X estimates that even if he closed the doors of his business, he would incur ₹25,000 as expenses per year. At what sales would he be better off by locking his business up?

## *Answer*

***P/V Ratio*** = 100 – Variable cost ratio

= 100 – 60% = ***40%***

***(i) Break-even point*** = Fixed cost ÷ PV ratio

= 80,000 ÷ 40% = ***₹2,00,000***

***(ii) Sales volume required*** = $\frac{\text{Fixed cost} + \text{Desired profit}}{\text{PV ratio}}$

$$= \frac{80{,}000 + 15\% \text{ of } 2{,}00{,}000}{40\%} = ₹2{,}75{,}000$$

***(iii) Shut down point***

$$< \frac{\text{Avoidable fixed cost}}{\text{PV ratio}}$$

$$< \frac{80{,}000 - 25{,}000}{40\%} < ₹1{,}37{,}500$$

***Mr. X should shut down the business if the sale is less than ₹1,37,500.***

## *SALES MIX OR CONCEPT OF MULTIPLE PRODUCTS*

### *BQ 36*

A Company sells two products, A and B. The sales mix is 5 units of A and 3 units of B. The sale price of A and B are ₹80 and ₹60 per unit respectively and variable cost ₹50 and ₹45 respectively. Fixed costs are ₹4,87,500 per month.

***Compute the break-even point.***

### *Answer*

***Break Even Points in units*** $= \frac{\text{Fixed cost}}{\text{Composite contribution per unit}} = \frac{4{,}87{,}500}{24.375}$

= ***20,000 units (12,500 units of A and 7,500 units of B)***

***WN:***

***Composite contribution*** = [(30 × 5 units of A) + (15 × 3 units of B)] ÷ 8 units

= ***24.375 per unit***

### *BQ 37*

The product mix of a Gama Ltd. is as under:

| Particulars | Product M | Product N |
|---|---|---|
| Units | 54,000 | 18,000 |
| Selling price | ₹7.50 | ₹15.00 |
| Variable cost | ₹6.00 | ₹4.50 |

Find the break-even points in units, if the company discontinues product 'M' and replace with product 'O'. The quantity of product 'O' is 9,000 units and its selling price and variable costs respectively are ₹18 and ₹9. Fixed Cost is ₹ 15,000.

### *Answer*

***Break Even Point*** $= \frac{\text{Fixed Cost}}{\text{Composite Contribution Per Unit}} = \frac{15{,}000}{10}$

= ***1,500 units (1,000 units of 'N' and 500 units of 'O' in 2 : 1)***

***Working note:***

***Composite contribution*** = [(10.50 × 2 units of N) + (9 × 1 unit of O)] ÷ 3 units = ***10 per unit***

### *BQ 38*

M.K. Ltd. manufactures and sells a single product X whose selling price is ₹40 per unit and the variable cost is ₹16 per unit.

***(a)*** If the Fixed Costs for this year are ₹4,80,000 and the annual sales are at 60% margin of safety, calculate the rate of net return on sales, assuming an income tax level of 40%

***(b)*** For the next year, it is proposed to add another product line Y whose selling price would be ₹50 per unit and the variable cost ₹10 per unit. The total fixed costs are estimated at ₹6,66,600. The sales mix units of X : Y would be 7 : 3. At what level of sales next year, would M.K. Ltd. break even? Give separately for both X and Y the breakeven sales in rupee and quantities.

**Answer**

**(a) Rate of net return on sales** = $\frac{4,32,000}{20,00,000} \times 100$ = **21.60%**

**(b) Break Even Point** = $\frac{\text{Fixed Cost}}{\text{Composite Contribution Per Unit}}$ = $\frac{6,66,600}{28.80}$

= **23,145.80 units**

Break even Sales Mix:

Product X = 70% of 23,145.80 units = **16,202 units or ₹6,48,080**

Product Y = 30% of 23,145.80 units = **6,944 units or ₹3,47,200**

**Working notes:**

**(1) Calculation of Net return:**

| Particulars | (₹) |
|---|---|
| Sales value (50,000 units × 40) | 20,00,000 |
| Less: Variable cost (50,000 units × 16) | 8,00,000 |
| **Contribution** | **12,00,000** |
| Less: Fixed cost | 4,80,000 |
| **Profit Before Tax** | **7,20,000** |
| Less: Income Tax @ 40% | 2,88,000 |
| **Profit After Tax** | **4,32,000** |

BEP in units = $\frac{\text{Fixed cost}}{\text{contribution per unit}}$ = $\frac{4,80,000}{40-16}$ = 20,000 units

Total sales = BEP + MOS (60% of sales) = 20,000 units + 60% sales

Total sales = 20,000 units ÷ 40% = 50,000 units

**(2)** Composite Contribution per unit= (40 – 16) × 7/10 + (50 - 10) × 3/10 = **28.80 per unit**

**BQ 39**

Prisha Limited manufactures three different products and the following information has been collected from the books of accounts:

| | Products | | |
|---|---|---|---|
| | **A** | **B** | **C** |
| Sales Mix | 40% | 35% | 25% |
| Selling Price | ₹300 | ₹400 | ₹200 |
| Variable Cost | ₹150 | ₹200 | ₹120 |
| Total Fixed Costs | | | ₹18,00,000 |
| Total Sales | | | ₹60,00,000 |

The company has currently under discussion, a proposal to discontinue the manufacture of Product C and replace it with Product E, when the following results are anticipated:

| | Products | | |
|---|---|---|---|
| | **A** | **B** | **E** |
| Sales Mix | 45% | 30% | 25% |
| Selling Price | ₹300 | ₹400 | ₹300 |
| Variable Cost | ₹150 | ₹200 | ₹150 |
| Total Fixed Costs | | | ₹18,00,000 |
| Total Sales | | | ₹64,00,000 |

**Required:**

**(a)** Calculate the PV ratio, Total contribution, Profit and Break-even sales for the existing product mix.

**(b)** Calculate the PV ratio, Total contribution, Profit and Break-even sales for the proposed sales mix.

**(c)** State whether the proposed sales mix is accepted or not?

***Answer***

***(a) Calculation of PV Ratio, Total Contribution, Profit and BEP for the existing product mix:***

| | Products | | | Total |
|---|---|---|---|---|
| | A | B | C | |
| Selling Price (₹) | 300 | 400 | 200 | |
| Less: Variable Cost (₹) | 150 | 200 | 120 | |
| Contribution per unit (₹) | 150 | 200 | 80 | |
| P/V Ratio | 50% | 50% | 40% | |
| Sales Mix | 40% | 35% | 25% | |
| Contribution per rupee of sales (P/V Ratio × Sales Mix) | 20% | 17.5% | 10% | 47.5% |
| Present Total Contribution (₹60,00,000 × 47.5%) | | | | ₹28,50,000 |
| Less: Fixed Costs | | | | ₹18,00,000 |
| Present Profit | | | | ₹10,50,000 |
| Present Break-Even Sales (₹18,00,000/0.475) | | | | ₹37,89,473.68 |

***(b) Calculation of PV Ratio, Total Contribution, Profit and BEP for the proposed product mix:***

| | Products | | | Total |
|---|---|---|---|---|
| | A | B | E | |
| Selling Price (₹) | 300 | 400 | 300 | |
| Less: Variable Cost (₹) | 150 | 200 | 150 | |
| Contribution per unit (₹) | 150 | 200 | 80 | |
| P/V Ratio | 50% | 50% | 50% | |
| Sales Mix | 45% | 30% | 25% | |
| Contribution per rupee of sales (P/V Ratio × Sales Mix) | 22.5% | 15% | 12.5% | 50% |
| Present Total Contribution (₹64,00,000 × 50%) | | | | ₹32,00,000 |
| Less: Fixed Costs | | | | ₹18,00,000 |
| Present Profit | | | | ₹14,00,000 |
| Present Break-Even Sales (₹18,00,000/0.5) | | | | ₹36,00,000 |

***(c)*** The proposed sales mix increases the total contribution to sales ratio from 47.5% to 50% and the total profit from ₹10,50,000 to ₹14,00,000. Thus, the proposed sales mix should be accepted.

## *MERGER OF PLANTS*

### *BQ 40*

Two manufacturing companies A and B are planning to merge. The details are as follows:

| | A | B |
|---|---|---|
| Capacity utilisation (%) | 90 | 60 |
| Sales (₹) | 31,50,000 | 24,00,000 |
| Variable Cost (₹) | 19,80,000 | 11,25,000 |
| Fixed Cost (₹) | 6,50,000 | 7,50,000 |

***Assuming that the proposal is implemented, calculate:***

***(1)*** Break-Even sales of the merged plant and the capacity utilization at that stage.
***(2)*** Profitability of the merged plant at 80% capacity utilization.
***(3)*** Sales Turnover of the merged plant to earn a profit of ₹30,00,000.
***(4)*** When the merged plant is working at a capacity to earn a profit of ₹30,00,000, what percentage of increase in selling price is required to sustain an increase of 5% in fixed overheads.

***Answer***

***(1) Break-Even sales of the merged plant and the capacity utilization at that stage:***

Break-Even Sales = Fixed Cost ÷ P/V Ratio
= ₹14,00,000 ÷ 45.67% = ***₹30,65,470***

Capacity Utilization = (BEP Sales ÷ Sales at 100% Capacity) × 100

= (₹30,65,470 ÷ ₹75,00,000) × 100 = ***40.87%***

***(2) Profitability of merged plant at 80% Capacity:***

Profit = Contribution – Fixed Cost
= {(₹75,00,000 × 80%) × 45.67%} - ₹14,00,000= ***₹13,40,200***

***(3) Sales to earn a profit of ₹30,00,000:***

Sales = (Fixed Cost + Profit) ÷ P/V Ratio
= (₹14,00,000 + ₹30,00,000) ÷ 45.67% = ***₹96,34,333***

***(4) % increase in selling price:***

Increase in fixed cost = ₹14,00,000 × 5% = ₹70,000

∴ % increase in sales price = (₹70,000 ÷ ₹96,34,333) × 100 = ***0.727%***

***Working Notes:***

***Calculation of Sales, Variable Cost, P/V Ratio and Fixed Cost at 100% capacity of merged plant:***

Sales = (₹31,50,000 ÷ 90%) + (₹24,00,000 ÷ 60%) = ₹75,00,000

Variable Cost = (₹19,80,000 ÷ 90%) + (₹11,25,000 ÷ 60%) = ₹40,75,000

P/V Ratio = (Contribution ÷ Sales) × 100
= {(₹75,00,000 – ₹40,75,000) ÷ ₹75,00,000} × 100 = 45.67%

Fixed Cost = ₹6,50,000 + ₹7,50,000 = ₹14,00,000

## ***KEY FACTOR OR LIMITING FACTOR***

***BQ 41***

Moon Ltd. produces products 'X', 'Y', 'Z' and has decided to analyse it's production mix in respect of these three products: 'X', 'Y', 'Z'.

***You have the following information:***

| | ***X*** | ***Y*** | ***Z*** |
|---|---|---|---|
| Direct Material ₹ (per unit) | 160 | 120 | 80 |
| Variable Overheads ₹ (per unit) | 8 | 20 | 12 |
| Direct Labour: | | | |

| ***Departments:*** | ***Rate per hour (₹)*** | ***Hours per unit X*** | ***Hours per unit Y*** | ***Hours per unit Z*** |
|---|---|---|---|---|
| Department A | 4 | 6 | 10 | 5 |
| Department B | 8 | 6 | 15 | 11 |

From the current budget, further details are as below:

| ***Particulars*** | ***X*** | ***Y*** | ***Z*** |
|---|---|---|---|
| Annual production at present (in units) | 10,000 | 12,000 | 20,000 |
| Estimated selling price per unit (₹) | 312 | 400 | 240 |
| Sales departments estimate of possible sales in the coming year (in units) | 12,000 | 16,000 | 24,000 |

There is constraint on supply of labour in Department A and its manpower cannot be increased beyond its present level.

***Required:***

***(i)*** Identify the best possible product mix of Moon Ltd.
***(ii)*** Calculate the total contribution from the best possible product mix.

## Answer

### (i) Statement Showing Best Possible Mix of Moon Ltd.

| Rank | Product | Units/Mix | Labour hours dept. A |
|---|---|---|---|
| I | Product X | 12,000 | 72,000 |
| II | Product Y | 16,000 | 1,60,000 |
| III | Product Z (48,000 ÷ 5) | 9,600 | 48,000 (b.f.) |
| **Total** | | **37,600** | **2,80,000** |

***Best possible mix of X, Y, Z is 12,000 : 16,000 : 9,600***

### (ii) Calculation of contribution from best possible mix:

Total contribution = 12,000 units of X × 72 + 16,000 units of Y × 100 + 9,600 units of Z × 40
= ***₹28,48,000***

### Working notes:

### (1) Calculation of total available labour hours in department A:

Total available labour hours = 10,000 units of X × 6 hours + 12,000 units of Y × 10 hours + 20,000 units of Z × 5 hours
= 2,80,000 hours

### (2) Calculation of Contribution per labour hour of department A and Rank:

| Particulars | X | Y | Z |
|---|---|---|---|
| Sale price per unit | 312 | 400 | 240 |
| Less: Direct materials per unit | 160 | 120 | 80 |
| Less: Variable overheads per unit | 8 | 20 | 12 |
| Less: Wages per unit: | | | |
| Department A | 24<br>(6 × 4) | 40<br>(10 × 4) | 20<br>(5 × 4) |
| Department B | 48<br>(6 × 8) | 120<br>(15 × 8) | 88<br>(11 × 8) |
| Contribution per unit<br>÷ Labour hours per unit of Dept. A | 72<br>÷ 6 | 100<br>÷ 10 | 40<br>÷ 5 |
| Contribution per labour hour Dept. A | 12 | 10 | 8 |
| **Rank** | **I** | **II** | **III** |

## BQ 42

ABC Limited produces and sells two product X and Y. The product is highly demanded in the market. Following information relating to both the products are given as under:

| Particulars | Per Unit (₹) | |
|---|---|---|
| | X | Y |
| Direct Materials | 140 | 180 |
| Direct Wages | 60 | 100 |
| Variable Overheads (₹5 per machine hour) | 20 | 40 |
| Selling price | 300 | 450 |

The company is facing scarcity of machine hours for working. The availability of machine hours are limited to 60,000 hours in a month. At present, the monthly demand of product X and product Y is 8,000 units and 6,000 units respectively. The fixed expenses of the company are ₹2,25,000 per month.

***Determine the product mix that generates maximum profit to the company in the given situation and also Calculate the profit of the company.***

## Answer

### Statement Showing Best Possible Mix of ABC Ltd.

| Rank | Product | Units/Mix | Machine hours |
|---|---|---|---|
| I | Product X | 8,000 | 32,000 |
| II | Product Y (28,000 ÷ 8) | 3,500 | 28,000 (b.f.) |
| **Total** | | **11,500** | **60,000** |

***Calculation of Profit from best possible mix:***

Profit = Contribution – Fixed cost
= (8,000 units of X × 80 + 3,500 units of Y × 130) - ₹2,25,000 = ***₹8,70,000***

***Working note:***

***(1) Calculation of Contribution per machine hour and Rank:***

| Particulars | Y | Z |
|---|---|---|
| Sale price per unit | 300 | 450 |
| Less: Direct materials per unit | 140 | 180 |
| Less: Direct wages | 60 | 100 |
| Less: Variable overheads per unit | 20 | 40 |
| Contribution per unit | 80 | 130 |
| ÷ Machine hours per unit (20÷5) and (40÷5) | ÷ 4 | ÷ 8 |
| Contribution per machine hour | 20 | 16.25 |
| ***Rank*** | ***I*** | ***II*** |

## BQ 43

X Ltd. supplies spare parts to an air craft company Y Ltd. The production capacity of X Ltd. facilitates production of any one spare part for a particular period of time. The following are the cost and other information for the production of the two different spare parts A and B:

| *Per unit* | *Part A* | *Part B* |
|---|---|---|
| Alloy usage | 1.6 kgs. | 1.6 kgs. |
| Machine Time: Machine A | 0.6 hrs. | 0.25 hrs. |
| Machine Time: Machine B | 0.5 hrs. | 0.55 hrs. |
| Target Price (₹) | 145 | 115 |

Total hours available for Machine A: 4,000 hours and for Machine B: 4,500 hours. Alloy available is 13,000 kgs @ ₹12.50 per kg. Variable overheads per machine hours for Machine A: ₹80 and for Machine B: ₹100

***Required***

1. Identify the spare part which will optimize contribution at the offered price.
2. If Y Ltd. reduces target price by 10% and offers ₹ 60 per hour of unutilized machine hour, what will be the total contribution from the spare part identified above?

***Answer***

***1. Statement Showing Optimum Contribution***

| Particulars | Part A | Part B |
|---|---|---|
| Maximum units to be manufactured and sold | 6,666 | 8,125 |
| Sales Price | 145 | 115 |
| Less: Materials 1.60 kgs. @ ₹12.50 per kg | 20 | 20 |
| Variable overheads Machine A 0.6/.25 hour @ ₹80 | 48 | 20 |
| Variable overheads Machine B 0.5/.55 hour @ ₹100 | 50 | 55 |
| ***Contribution per unit*** | ***27*** | ***20*** |
| ***Maximum Contribution (Contribution per unit × Max. units)*** | ***1,79,982*** | ***1,62,500*** |

***Calculation of maximum number of units that can be produced under various limiting factor:***

| Particulars | Part A | Part B |
|---|---|---|
| Machine A (4,000 hours) | 6,666<br>(4,000 ÷ 0.6) | 16,000<br>(4,000 ÷ 0.25) |

| | | |
|---|---|---|
| Machine B (4,500 hours) | 9,000<br>(4,500 ÷ 0.5) | 8,181<br>(4,500 ÷ 0.55) |
| Alloy Available (13,000 kg.) | 8,125<br>(13,000 ÷ 1.6) | 8,125<br>(13,000 ÷ 1.6) |
| ***Maximum number of part to be manufactured (least of all)*** | ***6,666*** | ***8,125*** |

***Spare Part A will optimize the contribution.***

### *2. Statement Showing Revised Contribution*

| ***Particulars*** | ***Part A*** |
|---|---|
| Parts to be manufactured | 6,666 |
| Machine A to be used (0.6 × 6,666) | 4,000 |
| Machine B to be used (0.5 × 6,666) | 3,333 |
| Underutilized machine hours (4,500 – 3,333) | 1,167 |
| Compensation for unutilized machine hours (1,167 × ₹60) | 70,020 |
| Reduction in price by 10% (6,666 × 145 × 10%) | 96,657 |
| ***Total revised contribution (1,79,982 + 70,020 – 96,657)*** | ***1,53,345*** |

## *BQ 44*

A company can make any one of the 3 products X, Y or Z in a year. It can exercise its option only at the beginning of each year. Fixed cost for the period is ₹30,000, Relevant information about the products for the next year is given below:

| ***Details*** | ***X*** | ***Y*** | ***Z*** |
|---|---|---|---|
| Selling price per unit (₹) | 10 | 12 | 12 |
| Variable cost per unit (₹) | 6 | 9 | 7 |
| Market demand in units | 3,000 | 2,000 | 1,000 |
| Production capacity in units | 2,000 | 3,000 | 900 |

***Compute the opportunity costs for each of the products.***

## *Answer*

### *Statement Showing Opportunity Cost*

| ***Details*** | ***X*** | ***Y*** | ***Z*** |
|---|---|---|---|
| Contribution per unit (₹) | 4 | 3 | 5 |
| Units<br>(lower of market demand or production capacity) | 2,000 | 2,000 | 900 |
| Possible contribution (₹) | 8,000 | 6,000 | 4,500 |
| Opportunity cost (₹) | 6,000 | 8,000 | 8,000 |

Opportunity cost is the maximum possible contribution forgone by not producing alternative product i.e. if Product X is produced then opportunity cost will be maximum of (₹ 6,000 from Y, ₹ 4,500 from Z).

# *MAKE OR BUY DECISION*

## *BQ 45*

NN Ltd. manufactures automobiles accessories and parts. The following are the total cost of processing 2,00,000 units:

| | |
|---|---|
| Direct material cost | ₹375 per unit |
| Direct labour cost | ₹80 per unit |
| Variable factory overhead | ₹16 per unit |
| Fixed factory overhead | ₹500 Lakhs |

The purchase price of the component is ₹485. The fixed overhead would continue to be incurred even when the component is bought from outside.

***Required:***

**(a)** Should the part be made or bought from outside considering that the present facility when released following a buying decision would remain idle?

**(b)** In case the released capacity can be rented out to another manufacturer for ₹32,00,000 having good demand. What should be the decision?

### Answer

**(a) *Make or Buy decision when present facility would remain idle:***

| | | | | |
|---|---|---|---|---|
| Variable cost per unit | = | ₹375 + ₹80 + ₹16 | = | ₹471 |
| Buying cost of component | = | ₹485 | | |

***Decision:*** Here the variable cost of making the component is ₹471 as compared to buying cost of ₹485. The component shall be made by using own production facility as it would save the company ₹14 per unit.

***Note:*** The fixed cost of ₹500 lakhs is irrelevant for decision making as it would incur in either case.

**(b) *Make or Buy decision when present facility can be rented out:***

| | | | | |
|---|---|---|---|---|
| Rental income if we buy | = | ₹32,00,000 | | |
| Additional cost of buying | = | (₹485 - ₹471) × 2,00,000 units | = | ₹28,00,000 |
| Net benefit if we buy | = | ₹32,00,000 - ₹28,00,000 | = | ₹4,00,000 |

***Decision:*** The component should be bought from outside as it would save the company ₹4,00,000 in fixed cost.

## *PROCESSING OF SPECIAL ORDER*

### *BQ 46*

PQR Ltd. manufactures medals for winners of athletic events and other contests. Its manufacturing plant has the capacity to produce 10,000 medals each month. The company has current production and sales level of 7,500 medals per month. The current domestic market price of the medal is ₹150. The cost data for the month of August 2023 is as under:

| | ***(₹)*** |
|---|---|
| Variable cost: | |
| Direct material cost | 2,62,500 |
| Direct labour cost | 3,00,000 |
| Overheads | 75,000 |
| Fixed manufacturing cost | 2,75,000 |
| Fixed marketing cost | 1,75,000 |
| ***Total cost*** | ***10,87,500*** |

PQR Ltd. has received a special onetime only order for 2,500 medals at ₹120 per medal.

***Required:***

**(1)** Should PQR Ltd. accept the special order? Why? Explain briefly.

**(2)** Suppose the plant capacity was 9,000 medals instead of 10,000 medals each month. The special order must be taken either in full or rejected totally. Analyse whether PQR Ltd. should accept the special order or not.

### Answer

***(1) Profit if we accept special order of 2,500 units with capacity of 10,000 units:***

| ***Particulars*** | | ***Amount (₹)*** |
|---|---|---|
| Sales | (7,500 units × ₹150) + (2,500 units × ₹120) | 14,25,000 |
| Less: Variable Cost: | | |
| Direct material cost | (2,62,500 × 10,000/7,500) | 3,50,000 |
| Direct labour cost | (3,00,000 × 10,000/7,500) | 4,00,000 |
| Overheads | (75,000 × 10,000/7,500) | 1,00,000 |
| ***Contribution*** | | ***5,75,000*** |

| | |
|---|---|
| Less: Fixed manufacturing cost<br>Less: Fixed marketing cost | 2,75,000<br>1,75,000 |
| ***Proposed Profit*** | ***1,25,000*** |

***Decision:*** The offer for 2,500 units be accepted as it increases the profit by ₹87,500 (₹1,25,000 – ₹37,500).

***(2) Profit if we accept special order of 2,500 units with capacity of 9,000 units:***

| ***Particulars*** | | ***Amount (₹)*** |
|---|---|---|
| Sales | (6,500 units × ₹150) + (2,500 units × ₹120) | 12,75,000 |
| Less: Variable Cost: | | |
| Direct material cost | (2,62,500 × 9,000/7,500) | 3,15,000 |
| Direct labour cost | (3,00,000 × 9,000/7,500) | 3,60,000 |
| Overheads | (75,000 × 9,000/7,500) | 90,000 |
| ***Contribution*** | | ***5,10,000*** |
| Less: Fixed manufacturing cost | | 2,75,000 |
| Less: Fixed marketing cost | | 1,75,000 |
| ***Proposed Profit*** | | ***60,000*** |

***Decision:*** The offer for 2,500 units be accepted as it increases the profit by ₹22,500 (₹60,000 – ₹37,500).

***Working note:***

***Existing profit at 7,500 units***

| ***Particulars*** | | ***Amount (₹)*** |
|---|---|---|
| Sales | (7,500 units × ₹150) | 11,25,000 |
| Less: Variable Cost: | | |
| Direct material cost | | 2,62,500 |
| Direct labour cost | | 3,00,000 |
| Overheads | | 75,000 |
| ***Contribution*** | | ***4,87,500*** |
| Less: Fixed manufacturing cost | | 2,75,000 |
| Less: Fixed marketing cost | | 1,75,000 |
| ***Existing Profit*** | | ***37,500*** |

## *ABSORPTION COSTING V/S MARGINAL COSTING*

### *BQ 47*

XYZ Ltd. has a production capacity of 2,00,000 units per year normal capacity utilization is reckoned as 90%. Standard variable production costs are ₹11 per unit. The fixed costs are ₹3,60,000 per year. Variable selling costs are ₹3 per unit & fixed selling costs are ₹2,70,000 per year. The unit selling price is ₹20. In the year just ended on 30th June 2023, the production was 1,60,000 units & sales were 1,50,000 units. The closing inventory on 30th June 2023 was 20,000 units. The actual variable production costs for the year were ₹35,000 higher than the standard.

***Calculate the profit for the year:***

***(a)*** By the absorption costing method,
***(b)*** By the marginal costing method,
***(c)*** Explain the difference in the profits.

### *Answer*

***(a) Income Statement (Under Absorption Costing)***

| ***Particulars*** | | ***₹*** |
|---|---|---|
| Sales (1,50,000 units @ ₹20) | | 30,00,000 |
| Production costs: | | |
| Variable (1,60,000 units @ ₹11) | 17,60,000 | |
| Add :Increase | 35,000 | 17,95,000 |
| Fixed (1,60,000 units @ ₹2*) | | 3,20,000 |

| | |
|---|---|
| ***Cost of Goods Produced*** | ***21,15,000*** |
| ***Add:*** Opening stock (10,000 Units @ ₹13*) | 1,30,000 |
| ***Less:*** Closing stock $\left(\frac{21,15,000}{1,60,000} \times 20,000 \text{ units}\right)$ | (2,64,375) |
| ***Cost of Goods Sold*** | ***19,80,625*** |
| ***Add:*** Under absorbed fixed production overhead (3,60,000-3,20,000) | 40,000 |
| ***Add:*** Variable selling costs (1,50,000 units @ ₹3) | 4,50,000 |
| ***Add:*** Fixed selling costs | 2,70,000 |
| ***Total cost*** | ***27,40,625*** |
| ***Profit (Sales – Total Cost)*** | ***2,59,375*** |

### *(b) Income Statement (Under Marginal Costing)*

| ***Particulars*** | | ***₹*** |
|---|---|---|
| Sales (1,50,000 units @ ₹20) | | 30,00,000 |
| Variable cost of goods sold: | | |
| Variable production cost (1,60,000 units @ ₹11 + ₹35,000) | | 17,95,000 |
| ***Variable cost of production*** | | ***17,95,000*** |
| ***Add:*** Opening Stock (10,000 units @ ₹11) | | 1,10,000 |
| ***Less:*** Closing stock $\left(\frac{17,95,000}{1,60,000} \times 20,000 \text{ units}\right)$ | | (2,24,375) |
| ***Variable cost of goods sold*** | | ***16,80,625*** |
| Variable selling cost (1,50,000 units @ ₹3) | | 4,50,000 |
| ***Variable Cost of Sales*** | | ***21,30,625*** |
| ***Contribution (Sales - Variable Cost of Sales)*** | | ***8,69,375*** |
| ***Less:*** Fixed cost: | | |
| Production | 3,60,000 | |
| Selling | 2,70,000 | (6,30,000) |
| ***Profit (Contribution – Fixed Cost)*** | | ***2,39,375*** |

***Working Notes:***

- Fixed production overhead are absorbed at a pre-determined rate based on normal capacity, i.e. ₹3,60,000 ÷ 1,80,000 units = ₹2 per unit
- Opening stock is 10,000 units (1,50,000 units + 20,000 units - 1,60,000 units). It is valued at ₹13 per unit [₹11 + ₹2 (standard variable + standard fixed)].

### *(c) Reconciliation Statement*

| ***Particulars*** | ***₹*** |
|---|---|
| Profit as per absorption costing | 2,59,375 |
| Add: Opening stock under-valued in marginal costing (₹1,30,000 – ₹1,10,000) | 20,000 |
| Less: Closing Stock under-valued in marginal closing (₹2,64,375 – ₹2,24,375) | (40,000) |
| ***Profit as per marginal costing*** | ***2,39,375*** |

### *BQ 48*

Wonder ltd manufactures a single product, ZEST. The following figures relate to ZEST for a one year period:

| ***Activity Level*** | ***50%*** | ***100%*** |
|---|---|---|
| Sales and production (units) | 400 | 800 |
| Sales | ₹8,00,000 | ₹16,00,000 |
| Production costs: | | |
| Variable | ₹3,20,000 | ₹6,40,000 |
| Fixed | ₹1,60,000 | ₹1,60,000 |
| Selling and distribution costs: | | |
| Variable | ₹1,60,000 | ₹3,20,000 |
| Fixed | ₹2,40,000 | ₹2,40,000 |

The normal level of activity for the year is 800 units. Fixed costs are incurred evenly throughout the year and actual fixed costs are the same as budgeted. There were no stocks of ZEST at the beginning of the year. In the first quarter, 220 units were produced and 160 units were sold.

***Required:***

***(a)*** What would be the fixed production costs absorbed by ZEST if absorption costing is used?
***(b)*** What would be the under/over-recovery of overheads during the period?
***(c)*** What would be the profit using absorption costing?
***(d)*** What would be the profit using marginal costing?
***(e)*** Why is there a difference between the answers to ***(c)*** and ***(d)***?

## *Answer*

***(a)*** ***Fixed production costs absorbed:***

| | |
|---|---|
| Budgeted fixed production costs | ₹1,60,000 |
| Budgeted output (Normal level of activity 800 units) | |
| Therefore, the absorption rate (₹1,60,000 ÷ 800) | ₹200 per unit |
| ***Fixed cost recovered (During the first quarter, 220 units × ₹200)*** | ***₹44,000*** |

***(b)*** ***Under/over-recovery of overheads during the period:***

| | |
|---|---|
| Actual fixed production overhead (¼ of ₹1,60,000) | ₹40,000 |
| Absorbed fixed production overhead | ₹44,000 |
| ***Over-recovery of overheads*** | ***₹4,000*** |

### *(c) Profit for the Quarter (Absorption Costing)*

| ***Activity Level*** | ***₹*** | ***₹*** |
|---|---|---|
| Sales revenue (160 units × ₹2,000) | | 3,20,000 |
| Production costs: | | |
| Variable (220 units × ₹800) | 1,76,000 | |
| Fixed overheads absorbed (220 units × ₹200) | 44,000 | 2,20,000 |
| ***Cost of production*** | | ***2,20,000*** |
| Add: Opening stock | | Nil |
| Less: Closing stock (₹2,20,000 ÷ 220 units) × 60 units | | (60,000) |
| ***Cost of goods sold*** | | ***1,60,000*** |
| Less: Adjustment for over recovery of fixed overheads | | (4,000) |
| Add: Selling and distribution costs: | | |
| Variable (160 units × ₹400) | 64,000 | |
| Fixed (¼ of ₹2,40,000) | 60,000 | 1,24,000 |
| ***Cost of sales*** | | ***2,80,000*** |
| ***Profit (Sales – Cost of sales)*** | | ***40,000*** |

### *(d) Profit for the Quarter (Marginal costing)*

| ***Activity Level*** | ***₹*** | ***₹*** |
|---|---|---|
| Sales revenue (160 units × ₹2,000) | | 3,20,000 |
| Production costs: | | |
| Variable (220 units × ₹800) | | 1,76,000 |
| ***Cost of production*** | | ***1,76,000*** |
| Add: Opening stock | | Nil |
| Less: Closing stock (₹1,76,000 ÷ 220 units) × 60 units | | (48,000) |
| ***Cost of goods sold*** | | ***1,28,000*** |
| Add: Selling and distribution costs: | | |
| Variable (160 units × ₹400) | | 64,000 |
| ***Cost of sales*** | | ***1,92,000*** |
| ***Contribution (Sales – Variable Cost of sales)*** | | ***1,28,000*** |
| Less: Fixed costs: | | |
| Production | 40,000 | |
| Selling & distribution | 60,000 | (1,00,000) |
| ***Profit*** | | ***28,000*** |

***(e) Difference in profit between both techniques is due to difference in valuation of closing stock:***

| | |
|---|---|
| Profit as per Marginal costing | 28,000 |
| Add: under valuation of closing stock in marginal costing (60,000 – 48,000) | 12,000 |
| Profit as per Absorption costing | ***40,000*** |

## *OTHERS*

### *BQ 49*

A company is considering four alternative proposals for a new toy manufacturing Machine launched in the market. New machine is expected to produce approximately 25,000 toys every year. The proposals are as follows:

***(a)*** Purchase and maintain the new toy manufacturing Machine and bear all related costs. These machines will run on fuel. The average cost of a Machine is ₹10,00,000. Life of the machine is 4 years with annual production of 25,000 toys and the Resale value is ₹2,00,000 at the end of the fourth year.

***(b)*** Hire from Agency-A: It can hire the machine from the Agency-A and pay hire charges at the rate of ₹20 per toy and bear no other cost.

***(c)*** Hire from Agency-B: It can hire the machine from the Agency-B and pay hire charges at the rate of ₹12 per toy and also bear insurance costs. All other costs will be borne by Agency-B.

***(d)*** Hire from Agency-C: Hire machine from Agency-C at ₹2,50,000 per year. These machines are more advanced and run on electricity and therefore, the running cost is considerably low. The company will have to bear costs of electricity, licensing fees and spare parts. However, Repairs and maintenance and Insurance cost are borne by Agency-C.

***The following further details are available:***

The cost of Fuel is ₹8 per toy, the cost of spare parts is ₹0.20 per toy and the cost of electricity is ₹2 per toy. Further, the cost of Repairs and maintenance is ₹0.25 per toy, the amount of licensing fees to be paid is ₹5,000 per machine per annum and the cost of Insurance to be paid is ₹25,000 per machine per annum. Consider no taxes.

***You are required to:***

***(1)*** Calculate the relative costs of four proposals on cost per toy basis.
***(2)*** Rank the proposals on the basis of total cost for 25,000 toys per year.
***(3)*** Recommend the best proposal to company in view of (2) above.

### *Answer*

***(1) Statement Showing Relative Costs of Proposals***

| ***Particulars*** | ***Purchase of machine*** | ***Hire Agency A*** | ***Hire Agency B*** | ***Hire Agency C*** |
|---|---|---|---|---|
| Depreciation (₹10,00,000 – ₹2,00,000) ÷ 4 years | 2,00,000 | - | - | - |
| Hire charges (25,000 × ₹20 or ₹12) | - | 5,00,000 | 3,00,000 | 2,50,000 |
| Cost of fuel (25,000 × ₹8) | 2,00,000 | - | - | - |
| Cost of spare parts (25,000 × ₹0.2) | 5,000 | - | - | 5,000 |
| Cost of electricity (25,000 × ₹2) | - | - | - | 50,000 |
| Repairs & maintenance (25,000 × ₹0.25) | 6,250 | - | - | - |
| License fees | 5,000 | - | - | 5,000 |
| Insurance cost | 25,000 | - | 25,000 | - |
| ***Total Cost*** | ***4,41,250*** | ***5,00,000*** | ***3,25,000*** | ***3,10,000*** |
| ***Cost Per Toy (Total Cost ÷ 25,000 toys)*** | ***17.65*** | ***20.00*** | ***13.00*** | ***12.40*** |

***(2) Ranking of Proposals:***

| | | |
|---|---|---|
| Purchase of Machine | = | Rank 3 |
| Hire from Agency A | = | Rank 4 |

Hire from Agency B = Rank 2
Hire from Agency C = Rank 1

**(3) Recommendation:** Proposal of Hire machine from Agency-C is acceptable as the cost of manufacturing toys is lowest.

## BQ 50

Arnav Ltd. manufacture and sales its product R9. The following figures have been collected from cost records of last year for the product R9:

| Elements of Cost | Variable Cost Portion | Fixed Cost |
|---|---|---|
| Direct Material | 30% of Cost of Goods Sold | - |
| Direct Labour | 15% of Cost of Goods Sold | - |
| Factory Overhead | 10% of Cost of Goods Sold | ₹2,30,000 |
| Administration Overhead | 2% of Cost of Goods Sold | ₹71,000 |
| Selling and Distribution Overhead | 4% of Cost of Sales | ₹68,000 |

Last Year 5,000 units were sold at ₹185 per unit. From the given data find the followings:

*(a)* Break-even Sales (in rupees),
*(b)* Profit earned during last year,
*(c)* Margin of safety (in %),
*(d)* Profit if the sales were 10% less than the actual sales.
(Assume that Administration Overhead is related with production activity)

### Answer

*(a)* Break-even Sales = Fixed Cost ÷ PV Ratio
= ₹3,69,000 ÷ 53.4054% = ***₹6,90,941***

*(b)* Profit Last Year = Sales – Variable Cost - Fixed Cost
= 5,000 units × ₹185 – ₹4,31,000 – ₹3,69,000 = ***₹1,25,000***

*(c)* Margin of safety (%)

Margin of Safety = Sales – BEP Sales
= ₹9,25,000 – ₹6,90,941 = ***₹2,34,059***

Margin of Safety (%) = MOS Sales ÷ Sales
= ₹2,34,059 ÷ ₹9,25,000 = ***25.3036%***

*(d)* Profit at 90% Sales = 90% of Sales – 90% of Variable Cost - Fixed Cost
= 90% (₹9,25,000 – ₹4,31,000) – ₹3,69,000 = ***₹75,600***

### Working notes:

**1.** Cost of Goods Sold = Direct Material + Direct Labour + Factory OH + Administration OH
= 30% COGS + 15% COGS + 10% COGS + ₹2,30,000 + 2% COGS +₹71,000

Cost of Goods Sold = 57% of COGS + ₹3,01,000 or 43% of COGS = ₹3,01,000

Cost of Goods Sold = ₹3,01,000 ÷ 43% = ***₹7,00,000***

**2.** Cost of Sales = COGS + Selling and Distribution Overheads
= ₹7,00,000 + 4% of Cost of Sales + ₹68,000

Cost of Sales = ₹7,68,000 ÷ 96% = ***₹8,00,000***

**3. *Classification of Fixed and Variable Cost***

| Elements of Cost | Variable Cost Portion | Fixed Cost |
|---|---|---|
| Direct Material | 30% of ₹7,00,000 = ₹2,10,000 | - |
| Direct Labour | 15% of ₹7,00,000 = ₹1,05,000 | - |

| | | |
|---|---|---|
| Factory Overhead | 10% of ₹7,00,000 = ₹70,000 | ₹2,30,000 |
| Administration Overhead | 2% of ₹7,00,000 = ₹14,000 | ₹71,000 |
| Selling and Distribution Overhead | 4% of ₹8,00,000 = ₹32,000 | ₹68,000 |
| ***Total*** | ***₹4,31,000*** | ***₹3,69,000*** |

***4.*** Profit Volume Ratio $= \dfrac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} \times 100 = \dfrac{5{,}000 \text{ units} \times 185 - 4{,}31{,}000}{5{,}000 \text{ units} \times 185} \times 100$

$=$ ***53.4054%***

### *BQ 51*

A company manufactures two types of herbal product, A and B. its budget shows profit figures after apportioning the fixed joint cost of ₹15 Lakhs in the proportion of the numbers of units sold. The budget for 2023, indicates:

| | *A* | *B* |
|---|---|---|
| Profit | ₹2,10,000 | (₹30,000) |
| Selling Price per unit | ₹200 | ₹120 |
| P/V ratio | 40% | 50% |

***Compute the best option among the following, if the company expects that the number of units to be sold would be equal:***

*(a)* Due to exchange in a manufacturing process, the joint fixed cost would be reduced by 15% and the variables would be increased by 7.5%.

*(b)* Price of A could be increased by 20% as it expected that the price elasticity of demand would be unity over the range of price.

*(c)* Simultaneous introduction of both the option, viz, (a) and (b) above.

### *Answer*

***(a) Statement of Increase in Profit Under Option a***

| ***Particulars*** | ***Amount*** |
|---|---|
| Revised contribution of A with 7.5% increase in VC {(12,000 units × (₹200 – ₹129)} | 8,52,000 |
| Revised contribution of B with 7.5% increase in VC {(12,000 units × (₹120 – ₹64.50)} | 6,66,000 |
| Total Revised Contribution | 15,18,000 |
| Less: Fixed cost with 15% reduction (₹15,00,000 – 15%) | (12,75,000) |
| ***Revised Profit*** | ***2,43,000*** |
| ***Increase in Profit (₹2,43,000 – ₹1,80,000)*** | ***63,000*** |

***(b) Statement of Increase in Profit Under Option b***

| ***Particulars*** | ***Total*** |
|---|---|
| Budgeted revenue from Product A (12,000 units × ₹200) | 24,00,000 |
| Revised demand (in units) (24,00,000 ÷ ₹240) | 10,000 |
| Revised contribution of A with 20% increase in Price {(10,000 units × (₹240 – ₹120)} | 12,00,000 |
| Less: Existing contribution from product A {(12,000 units × (₹200 – ₹120)} | (9,60,000) |
| ***Increase in Contribution of Product A/Profit*** | ***2,40,000*** |

***Note:*** Since price elasticity of demand is 1, therefore the revenue in respect of products will remain same.

***(c) Statement of Increase in Profit Under Option c***

| ***Particulars*** | ***Amount*** |
|---|---|
| Revised contribution of A {(10,000 units × (₹240 – ₹129)} | 11,10,000 |
| Revised contribution of B {(12,000 units × (₹120 – ₹64.50)} | 6,66,000 |
| Total Revised Contribution | 17,76,000 |
| Less: Fixed cost (₹15,00,000 – 15%) | (12,75,000) |
| ***Revised Profit*** | ***5,01,000*** |
| ***Increase in Profit (₹5,01,000 – ₹1,80,000)*** | ***3,21,000*** |

**Decision:** Option c is best among all options having increase in highest profit of ₹3,21,000 and highest total profit of ₹5,01,000.

**Working notes:**

**1. Contribution per unit:**

| | | | | |
|---|---|---|---|---|
| Product A | = | ₹200 × 40% | = | **₹80** |
| Product B | = | ₹120 × 50% | = | **₹60** |

**2. Number of units to be sold:**

Let x be number of units of each product sold

Now,

| | | | | |
|---|---|---|---|---|
| Total Profit | = | Total contribution – Fixed cost | | |
| ₹2,10,000 + (₹30,000) | = | (₹80x + ₹60x) – ₹15,00,000 | | |
| 140x | = | ₹16,80,000 | | |
| x | = | ₹16,80,000 ÷ 140 | = | **12,000 units of each product** |

## BQ 52

By noting "P/V will increase or P/V will decrease or P/V will not change", as the case may be, state how the following independent situations will affect the P/V ratio:

1. An increase in the physical sales volume;
2. An increase in the fixed cost;
3. A decrease in the variable cost per unit;
4. A decrease in the contribution margin;
5. An increase in selling price per unit;
6. A decrease in the fixed cost;
7. A 10% increase in both selling price and variable cost per unit;
8. A 10% increase in the selling price per unit and 10% decrease in the physical sales volume;
9. A 50% increase in the variable cost per unit and 50% decrease in the fixed cost.
10. An increase in the angle of incidence.

## Answer

| Item number | P/V Ratio | Reason |
|---|---|---|
| 1 | Will not change | - |
| 2 | Will not change | - |
| 3 | Will increase | - |
| 4 | Will decrease | - |
| 5 | Will increase | - |
| 6 | Will not change | - |
| 7 | Will not change | Reasoning 1 |
| 8 | Will increase | Reasoning 2 |
| 9 | Will decrease | Reasoning 3 |
| 10 | Will increase | Reasoning 4 |

**Reasoning 1:** A 10% increase in both selling price and variable cost per unit.

Assumptions: a) Variable cost is less than selling price.

b) Selling price ₹100 variable cost ₹ 90 per unit.

c) P/V ratio $= \frac{100-90}{100} =$ 10%

| | | |
|---|---|---|
| 10% increase in S.P. | = | ₹110 |
| 10% increase in variable cost | = | ₹99 |
| P/V ratio | = | 10% i.e. P/V ratio will not change |

**Reasoning 2:** Increase or decrease in physical sales volume will not change P/V ratio. Hence 10% increase in selling price per unit will increase P/V ratio.

***Reasoning 3:*** Increase or decrease in fixed cost will not change P/V ratio. Hence 50% increase in the variable cost per unit will decrease P/V ratio.

***Reasoning 4:*** Angle of incidence is the angle at which sales line cuts the total cost line. If it is large, it indicates that the profits are being made at higher rate. Hence increase in the angle of incidence will increase the P/V ratio.

### BQ 53

XY Ltd. makes two products X and Y, whose respective fixed costs are F1 and F2. You are given that the unit contribution of Y is one fifth less than the unit contribution of X, that the total of F1 and F2 is ₹1,50,000, that the BEP of X is 1,800 units (for BEP of X F2 is not considered) and that 3,000 units is the indifference point between X and Y. (i.e. X and Y make equal profits at 3,000 unit volume, considering their respective fixed costs). There is no inventory build up as whatever is produced is sold.

***Find out the values F1 and F2 and units contributions of X and Y.***

### Answer

Let Cx be the Contribution per unit of Product X.

Therefore, Contribution per unit of Product Y = Cy = ⅘ Cx = 0.8 Cx

| | | | | |
|---|---|---|---|---|
| Given F1 + F2 | = | 1,50,000, | | |
| F1 | = | 1,800 Cx (Break even Volume × Contribution per unit) | | |
| Therefore, F2 | = | 1,50,000 – 1,800 Cx | | |
| 3,000 Cx – F1 | = | 3,000 × 0.8 Cx – F2 or 3,000 Cx – F1 | | |
| | = | 2,400 Cx - F2 | | (Indifference Point) |
| i.e., 3,000 Cx – 1,800 Cx | = | 2,400 Cx – 1,50,000 + 1,800 Cx | | |
| i.e., 3,000 Cx | = | 1,50,000, | | |
| Cx | = | 1,50,000 ÷ 3,000 | = | ₹50 |
| Contribution per unit of X | = | ***₹50*** | | |
| Contribution per unit of Y | = | ₹50 × 0.8 | = | ***₹40*** |
| Fixed Cost of X | = | F1 | | |
| | = | 1,800 × 50 | = | ***₹90,000*** |
| Fixed Cost of Y | = | F2 | | |
| | = | 1,50,000 – 90,000 | = | ***₹60,000*** |

## GRAPHS

### BQ 54

ABC Ltd. manufacturing a single product, incurring variable costs of ₹300 per unit and fixed costs of ₹2,00,000 per month. If the product sells for ₹500 per unit calculate break-even point and prepare:

***(a)*** Break-even chart,

***(b)*** Contribution Break-even chart and

***(c)*** Profit-volume chart.

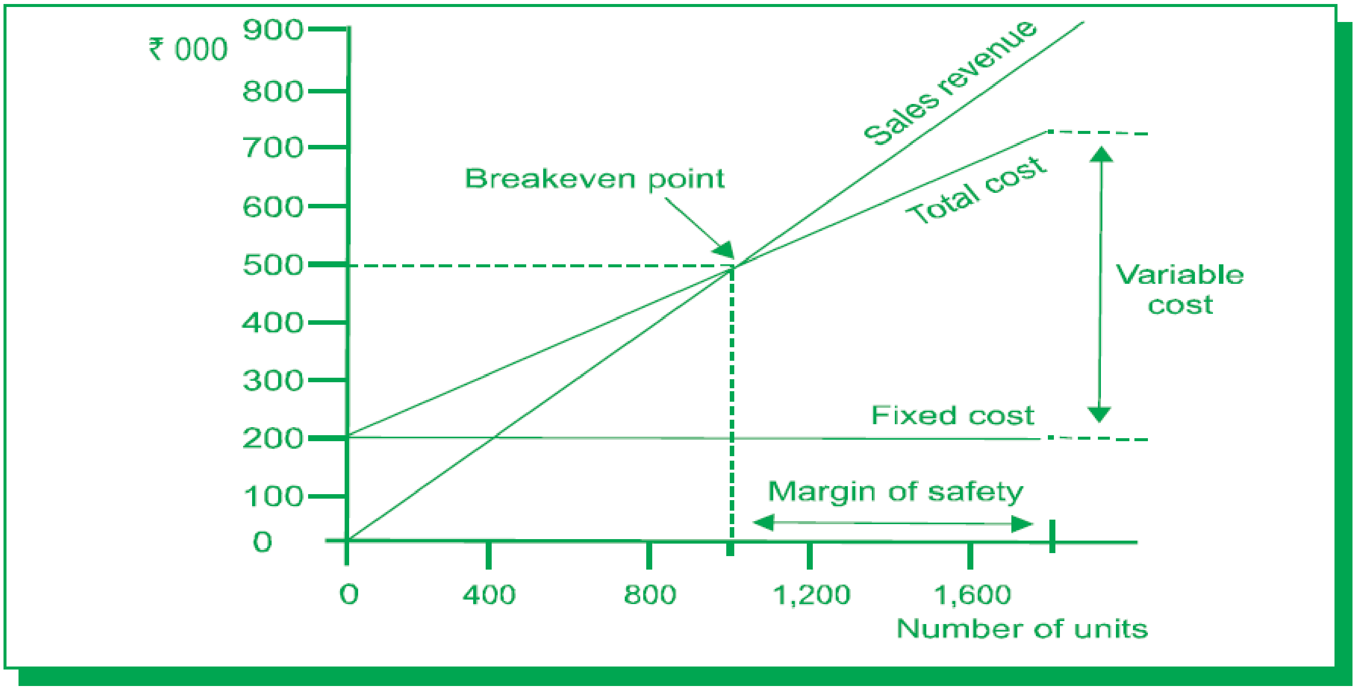
### Answer

| | | | | |
|---|---|---|---|---|
| Break even point (in units) | = | Fixed cost ÷ contribution per unit | | |
| | = | 2,00,000 ÷ 200 per unit (500 - 300) | = | ***1,000 units*** |
| Break even point (in amount) | = | Fixed cost ÷ profit volume ratio | | |
| | = | 2,00,000 ÷ 40%(200 ÷ 500) | = | ***₹5,00,000*** |

***(a) Break even chart:***

A breakeven chart records costs and revenues on the vertical axis and the level of activity on the horizontal axis. The making of the breakeven chart would require you to select appropriate axes. Subsequently, you will need to mark costs/revenues on the Y axis whereas the level of activity shall be traced on the X axis. Lines representing ***(i)*** Fixed costs (horizontal line at ₹2,00,000 for ABC Ltd), ***(ii)*** Total costs at maximum level of activity (joined to the Y-axis where the Fixed cost of ₹2,00,000 is marked) and ***(iii)*** Revenue at maximum level of activity (joined to the origin) shall be drawn next.

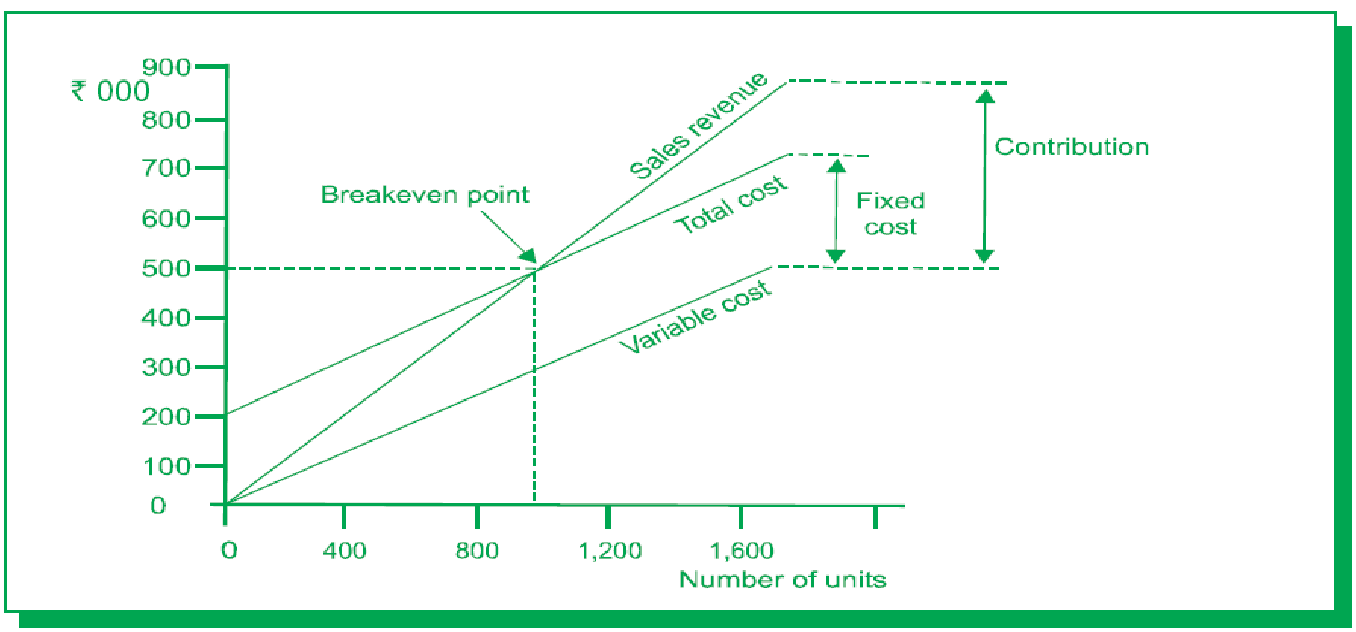
The breakeven point is that point where the sales revenue line intersects the total cost line. Other measures like the margin of safety and profit can also be measured from the chart.




***(b) Contribution Breakeven chart:***

It is not possible to use a breakeven chart as described above to measure contribution. This is one of its major limitations especially so because contribution analysis is literally the backbone of marginal costing. To overcome such a limitation, accountants frequently resort to the making of a contribution breakeven chart which is based on the same principles as a conventional breakeven chart except for that it shows the variable cost line instead of the fixed cost line. Lines for Total cost and Sales revenue remain the same. The breakeven point and profit can be read off in the same way as with a conventional chart. However, it is also possible to read the contribution for any level of activity.

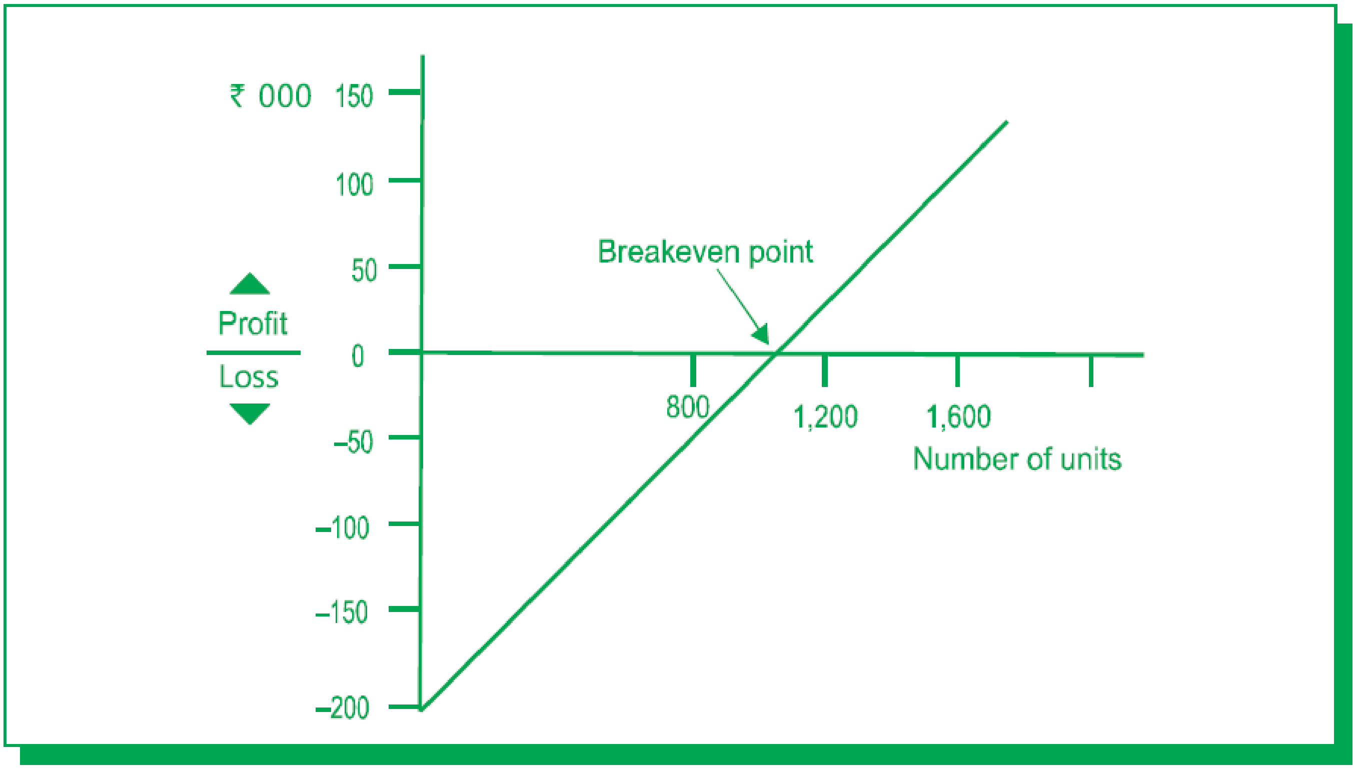
The contribution can be read as the difference between the sales revenue line and the variable cost line.




***(c) Profit-volume chart:***

This is also very similar to a breakeven chart. In this chart the vertical axis represents profits and losses and the horizontal axis is drawn at zero profit or loss. In this chart each level of activity is taken into account and profits marked accordingly. The breakeven point is where this line interacts the horizontal axis.

The loss at a nil activity level is equal to ₹2,00,000, i.e. the amount of fixed costs.




***BQ 55***

A manufacturing company incurs fixed costs of ₹3,00,000 per annum. It is a single product company with annual sales budgeted to be 70,000 units at a sales price of ₹300 per unit. Variable costs are ₹285 per unit.

***(i)*** Draw a profit volume graph, and use it to determine the breakeven point.

The company is deliberating upon an increase in the selling price of the product to ₹350 per unit. This shall be required in order to improve the quality of the product. It is anticipated that despite increase in the selling price the sales volume shall remain unaffected, however, the fixed costs shall increase to ₹4,50,000 per annum and the variable costs to ₹330 per unit.

***(ii)*** Draw on the same graph as for part ***(i)*** a second profit volume graph and give your comments.

***Answer***

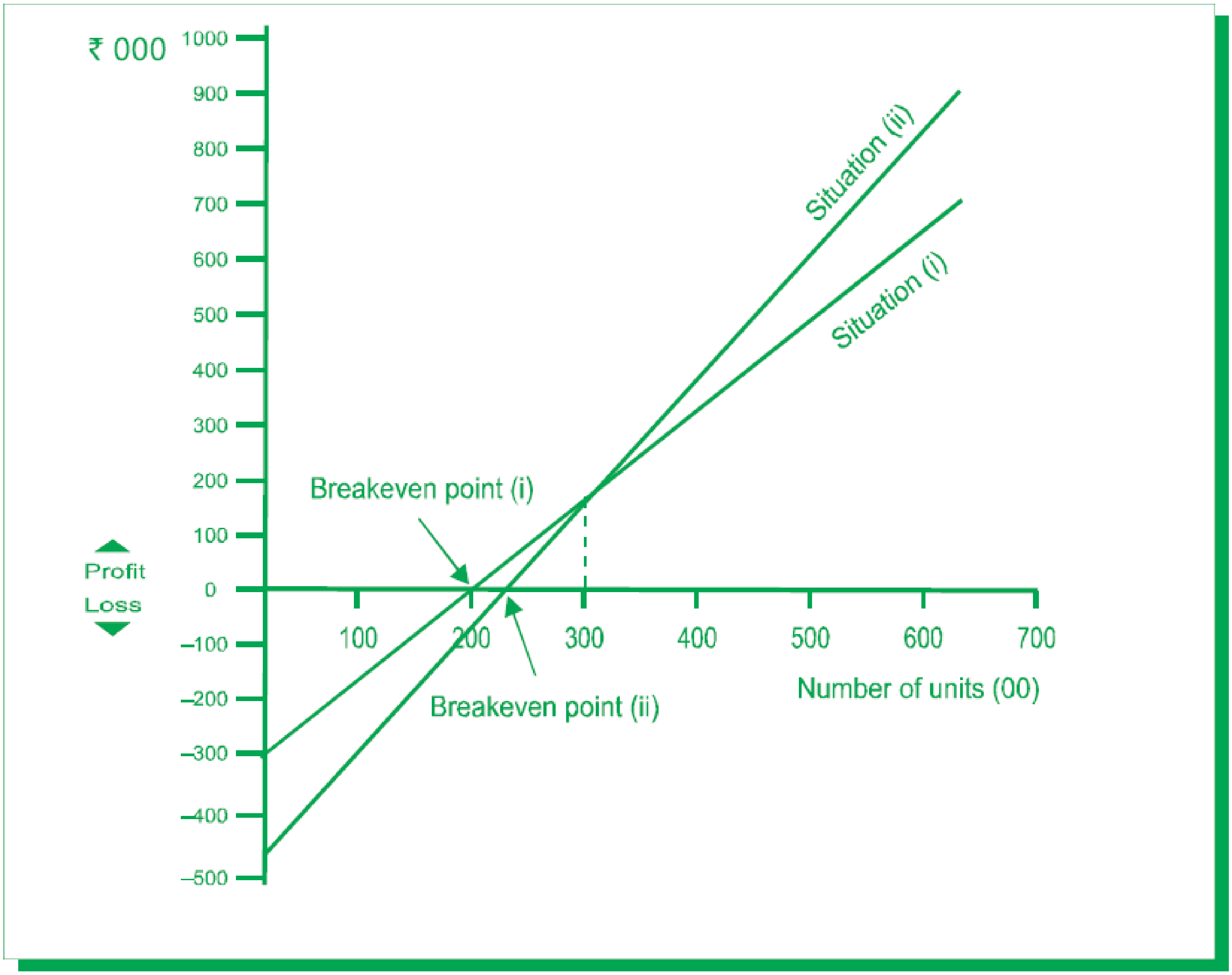
***Calculation of profit on sales in both the cases:***

| | | |
|---|---|---|
| Profit in case (i) | = | contribution – fixed cost |
| | = | 70,000 units × 15 (300 – 285) – 3,00,000 |
| | = | ***₹7,50,000*** |

***Starting point of situation (i) will be ₹3,00,000 (i.e. the fixed cost) loss at zero activity level***

| | | |
|---|---|---|
| Profit in case (ii) | = | contribution – fixed cost |
| | = | 70,000 units × 20 (350 – 330) – 4,50,000 |
| | = | ***₹9,50,000*** |

***Starting point of situation (ii) will be ₹4,50,000 (i.e. the fixed cost) loss at zero activity level***




***Comments:***

It is clear from the graph that there are larger profits available from option ***(ii)***. It also shows an increase in the break-even point from 20,000 units to 22,500 units, however, the increase of 2,500 units may not be considered large in view of the projected sales volume. It is also possible to see that for sales volumes above 30,000 units the profit achieved will be higher with option ***(ii)***. For sales volumes below 30,000 units option ***(i)*** will yield higher profits (or lower losses).

***BQ 56***

***You are given the following data for the year 2023 of Rio Co. Ltd:***

| | | |
|---|---|---|
| Variable cost | ₹60,000 | 60% |
| Fixed cost | ₹30,000 | 30% |
| Net profit | ₹10,000 | 10% |
| Sales | ₹1,00,000 | 100% |

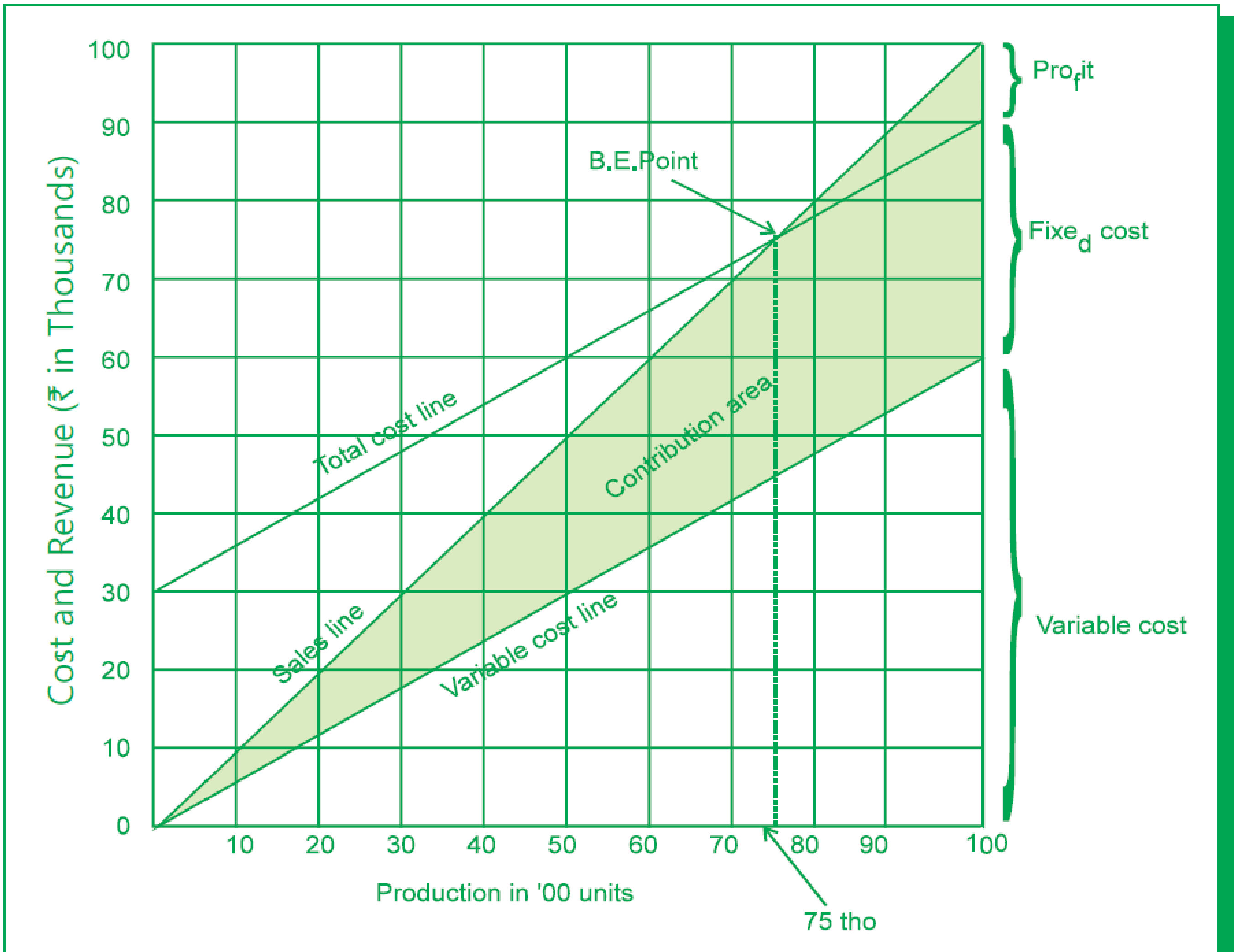
***Find out (a) Break-even point, (b) P/V ratio, and (c) Margin of safety. Also draw a breakeven chart showing contribution and profit.***

***Answer***

| | | | | | |
|---|---|---|---|---|---|
| ***(a)*** | Break even point | = | Fixed cost ÷ PV ratio | = | 30,000 ÷ 40% |
| | | = | ***₹75,000*** | | |
| ***(b)*** | P/V Ratio | = | 100% - Variable Cost Ratio | | |
| | | = | 100% - 60% | = | ***40%*** |
| ***(c)*** | Margin if safety | = | Sales – BEP sales | = | 1,00,000 – 75,000 |

= ₹25,000

*(d)* BEP chart showing contribution and profit:



Break-even chart

***BQ 57***

***Prepare a profit graph for products A, B and C and find break-even point from the following data:***

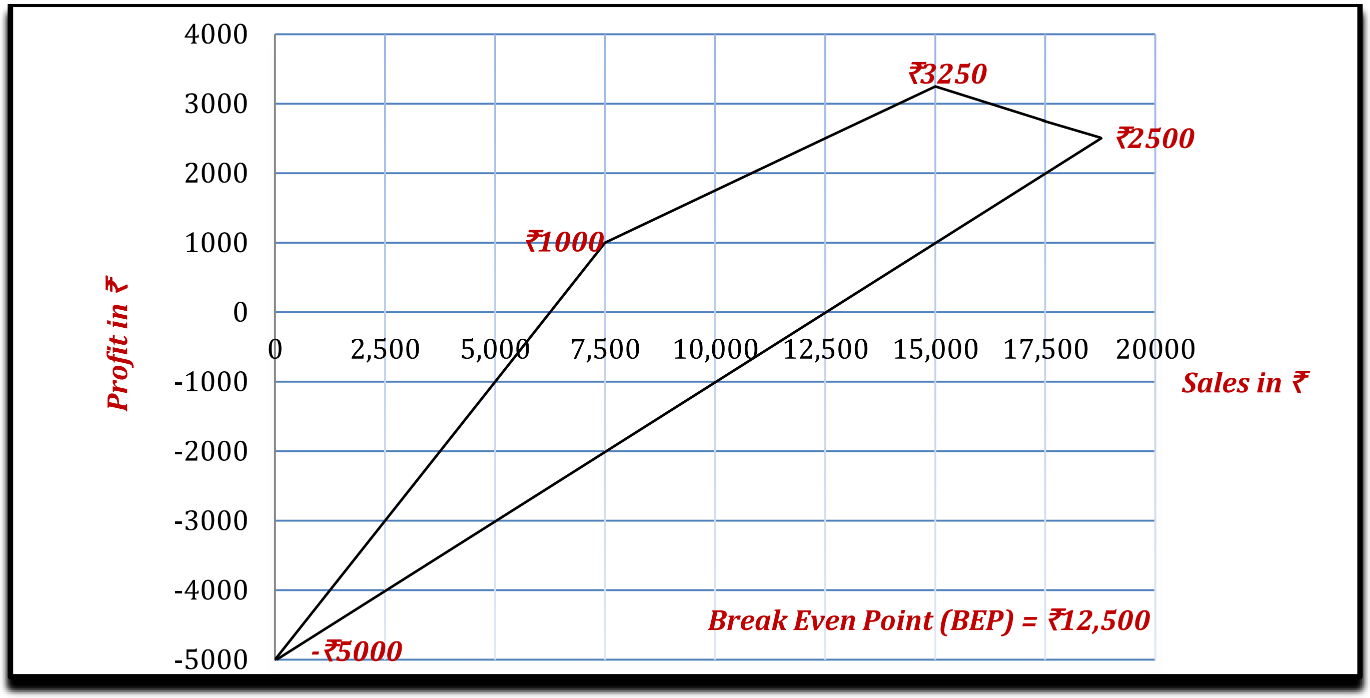
| Products | A | B | C | Total |
|---|---|---|---|---|
| Sales (₹) | 7,500 | 7,500 | 3,750 | 18,750 |
| Variable cost (₹) | 1,500 | 5,250 | 4,500 | 11,250 |
| Fixed cost (₹) | - | - | - | 5,000 |

***Answer***

***Statement Showing Cumulative Contribution and Profit***

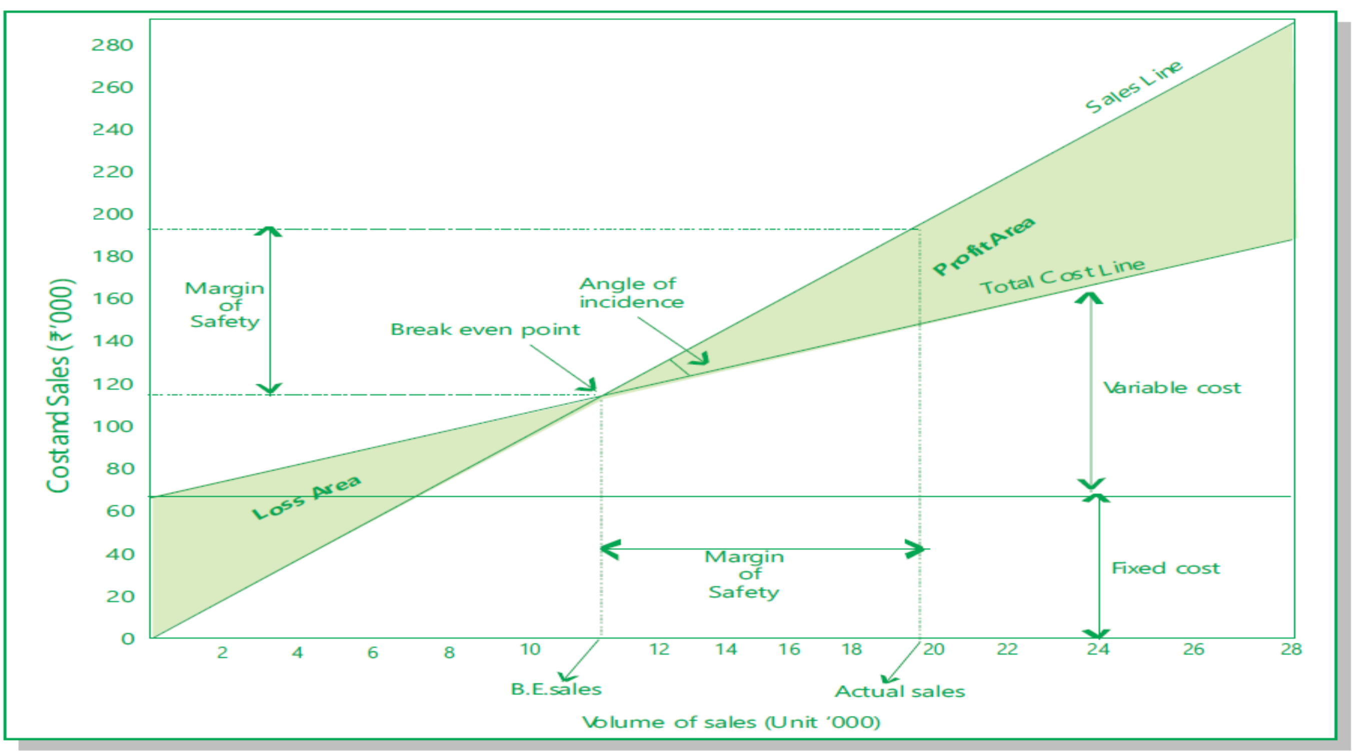
| Products | Sales (₹) | Cumulative Sales (₹) | Variable Cost (₹) | Contribution (₹) | Cumulative Contribution (₹) | Cumulative Profit (₹) |
|---|---|---|---|---|---|---|
| A | 7,500 | 7,500 | 1,500 | 6,000 | 6,000 | 1,000 |
| B | 7,500 | 15,000 | 5,250 | 2,250 | 8,250 | 3,250 |
| C | 3,750 | 1,8750 | 4,500 | (750) | 7,500 | 2,500 |

***Profit graph for product A, B and C and Break even point:***




***BQ 58***
***Define angle of incidence.***

***Answer***
This angle is formed by the intersection of sales line and total cost line at the breakeven point. This angle shows the rate at which profit is earned once the break-even point is reached. The wider the angle the greater is the rate of earning profits. A large angle of incidence with a high margin of safety indicates extremely favourable position. The shaded area in the graph given below is representing the angle of incidence. The angle above and below the break-even point shows the rate of earning profitability (loss). Wider angle denotes higher rate of earnings and vice-versa.



# *PAST YEAR QUESTIONS*

***PYQ 1***

A company has fixed cost of ₹90,000, Sales ₹3,00,000 and Profit of ₹60,000.

***Required:***

***(i)*** Sales volume if in the net period, the company suffered a loss of ₹30,000.

***(ii)*** What is the margin of safety for a profit of ₹90,000?

***[(3 Marks) May 2008]***

***Answer***

***(i) Calculation of sales volume if there is loss of ₹30,000:***

$$\text{Sales} = \frac{\text{Fixed cost} - \text{Loss}}{\text{PV ratio}} \times 100 = \frac{90{,}000 - 30{,}000}{50\%} \times 100$$

= ***₹1,20,000***

***(ii) Calculation of margin of safety for profit of ₹90,000:***

$$\text{Margin of Safety} = \frac{\text{Profit}}{\text{PV ratio}} \times 100 = \frac{90{,}000}{50\%} \times 100$$

= ***₹1,80,000***

***WN:***

***(a) Contribution*** = Fixed Cost + Profit
= ₹90,000 + ₹60,000 = ***₹1,50,000***

***(b) P/V Ratio***

$$= \frac{\text{Contribution}}{\text{Sales Value}} \times 100 = \frac{1{,}50{,}000}{3{,}00{,}000} \times 100 = 50\%$$

***PYQ 2***

PQ Ltd. reports the following cost structure at two capacity levels:

| | ***(100% capacity) 2,000 units*** | ***(75% capacity) 1,500 units*** |
|---|---|---|
| Production overhead I | ₹3 per unit | ₹4 per unit |
| Production overhead II | ₹2 per unit | ₹2 per unit |

If the selling price, reduced by direct material and labour is ₹8 per unit, what would be its break-even point?

***[(3 Marks) Nov 2008]***

***Answer***

$$\textit{BEP (in units)} = \frac{\text{Fixed cost}}{\text{Contribution per unit}} = \frac{6{,}000}{6} = \textit{1,000 units}$$

***WN:***

***(i) Production overhead I:***

In case of 2,000 units = 2000 × 3 = ₹6,000

In case of 1,500 units = 1500 × 4 = ₹6,000

***Hence, production overhead I is fixed i.e. ₹6,000.***

***(ii) Production overhead II:***

At both levels = ₹2 per unit

***Hence, production overhead II is variable production overhead i.e. ₹2 per unit.***

***(iii) Contribution:*** = Selling price reduced by material & labour - Variable production overhead
= ₹8 - ₹2 = ***₹6***

### PYQ 3

ABC Ltd. can produce 4,00,000 units of a product per annum at 100% capacity. The variable production cost are ₹40 per unit and the variable selling expenses are ₹12 per sold unit. The budgeted fixed production expenses were ₹24,00,000 per annum and the fixed selling expenses were ₹16,00,000. During the year ended 31st March, 2008, the company worked at 80% of its capacity. The operating data for the year are as follows:

| | |
|---|---|
| Production | 3,20,000 units |
| Sales @ ₹80 per unit | 3,10,000 units |
| Opening stock of finished goods | 40,000 units |

Fixed production expenses are absorbed on the basis of capacity and fixed selling expenses are recovered on the basis of period.

***You are required to prepare statement of cost and profit for the year ended 31st March, 2008:***

*(1)* On the basis of marginal costing,
*(2)* On the basis of absorption costing.

***[(8 Marks) Nov 2008]***

### Answer

***(1) Income Statement (Under Marginal Costing)***

| Particulars | | ₹ |
|---|---|---|
| Sales (3,10,000 units @ ₹80) | | 2,48,00,000 |
| Variable production cost (3,20,000 units @ ₹40) | | 1,28,00,000 |
| ***Add:*** Opening Stock (40,000 units @ ₹40) | | 16,00,000 |
| ***Less:*** Closing stock $\frac{1,28,00,000}{3,20,000} \times 50,000$ units | | (20,00,000) |
| ***Variable cost of goods sold*** | | ***1,24,00,000*** |
| Variable selling cost (3,10,000 units @ ₹12) | | 37,20,000 |
| ***Variable Cost of Sales*** | | ***1,61,20,000*** |
| ***Contribution (Sales - Variable Cost of Sales)*** | | ***86,80,000*** |
| ***Less:*** Fixed cost: | | |
| Production | 24,00,000 | |
| Selling | 16,00,000 | (40,00,000) |
| ***Profit (Contribution – Fixed Cost)*** | | ***46,80,000*** |

***(2) Income Statement (Under Absorption Costing)***

| Particulars | ₹ |
|---|---|
| Sales (3,10,000 units @ ₹80) | 2,48,00,000 |
| Production costs: | |
| Variable (3,20,000 units @ ₹40) | 1,28,00,000 |
| Fixed (3,20,000 units @ ₹6 | 19,20,000 |
| ***Cost of Goods Produced*** | ***1,47,20,000*** |
| ***Add:*** Opening stock (40,000 Units @ ₹46*) | 18,40,000 |
| ***Less:*** Closing stock $\frac{1,47,20,000}{3,20,000} \times 50,000$ units | (23,00,000) |
| ***Cost of Goods Sold*** | ***1,42,60,000*** |
| Selling expenses: | |
| Variable (3,10,000 units @ ₹12) | 37,20,000 |
| Fixed | 16,00,000 |
| ***Total cost*** | ***1,95,80,000*** |
| ***Unadjusted Profit (Sales – Total Cost)*** | ***52,20,000*** |
| Less: Under recovery of fixed overheads (24,00,000 – 19,20,000) | (4,80,0000) |
| ***Profit under absorption costing*** | ***47,40,000*** |

***Working Notes:***

Fixed production overhead recovery rate = Fixed production overheads ÷ Capacity
= 24,00,000 ÷ 4,00,000 units = ₹6 per unit

## PYQ 4

Product Z has a profit-volume ratio of 28%. Fixed operating costs directly attributable to product Z during the quarter II of the financial year 2009-10 will be ₹2,80,000.

***Calculate the sales revenue required to achieve a quarterly profit of ₹70,000.***

**[(3 Marks) May 2009]**

### Answer

***Sales revenue required*** $= \dfrac{\text{Fixed cost} + \text{Desired profit}}{\text{PV ratio}} = \dfrac{2{,}80{,}000 + 70{,}000}{28\%}$

$= \dfrac{3{,}50{,}000}{28\%} =$ ***₹12,50,000***

***WN:***

| | | |
|---|---|---|
| P/V ratio | = | 28% |
| Quarterly fixed Cost | = | ₹2,80,000 |
| Desired Profit | = | ₹70,000 |

## PYQ 5

A Company sells two products, J and K. The sales mix is 4 units of J and 3 units of K. The contribution margins per unit is ₹40 for J and ₹20 for K. Fixed costs are ₹6,16,000 per month.

***Compute the break-even point.***

**[(2 Marks) Nov 2009]**

### Answer

***BEP in units*** $= \dfrac{\text{Fixed cost}}{\text{Composite contribution per unit}} = \dfrac{6{,}16{,}000}{31.429}$

= ***19,600 units (11,200 units of J and 8,400 units of K)***

***WN:***

***Composite contribution per unit*** = [(40 × 4 units of J) + (20 × 3 units of K)] ÷ 7 units

= ***31.429***

## PYQ 6

Following information are available for the year 2008 and 2009 of PIX Limited:

| Year | 2008 | 2009 |
|---|---|---|
| Sales | ₹32,00,000 | ₹57,00,000 |
| Profit/(Loss) | (₹3,00,000) | ₹7,00,000 |

***Calculate:***

***(a)*** P/V ratio,

***(b)*** Total fixed cost, and

***(c)*** Sales required to earn a profit of ₹12,00,000.

**[(8 Marks) May 2010]**

### Answer

***(a) P/V Ratio*** $= \dfrac{\text{Change in profit}}{\text{Change in sales}} \times 100 = \dfrac{7{,}00{,}000 - (3{,}00{,}000)}{57{,}00{,}000 - 32{,}00{,}000} \times 100 =$ ***40%***

***(b) Fixed cost*** = contribution – profit (by using data of 2009)

= (57,00,000 × 40%) – 7,00,000

= ***₹15,80,000***

***(c) Desired Sales*** $= \dfrac{\text{Fixed cost} + \text{Desired profit}}{\text{PV ratio}} = \dfrac{15{,}80{,}000 + 12{,}00{,}000}{40\%} =$ ***₹69,50,000***

### *PYQ 7*

MNP Ltd. sold 2,75,000 units of its product at ₹37.50 per unit. Variable costs are ₹17.50 per unit (manufacturing costs of ₹14 and selling cost of ₹3.50 per unit). Fixed costs are incurred uniformly throughout the year and amount to ₹35,00,000 (including depreciation of ₹15,00,000). There are no beginning or ending inventories.

***Required:***

*(i)* Estimate breakeven sales level quantity and cash breakeven sales level quantity.
*(ii)* Estimate the P/V ratio.
*(iii)* Estimate the number of units that must be sold to earn an income (EBIT) of ₹2,50,000.
*(iv)* Estimate the sales level to achieve an after-tax income (PAT) of ₹2,50,000. Assume 40% corporate Income Tax rate.

***[(8 Marks) Nov 2010]***

### *Answer*

***(a) Break even sales***

$$= \frac{\text{Fixed cost}}{\text{Contribution per unit}} = \frac{35{,}00{,}000}{37.50 - 17.50}$$

$$= \textbf{1,75,000 units.}$$

***Cash BEP (in Quantity)***

$$= \frac{\text{Fixed cost (excluding depreciation)}}{\text{Contribution per unit}}$$

$$= \frac{35{,}00{,}000 - 15{,}00{,}000}{37.50 - 17.50} = \textbf{1,00,000 units.}$$

***(b) P/V ratio***

$$= \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{37.50 - 17.50}{37.50} \times 100$$

$$= \textbf{53.33\%}$$

***(c) No. of units must be sold***

$$= \frac{\text{Fixed cost} + \text{Desired EBIT}}{\text{Contribution per unit}}$$

$$= \frac{35{,}00{,}000 + 2{,}50{,}000}{20.00} = \textbf{1,87,500 units.}$$

***(d) Desired Sales level (₹)***

$$= \frac{\text{Fixed cost} + \text{Desired Profit Before Tax}}{\text{PV ratio}}$$

$$= \frac{35{,}00{,}000 + 4{,}16{,}667}{53.33\%} = \textbf{₹73,43,750}$$

***WN:***

Desired PAT = ₹2,50,000

Tax rate = 40%

Desired Profit before tax
$$= \frac{\text{Desired PAT}}{(1 - t)} = \frac{2{,}50{,}000}{(1 - 0.40)} = \textbf{₹4,16,667}$$

### *PYQ 8*

The P/V Ratio of Delhi Ltd. is 50% and margin of safety is 40%. The company sold 500 units for ₹5,00,000.

***You are required to calculate:***

*(i)* Break even point, and
*(ii)* Sales in units to earn a profit of 10% on sales.

***[(5 Marks) Nov 2011]***

### *Answer*

***(i) BEP*** = 60% of sales [sales – MOS (40% of sales)]

= 60% of ₹5,00,000 = ***₹3,00,000***

***(ii) Sales in units*** $= \dfrac{\text{Fixed cost} + \text{Desired profit}}{\text{Contribution per unit}} = \dfrac{1{,}50{,}000 + 100 \text{ per unit}}{500}$

$= \dfrac{1{,}50{,}000}{400 \text{ per unit for fixed cost}} =$ ***375 units***

***WN:***

***(a) Fixed cost*** = PV Ratio × BEP sales
= 50% × ₹3,00,000 = ***₹1,50,000***

***(b) Contribution per unit*** = PV Ratio × sale price per unit
= 50% × ₹1,000 (₹5,00,000 ÷ 500 units) = ***₹500***

***(c) Desired profit per unit*** = 10% of sales price per unit
= 10% of ₹1,000 = ***₹100***

***PYQ 9***

The following are related to LM Limited for the year ending 31st March, 2012: Sales 24,000 units @ ₹200 per unit, PV Ratio 25%, and Break- Even Point 50% of sales.

***You are required to calculate:***

***(i)*** Fixed cost for the year.
***(ii)*** Profit earned for the year.
***(iii)*** Units to be sold to earn a target net profit of ₹11,00,000 for a year.
***(iv)*** Number of units to be sold to earn a net income of 25% on cost.
***(v)*** Selling price per unit if Break- even Point is to be brought down by 4,000 units.

***[(8 Marks) Nov 2012]***

***Answer***

***(i) Fixed Cost*** = Contribution at BEP sales
= 25% of ₹24,00,000 = ***₹6,00,000***

***WN:***

***BEP Sales*** = 50% of sales
= 50% of (24,000 × ₹200)
= 50% of ₹48,00,000 = ***₹24,00,000***

***(ii) Profit earned for the Year*** = Contribution – Fixed cost
= 25% of ₹48,00,000 – ₹6,00,000
= ₹12,00,000 – ₹6,00,000 = ***₹6,00,000***

***(iii) Units to be sold to earn a target profit of ₹11,00,000:***

$= \dfrac{\text{Fixed cost} + \text{Target profit}}{\text{Cont}^{n} \text{ per unit}} = \dfrac{6{,}00{,}000 + 11{,}00{,}000}{25\% \times 200}$

= ***34,000 units***

***(iv) No. of units to be sold to earn a net income of 25% of cost (20% of sales):***

$= \dfrac{\text{Fixed cost} + \text{Desired profit}}{\text{Contribution per unit}} = \dfrac{6{,}00{,}000 + 20\% \text{ of sales}}{25\% \text{ of } 200}$

$= \dfrac{6{,}00{,}000 + 20\% \text{ of } 200 \text{ per unit}}{50} = \dfrac{6{,}00{,}000}{50 - 40} =$ ***60,000 units***

***(v) Selling price per unit if revised BEP is reduced by 4,000 units:***

Existing BEP = 50% of 24,000 units = 12,000 units

Hence, Revised BEP = 12,000 - 4,000 = 8,000 units

| | | |
|---|---|---|
| At BEP, Sales Value | = | Variable Cost + Fixed Cost |
| | = | 8,000 units × ₹150 (75% of ₹200) + ₹6,00,000 |
| | = | ₹12,00,000 + ₹6,00,000 |
| At BEP, Sales Value | = | ₹18,00,000 |
| Sales value for 8,000 units | = | ₹18,00,000 |
| Sales price per unit | = | ₹18,00,000 ÷ 8,000 units = ***₹225*** |

### PYQ 10

MFN Limited started is operation in 2011 with the total production capacity of 2,00,000 units. The following data for two years is made available to you:

| | **2011** | **2012** |
|---|---|---|
| Sales units | 80,000 | 1,20,000 |
| Total cost (₹) | 34,40,000 | 45,60,000 |

There has been no change in the cost structure and selling price and it is expected to continue in 2013 as well. Selling price is ₹40 per unit.

***You are required to calculate:***

***(i)*** Break-Even Point (in units).

***(ii)*** Profit at 75% of the total capacity in 2013.

***[(5 Marks) May 2013]***

### Answer

***(i) Break Even Point (in units)*** $= \frac{\text{Fixed Cost}}{\text{Cont}^n \text{ P.U.}} = \frac{12,00,000}{12}$ = ***1,00,000 units***

***(ii) Profit at 75% of total capacity:***

***Profit*** = (No. of units sold × Cont$^n$ per unit) – Fixed cost

= (2,00,000 × 75% × ₹12) - 12,00,000 = ***₹6,00,000***

***Working Note:***

***(a) Contribution per unit*** = Selling price per unit – Value cost per unit

= ₹40 – ₹28 = ***₹12***

***(b) Variable cost per unit*** $= \frac{\text{Increase in Cost}}{\text{Increase in units}} = \frac{45,60,000 - 34,40,000}{1,20,000 - 80,000}$

= ***₹28 per unit***

***(c) Fixed cost*** = Total cost – Variable cost

= 34,40,000 – (80,000 × 28) (by using data of 2011)

= ***12,00,000***

### PYQ 11

SHA Limited provides the following trading results:

| ***Year*** | ***Sales*** | ***Profit*** |
|---|---|---|
| 2012-13 | ₹25,00,000 | 10% of Sale |
| 2013-14 | ₹20,00,000 | 8% of Sale |

***You are required to calculate:***

***(i)*** Fixed Cost

***(ii)*** Break Even Point

***(iii)*** Amount of profit, if sale is ₹30,00,000

***(iv)*** Sale, when desired profit is ₹4,75,000

***(v)*** Margin of Safety at a profit of ₹2,70,000

***[(5 Marks) May 2014]***

***Answer***

***(i) Calculation of Fixed Cost (by using data of year 2012-13):***

***Fixed cost*** = Contribution – profit = (Sales × PV Ratio) - 10% of Sale

= (₹25,00,000 × 18%) - 10% of ₹25,00,000 = ***₹2,00,000***

***(ii) Calculation of Break Even Point:***

$$\textbf{BEP} = \frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{2,00,000}{18\%} = ₹11,11,111.11$$

***(iii) Calculation of Amount of profit, if Sale is ₹30,00,000:***

***Profit*** = Contribution - Fixed Cost

= ₹30,00,000 × 18% - 2,00,000 = ***₹3,40,000***

***(iv) Sales, when desired profit is ₹4,75,000:***

$$\textbf{Sales} = \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV Ratio}} = \frac{2,00,000 + 4,75,000}{18\%}$$

= ***₹37,50,000***

***(v) Margin of Safety at a profit of ₹2,70,000:***

$$\textbf{MOS} = \frac{\text{Profit}}{\text{PV Ratio}} = \frac{2,70,000}{18\%} = ₹15,00,000$$

***Working Note:***

***(i) PV Ratio***

$$= \frac{\text{Difference in Profit}}{\text{Difference in Sales}} \times 100$$

$$= \frac{10\% \text{ of } 25,00,000 - 8\% \text{ of } 20,00,000}{25,00,000 - 20,00,000} \times 100 = \frac{90,000}{5,00,000} \times 100$$

= ***18%***

***PYQ 12***

ABC Limited started is operation in the year 2013 with the total production capacity of 2,00,000 units. The following information, for two years, are made available to you:

| | 2013 | 2014 |
|---|---|---|
| Sales units | 80,000 | 1,20,000 |
| Total cost (₹) | 34,40,000 | 45,60,000 |

There has been no change in the cost structure and selling price and it is anticipated that it will remain unchanged in 2015 also. Selling price is ₹40 per unit.

***Calculate:***

***(a)*** Variable cost per unit.

***(b)*** Profit Volume ratio.

***(c)*** Break-Even Point (in units).

***(d)*** Profit if the firm operates at 75% of the capacity.

***[(5 Marks) May 2015]***

***Answer***

***(a) Variable cost per unit***

$$= \frac{\text{Increase in Cost}}{\text{Increase in Units}} = \frac{45,60,000 - 34,40,000}{1,20,000 - 80,000}$$

= ***₹28 per unit***

***(b) Profit Volume ratio***

$$= \frac{\text{Contribution per unit}}{\text{Sale price per unit}} \times 100 = \frac{40 - 28}{40} \times 100$$

= ***30%***

***(c) Break Even Point (in units)*** = $\frac{\text{Fixed Cost}}{\text{Cont}^{n}\text{ P.U.}}$ = $\frac{12,00,000}{12}$ = ***1,00,000 units***

***(d) Profit at 75% of total capacity:***

***Profit*** = (No. of units sold × $\text{Cont}^n$ per unit) – Fixed cost
= (2,00,000 × 75% × ₹12) - 12,00,000 = ***₹6,00,000***

***Working Note:***

***Fixed Cost*** = Total cost – Variable cost (by using data of 2013)
= 34,40,000 – (80,000 × 28) = ***12,00,000***

***PYQ 13***

SL Limited is engaged in manufacture of tyres. Analysis of income statement indicated a profit of ₹150 Lakhs on a sales volume of 50,000 units. The fixed costs are ₹850 Lakhs which appears to be high. Existing selling price is ₹3,400 per unit. The company is considering to revise the target profit to ₹350 Lakhs.

***You are required to compute:***

***(i)*** Break even point at existing levels in units and in rupees.
***(ii)*** The number of units required to be sold to earn the target profit.
***(iii)*** Profit with 15% increase in selling price and drop in sales volume by 10%
***(iv)*** Volume to be achieved to earn target profit at revised selling price as calculated in ***(iii)*** above, if reduction of 8% in the variable costs and ₹85 Lakhs in the fixed cost is envisaged.

***[(8 Marks) June 2015]***

***Answer***

***(i) Break even point (in units)*** = $\frac{\text{Fixed Cost}}{\text{Contribution Per Unit}}$ = $\frac{850\text{ Lakhs}}{2,000}$ = ***42,500 Units***

***Break even point (in rupees)*** = BEP in Units × Sales Price Per Unit
= 42,500 × ₹3,400 = ***₹1,445 Lakhs***

***(ii) Sales to earn target profit*** = $\frac{\text{Fixed Cost} + \text{Target Profit}}{\text{Contribution Per Unit}}$ = $\frac{850\text{ Lakhs} + 350\text{ Lakhs}}{2,000}$
= ***60,000 Units***

***(iii) Revised Profit*** = Revised Contribution – Fixed Cost
= [₹2,510 × 45,000 units (50,000 – 10%)] - 850 Lakhs
= ***₹279.5 Lakhs***

***(iv) Volume to earn target profit*** = $\frac{\text{Revised Fixed Cost} + \text{Target Profit}}{\text{Revised Contribution Per Unit}}$
= $\frac{765\text{ Lakhs} + 350\text{ Lakhs}}{2,622}$ = ***42,524.79 Units***

***Working Note:***

***(a) Calculation of Contribution per unit and PV Ratio:***

Contribution = Fixed Cost + Profit
= 850 Lakhs + 150 Lakhs = 1,000 Lakhs

Contribution Per Unit = Total Contribution ÷ No of units
= 1,000 Lakhs ÷ 50,000 units = ₹2,000 per unit

***(b) Calculation of Revised Contribution with 15% increase in sale price:***

Revised Contribution = Revised Sale Price – Variable Cost
= (3,400 + 15%) – 1,400 = ₹2,510 per unit

**(c) Calculation of Revised Variable Cost per unit, Revised Contribution per unit and Fixed Cost:**

| | | | | |
|---|---|---|---|---|
| Revised Variable Cost | = | Variable Cost – 8% | | |
| | = | 1,400 – 8% | = | ₹1,288 per unit |
| Revised Contribution per unit | = | (3,400 + 15%) – 1,288 | = | ₹2,622 per unit |
| Revised Fixed Cost | = | 850 Lakhs – 85 Lakhs | = | ₹765 Lakhs |

## PYQ 14

A company gives the following information:

| | | |
|---|---|---|
| Margin of safety | : | ₹3,75,000 |
| Total cost | : | ₹3,87,500 |
| Margin of safety in units | : | 15,000 units |
| Break even sales in units | : | 5,000 units |

***You are required to calculate:***

***(i)*** Selling price per unit, ***(ii)*** Profit, ***(iii)*** Profit/Volume ratio, ***(iv)*** Break even sales (in ₹), ***(v)*** Fixed cost

***[(5 Marks) Nov 2015]***

### Answer

***(i) Selling price per unit*** $= \dfrac{\text{Margin of safety in rupees}}{\text{Margin of safety in units}} = \dfrac{3{,}75{,}000}{15{,}000}$

$=$ ***₹25***

***(ii) Profit*** = Total sales – Total cost

= [(15,000 + 5,000) × 25] – 3,87,500 = ***₹1,12,500***

***(iii) Profit/Volume ratio*** $= \dfrac{\text{Profit}}{\text{Margin of safety in rupees}} \times 100 = \dfrac{1{,}12{,}500}{3{,}75{,}000} \times 100$

= ***30%***

***(iv) Break even sales in rupees*** = Break even point in units × sale price per unit

= 5,000 units × 25 = ***₹1,25,000***

***(v) Fixed cost*** = Break even point in rupees × PV ratio

= 1,25,000 × 30% = ***₹37,500***

## PYQ 15

A dairy product company manufacturing baby food with a shelf life of one year furnishes the following information:

***(i)*** On 1st January, 2016, the company has an opening stock of 20,000 packets whose variable cost is ₹180 per packet.

***(ii)*** In 2015, production was 1,20,000 packets and the expected production in 2016 is 1,50,000 packets. Expected sales for 2016 is 1,60,000 packets.

***(iii)*** In 2015, fixed cost per unit was ₹60 and it is expected to increase by 10% in 2016. The variable cost is expected to increase by 25%. Selling price for 2016 has been fixed at ₹300 per packet.

***You are required to calculate the Break-even volume in units for 2016.***

***[(5 Marks) May 2016]***

### Answer

***Break-even-point (in units)*** $= \text{Opening units} + \dfrac{\text{Fixed cost} - \text{Contribution from opening units}}{\text{Contribution per current period unit}}$

$= 20{,}000 \text{ units} + \dfrac{79{,}20{,}000 - 120 \times 20{,}000}{300 - 225}$ = ***93,600 Units***

***Note: Since, shelf life of the product is one year only, hence, opening stock is to be sold first.***

***Working notes:***

| | | | | |
|---|---|---|---|---|
| ***Fixed cost (2015)*** | = | 1,20,000 packets × ₹60 per unit | = | ***₹72,00,000*** |
| ***Fixed cost (2016)*** | = | ₹72,00,000 + 10% | = | ***₹79,20,000*** |
| ***Variable cost (2016)*** | = | ₹180 + 25% | = | ***₹225 per unit*** |
| ***Contribution (2015)*** | = | ₹300 - ₹180 | = | ***₹120 per unit*** |

### *PYQ 16*

The M-Tech Manufacturing Company is presently evaluating two possible processes for the manufacture of a toy. The following information is available:

| *Particulars* | *Process A (₹)* | *Process B (₹)* |
|---|---|---|
| Variable cost per unit | 12 | 14 |
| Sales price per unit | 20 | 20 |
| Total fixed cost per year | 30,00,000 | 21,00,000 |
| Capacity (in units) | 4,30,000 | 5,00,000 |
| Anticipated sales (next year, in units) | 4,00,000 | 4,00,000 |

***Suggest:***

1. Which process should be chosen?
2. Would you change your answer as given above, if you were informed that the capacities of the two processes are as follows: A - 6,00,000 units; B - 5,00,000 units? Why?

***[(4 Marks) May 2016]***

### *Answer*

**1.** ***Profit (Process A)*** = Contribution – Fixed cost
= 4,00,000 units × ₹8 (₹20 - ₹12) – ₹30,00,000 = ***₹2,00,000***

***Profit (Process B)*** = Contribution – Fixed cost
= 4,00,000 units × ₹6 (₹20 - ₹14) – ₹21,00,000 = ***₹3,00,000***

***Suggestion:*** Process B should be chosen as it gives more profit.

**2.** ***Profit (Process A)*** = Contribution – Fixed cost
= 6,00,000 units × ₹8 (₹20 - ₹12) – ₹30,00,000 = ***₹18,00,000***

***Profit (Process B)*** = Contribution – Fixed cost
= 5,00,000 units × ₹6 (₹20 - ₹14) – ₹21,00,000 = ***₹9,00,000***

***Suggestion:*** Process A should be chosen as it will give more profit.

***Note:*** It is assumed that capacity produced equals sales.

### *PYQ 17*

The following figures are available from the records of ABC Company as at 31st March:

| | *2015 (₹in Lakhs)* | *2016 (₹in Lakhs)* |
|---|---|---|
| Sales | 200 | 250 |
| Profit | 30 | 45 |

***Calculate:***

1. The P/V ratio and total fixed expenses.
2. The break-even level of sales.
3. Sales required to earn a profit of ₹70 lakhs.

***[(5 Marks) Nov 2016]***

### *Answer*

**1. Profit Volume ratio** $= \frac{\text{Increase in Profit}}{\text{Increase in Sales}} \times 100 = \frac{45-30}{250-200} \times 100 =$ ***30%***

**Fixed Cost** = Contribution – Profit (by using data of 2015)
= 200 Lakhs × 30% – 30 Lakhs = ***₹30,00,000***

**2. Break Even Point** $= \frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{30,00,000}{30\%}$
= ***₹1,00,00,000***

**3. Required Sales** $= \frac{\text{Fixed Cost} + \text{Profit}}{\text{PV Ratio}} = \frac{30\text{ Lakhs} + 70\text{ Lakhs}}{30\%}$
= ***₹3,33,33,333***

## PYQ 18

A company has introduced a new product and marketed 20,000 units. Variable cost of the product is ₹20 per units and fixed overheads are ₹3,20,000.

***You are required to:***

1. Calculate selling price per unit to earn a profit of 10% on sales value, BEP and Margin of Safely?
2. If the selling price is reduced by the company by 10%, demand is expected to increase by 5,000 units, then what will be its impact on Profit, BEP and Margin of Safety?
3. Calculate Margin of Safety if profit is ₹64,000.

***[(8 Marks) Nov 2016]***

## Answer

**1. *Sales:***

Let Sale price per unit be 'x'

Sale price × no of units = Variable cost per unit × no of units + Fixed cost + Profit
20,000 x = 20 × 20,000 + 3,20,000 + 10% of 20,000 x
20,000 x = 4,00,000 + 3,20,000 + 2,000 x
x = 7,20,000 ÷ 18,000 = ***₹40 per unit***

***Break-even-point*** = Fixed cost ÷ Contribution per unit
= 3,20,000 ÷ 20 = ***16,000 units***

***Margin of safety*** = Total sales unit – BEP units
= 20,000 units – 16,000 units = ***4,000 units***

**2. *Impact on Profit, BEP and MOS:***

***Impact on profit:***

Existing profit = Sales – Variable cost – Fixed cost
= 20,000 units × 40 – 20,000 units × 20 – 3,20,000
= 80,000

Revised profit = Sales – Variable cost – Fixed cost
= 25,000 units × 36 (40 – 10%) – 25,000 units × 20 – 3,20,000
= 80,000

Though there is no impact on the total profit amount but the rate of profit is decreased from 10% to 8.89% (80,000/9,00,000 × 100).

***Impact on BEP:***

Revised BEP = Fixed cost ÷ Contribution per unit
= 3,20,000 ÷ 16 (36 - 20) = ***20,000 units***

The Break-even point is increased by 4,000 units (20,000 units – 16,000 units).

***Impact on MOS:***

Revised MOS = Total sales unit – BEP units
= 25,000 units – 20,000 units = **5,000 units**

Margin of safety is increased by 1,000 units (5,000 units – 4,000 units).

**3. Margin of Safety when, profit ₹64,000:**

**Margin of safety** = Profit ÷ Contribution per unit
= 64,000 ÷ 20 = **3,200 units**

## PYQ 19

The following information was obtained from the records of a manufacturing unit:

| Particulars | (₹) | (₹) |
|---|---|---|
| Sales 80,000 units @ ₹25 per unit | | 20,00,000 |
| Materials consumed | 8,00,000 | |
| Variable overheads | 2,00,000 | |
| Labour charges | 4,00,000 | |
| Fixed overheads | 3,60,000 | 17,60,000 |
| Net profit | | 2,40,000 |

**Calculate:**

1. The number of units by selling which the company will neither lose nor gain anything.
2. The sales needed to earn a profit of 20% on sales.
3. The extra units which should be sold to obtain the present profit if it is proposed to reduce the selling price by 20% and 25%.
4. The selling price to be fixed to bring down its Break-even Point to 10,000 units under present conditions.

**[(8 Marks) May 2017]**

## Answer

**1. Break-even-point (in units)** = Fixed cost ÷ Contribution per unit
= 3,60,000 ÷ 7.50 = **48,000 units**

**2. Required sales (in units)** = $\frac{\text{Fixed cost}}{\text{Contribution per unit} - \text{Profit per unit}}$

= $\frac{3,60,000}{7.50 - 20\% \text{ of } 25.00}$ = **1,44,000 units/ ₹36,00,000**

**3. Calculation of Extra units to be sold:**

No. of units sold with 20% decrease in sales price

= $\frac{\text{Fixed cost} + \text{Profit}}{\text{Revised contribution per unit}}$ = $\frac{3,60,000 + 2,40,000}{2.50}$

= 2,40,000 units

**Extra units to be sold** = 2,40,000 – 80,000 = **1,60,000 units**

No. of units sold with 20% decrease in sales price

= $\frac{\text{Fixed cost} + \text{Profit}}{\text{Revised contribution per unit}}$ = $\frac{3,60,000 + 2,40,000}{1.25}$

= 4,80,000 units

**Extra units to be sold** = 4,80,000 – 80,000 = **4,00,000 units**

**4. Selling price per unit to bring down its BEP to 10,000 units:**

At BEP, Sales Value = Variable Cost + Fixed Cost
= 10,000 units × ₹17.50 + ₹3,60,000 = ₹5,35,000

Sales value for 10,000 units = ₹5,35,000

Sales price per unit = ₹5,35,000 ÷ 10,000 units = **₹53.50**

### PYQ 20

A company, with 90% Capacity utilization, is manufacturing a product and makes a sale of ₹9,45,000 at ₹30 per unit. The cost data is as under:

| | |
|---|---|
| Materials | ₹9 per unit |
| Labour | ₹7 per unit |
| Semi variable cost (including variable cost ₹4.25 per unit) | ₹2,10,000 |

Fixed cost is ₹94,500 upto 90% level of output (capacity). Beyond this, an additional amount of ₹15,000 will be incurred.

***You are required to calculate:***

*(1)* Level of output at break-even point,

*(2)* Number of units to be sold to earn a net income of 10% of sales and

*(3)* Level of output needed to earn a profit of ₹1,41,375.

***[(8 Marks) Nov 2017]***

### Answer

***(1) Break-even-point (in units)*** = Fixed cost ÷ Contribution per unit
= ₹1,70,625 ÷ ₹9.75 = ***17,500 units***

***Break-even-point (in ₹)*** = 17,500 units × ₹30 = ***₹5,25,000***

***(2) Required sales (in units)*** = $\frac{\text{Fixed cost}}{\text{Contribution per unit} - \text{Profit per unit}}$

= $\frac{1{,}70{,}625}{9.75 - 10\% \text{ of } 30}$ = ***25,277.78 units***

***(3) Required sales (in units)*** = $\frac{\text{Fixed cost} + \text{Profit}}{\text{Contribution per unit}}$

= $\frac{1{,}70{,}625 + 1{,}41{,}375}{9.75}$ = 32,000 units

***Note:*** 32,000 units is higher than 90% activity level (31,500 units), therefore now fixed cost will be ₹1,85,625 (₹1,70,625 + ₹15,000)

***Required sales (in units)*** = $\frac{\text{Fixed cost} + \text{Profit}}{\text{Contribution per unit}}$ = $\frac{1{,}85{,}625 + 1{,}41{,}375}{9.75}$

= ***33,538.46 units or ₹10,06,154***

***Working notes:***

Existing level of sales (90% capacity level) = ₹9,45,000 ÷ ₹30 = 31,500 units

Fixed cost in semi variable cost = Total semi variable cost – variable cost
= ₹2,10,000 – 31,500 × ₹4.25 = ₹76,125

Fixed cost = ₹94,500 + ₹76,125 = ₹1,70,625

Contribution per unit = ₹30 - ₹9 - ₹7 - ₹4.25 = ₹9.75

### PYQ 21

A company is producing an identical product in two factories. The following are the details in respect of both factories:

| *Particulars* | *Factory X* | *Factory Y* |
|---|---|---|
| Sales price per unit (₹) | 50 | 50 |
| Variable cost per unit (₹) | 40 | 35 |

| | | |
|---|---|---|
| Fixed cost (₹) | 2,00,000 | 3,00,000 |
| Depreciation included in above fixed cost (₹) | 40,000 | 30,000 |
| Sales in units | 30,000 | 20,000 |
| Production capacity (units) | 40,000 | 30,000 |

***You are required to determine:***

*(1)* Break even point (BEP) each factory individually.
*(2)* Cash break even point for each factory individually.
*(3)* BEP for company as a whole, assuming the present product mix is in sales ratio.
*(4)* Consequence on profit and BEP if product mix is changed to 2 : 3 and total demand remain same.

***[(8 Marks) May 2018]***

## *Answer*

***(1) Individual BEP:***

Factory X = Fixed cost ÷ Contribution per unit
= 2,00,000 ÷ 10 (50 - 40) = ***20,000 units***

Factory Y = 3,00,000 ÷ 15 (50 - 35) = ***20,000 units***

***(2) Individual Cash BEP:***

Factory X = Cash fixed cost ÷ Contribution per unit
= 1,60,000 ÷ 10 (50 - 40) = ***16,000 units***

Factory Y = 2,70,000 ÷ 15 (50 - 35) = ***18,000 units***

***(3) BEP as a whole:*** = Total fixed cost ÷ Composite contribution per unit
= (2,00,000 + 3,00,000) ÷ 12 (10 × $^3/_5$ + 15 × $^2/_5$)
= ***41,667 units***

***(4) BEP as a whole:***

Total demand original = 30,000 of X + 20,000 of Y = 50,000 units

Revised sales X = 50,000 × $^2/_5$ = 20,000 units

Revised sales Y = 50,000 × $^3/_5$ = 30,000 units

Existing Profit = Contribution – Fixed cost
= (30,000 × 10 + 20,000 × 15) – (2,00,000 + 3,00,000)
= ₹1,00,000

Revised Profit = (20,000 × 10 + 30,000 × 15) – (2,00,000 + 3,00,000)
= ₹1,50,000

Consequence on Profit = ***Increase in Profit by ₹50,000***

Revised BEP = Total fixed cost ÷ Revised composite contribution per unit
= (2,00,000 + 3,00,000) ÷ 13 (10 × $^2/_5$ + 15 × $^3/_5$)
= 38,462 units

Consequence on BEP = ***Decrease in BEP by 3,205 units***

## *PYQ 22*

Following figures have been extracted from the books of M/s. RST Private Limited:

| *Year* | *Sales* | *Profit* |
|---|---|---|
| 2016-17 | ₹4,00,000 | 15,000 (loss) |
| 2017-18 | ₹5,00,000 | 15,000 (profit) |

***You are required to calculate:***

*(1)* Profit Volume Ratio

**(2)** Fixed Costs
**(3)** Break Even Point
**(4)** Sales required to earn a profit of ₹45,000
**(5)** Margin of Safety in financial year 2017-2018. ***[(5 Marks) May 2018]***

### Answer

***(a) PV Ratio*** $= \dfrac{\text{Difference in Profit}}{\text{Difference in Sales}} \times 100 = \dfrac{30{,}000}{1{,}00{,}000} =$ ***30%***

***(b) Calculation of Fixed Cost (by using data of year 2017-18):***

***Fixed cost*** = Contribution – profit
= 5,00,000 × 30% - 15,000 = ***₹1,35,000***

***(c) Calculation of Break Even Point:***

***BEP*** $= \dfrac{\text{Fixed Cost}}{\text{PV Ratio}} = \dfrac{1{,}35{,}000}{30\%} =$ ***₹4,50,000***

***(d) Sales required to earn ₹45,000:***

***Sales*** $= \dfrac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV Ratio}} = \dfrac{1{,}35{,}000 + 45{,}000}{30\%}$
= ***₹6,00,000***

***(e) Margin of Safety in financial year 2017-2018:***

***MOS*** $= \dfrac{\text{Profit}}{\text{PV Ratio}} = \dfrac{15{,}000}{30\%} =$ ***₹50,000***

### PYQ 23

PH Gems Ltd. is manufacturing readymade suits. It has annual production capacity of 2,000 pieces. The cost accountant has presented following information for the year to the management:

| Particulars | (₹) | (₹) |
|---|---|---|
| Sales 1,500 pieces @ ₹1,800 per piece | | 27,00,000 |
| Direct Materials | 5,94,200 | |
| Direct Labour | 4,42,600 | |
| Overheads (40% Fixed) | 11,97,000 | 22,33,800 |
| Net profit | | 4,66,200 |

***Evaluate the following options:***

1. If the selling price is increased by ₹200, the sales will come down to 60% of the total annual capacity. Should the company increase its selling price?
2. The company can earn a profit of 20% on sales if the company provide TIEPIN with readymade suit. The cost of each TIEPIN is ₹18. Calculate the sales to earn a profit @20% on sales.

***[(10 Marks) May 2018]***

### Answer

***(1) Statement Showing Evaluation of Option 1***

| Particulars | | (₹) | (₹) |
|---|---|---|---|
| Sales 1,200 pieces (2,000 × 60%) @₹2,000 (1,800 + 200) per piece | | | 24,00,000 |
| Less: Variable Cost: | | | |
| Direct Materials | $(5{,}94{,}200 \times {}^{1{,}200}/_{1{,}500})$ | 4,75,360 | |
| Direct Labour | $(4{,}42{,}600 \times {}^{1{,}200}/_{1{,}500})$ | 3,54,080 | |
| Variable Overheads | $(11{,}97{,}000 \times 60\% \times {}^{1{,}200}/_{1{,}500})$ | 5,74,560 | (14,04,000) |
| Contribution | | | 9,96,000 |
| Less: Fixed Overheads | (11,97,000 × 40%) | | (4,78,800) |
| ***Profit*** | | | ***5,17,200*** |

***Yes company should increase its selling price having higher profit.***

***(2) Calculation of sales to earn 20% profit with TIEPIN option:***

***Sales*** $= \frac{\text{Fixed Cost + Profit}}{\text{Revised PV Ratio}} = \frac{4,78,800 + 20\% \text{ Sales}}{34\%}$

= ***₹34,20,000 or 1,900 units***

***Working Note:***

Revised PV Ratio $= \frac{\text{Revised Contribution}}{\text{Sales}} \times 100 = \frac{612}{1,800} \times 100 =$ ***34%***

Revised contribution per unit = Sale price – Variable cost per unit including TIEPIN
= 1,800 – {(5,94,200 + 4,42,600 + 11,97,000 × 60%) ÷ 1,500 units} – 18
= 1,800 – 1,170 – 18 = ***612***

## *PYQ 24*

A manufacturing concern was operating at margin of safety of 40% in the year 2018 and was selling its product at ₹75 per unit. Variable cost ratio was 80% and fixed cost amounted to ₹5,40,000.

In the year 2019, the concern anticipates an increase in the variable costs and fixed cost by 15% and 5% respectively.

***You are required to:***

Find out the selling price to be fixed in the year 2019 keeping in view that concern is willing to maintain same P/V ratio as it was in the year 2018.

***[(5 Marks) Nov 2018]***

## *Answer*

| | | | | |
|---|---|---|---|---|
| Variable cost (2018) | = | ₹75 × 80% | = | ₹60 per unit |
| Variable cost (2019) | = | ₹60 + 15% | = | ₹69 per unit |
| Sale Price to maintain same PV Ratio | = | ₹69 ÷ 80% | = | ***₹86.25 per unit*** |

## *PYQ 25*

A manufacturing company is providing a product 'A' which is sold in the market at ₹45 per unit. The company has the capacity to produce 40,000 units per year. The budget for the year 2018-2019 projects a sale of 30,000 units.

The cost of each unit are expected as under:

| | |
|---|---|
| Materials | ₹12 |
| Wages | ₹9 |
| Overheads | ₹6 |

Margin of safety is ₹4,12,500.

***You are required to:***

***(1)*** Calculate fixed cost and break-even point.
***(2)*** Calculate the volume of sales to earn profit of 20% on sales.
***(3)*** If management is willing to invest 10,00,000 with the expected return of 20%, calculate units to be sold to earn this profit.
***(4)*** Management expects additional sales if the selling price is reduced to ₹44. Calculate units to be sold to achieve the same profit as desired in above ***(3)***.

***[(10 Marks) Nov 2018]***

## *Answer*

***(1)*** Fixed cost = BEP sales × P/V ratio
= ₹9,37,500 × 40% = ***₹3,75,000***

Break-even point = Total sales – Margin of safety
= 30,000 units × ₹45 – ₹4,12,500 = ***₹9,37,500***

P/V ratio = (Contribution ÷ Sales) × 100
= [{45 – (12 + 9 + 6)} ÷ 45] × 100
= (18 ÷ 45) × 100 = ***40%***

***(2)*** Sales to earn 20% on sales = $\frac{\text{Fixed Cost + Profit}}{\text{P/V Ratio}}$ = $\frac{3,75,000 + 20\% \text{ Sales}}{40\%}$
= ***₹18,75,000 or 41,667 units***

***(3)*** Sales in units = $\frac{\text{Fixed Cost + Profit}}{\text{Contribution p.u.}}$ = $\frac{3,75,000 + 20\% \text{ on } 10,00,000}{18}$
= ***31,945 units***

***(4) Calculation of units to be sold to earn same profit as in (3) with revised sale price:***

Revised sales = $\frac{\text{Fixed Cost + Profit}}{\text{Revised Contribution p.u.}}$ = $\frac{3,75,000 + 2,00,000}{17}$
= ***33,824 units***

### *PYQ 26*

M/s Gaurav Private Limited is manufacturing and selling two products 'BLACK' and 'WHITE' at selling price of ₹20 and ₹30 respectively.

***The following sales strategy has been outlined for the financial year 2019-20:***

***(a)*** Sales planned for the year will be ₹81,00,000 in the case of 'BLACK' and ₹54,00,000 in the case of 'WHITE'.
***(b)*** The selling price of 'BLACK' will be reduced by 10% and that of 'WHITE' by 20%.
***(c)*** Break-even is planned at 70% of the total sales of each product.
***(d)*** Profit for the year to be maintained at ₹8,26,200 in the case of 'BLACK' and ₹7,45,200 in the case of 'WHITE'. This would be possible by reducing the present annual fixed cost of ₹42,00,000 allocated as ₹22,00,000 to 'BLACK' and ₹20,00,000 to 'WHITE'.

***You are required to calculate:***

***(1)*** Number of units to be sold of 'BLACK' and 'WHITE' to Break even during the financial year 2019-20.
***(2)*** Amount of reduction in fixed cost product-wise to achieve desired profit mentioned at ***(d)*** above.

***[(5 Marks) May 2019]***

### *Answer*

***(1) Statement Showing Break Even Sales in Units during 2019-20***

| ***Particulars*** | ***Black*** | ***White*** |
|---|---|---|
| Planned sales in ₹ | 81,00,000 | 54,00,000 |
| BEP sales in ₹ (70% of planned sales)<br>÷ Sale price revised (₹20 – 10% and ₹30 – 20%) | 56,70,000<br>÷ 18 | 37,80,000<br>÷ 24 |
| ***BEP sales in units*** | ***3,15,000*** | ***1,57,500*** |

***(2) Statement Showing Reduction in Fixed Cost***

| ***Particulars*** | ***Black*** | ***White*** |
|---|---|---|
| Profit to be maintained<br>Margin of Safety (30% of sales)<br>Profit volume ratio (Profit ÷ MOS) | 8,26,200<br>24,30,000<br>34% | 7,45,200<br>16,20,000<br>46% |
| Present fixed cost<br>Fixed cost revised (BEP × PV ratio) | 22,00,000<br>19,27,800 | 20,00,000<br>17,38,800 |
| ***Reduction in fixed cost*** | ***2,72,200*** | ***2,61,200*** |

### PYQ 27

When volume is 4,000 units, average cost is ₹3.75 per unit. When volume is 5,000 units, average cost is ₹3.50 per unit. The break-even point is 6,000 units.

**Calculate:**

**(1)** Variable Cost per unit

**(2)** Fixed Cost and

**(3)** Profit Volume Ratio.

**[(5 Marks) Nov 2019]**

### Answer

**(1) Variable Cost per unit:**

$$\text{Variable cost per unit} = \frac{\text{Change in Cost}}{\text{Change in Units}} = \frac{5{,}000 \times 3.50 - 4{,}000 \times 3.75}{5{,}000 - 4{,}000}$$

$$= \frac{17{,}500 - 15{,}000}{1{,}000} = \text{₹}2.50 \text{ per unit}$$

**(2) Fixed Cost** = Total Cost – Variable Cost

= 4,000 × ₹3.75 – 4,000 × ₹2.50 (using 4,000 units as base)

= ₹15,000 – ₹10,000 = **₹5,000**

**(3) Profit Volume Ratio**

$$= \frac{\text{Fixed Cost}}{\text{BEP Sales}} \times 100 = \frac{5{,}000}{20{,}000} \times 100$$

= **25%**

**Working Note:**

BEP sales = Fixed Cost + Variable Cost

= 5,000 + 6,000 units × ₹2.50 = **₹20,000**

### PYQ 28

Moon Ltd. produces products 'X', 'Y', 'Z' and has decided to analyse it's production mix in respect of these three products: 'X', 'Y', 'Z'.

**You have the following information:**

| | X | Y | Z |
|---|---|---|---|
| Direct Material ₹ (per unit) | 160 | 120 | 80 |
| Variable Overheads ₹ (per unit) | 8 | 20 | 12 |
| Direct Labour: | | | |

| Departments: | Rate per hour (₹) | Hours per unit X | Hours per unit Y | Hours per unit Z |
|---|---|---|---|---|
| Department A | 4 | 6 | 10 | 5 |
| Department B | 8 | 6 | 15 | 11 |

From the current budget, further details are as below:

| Particulars | X | Y | Z |
|---|---|---|---|
| Annual production at present (in units) | 10,000 | 12,000 | 20,000 |
| Estimated selling price per unit (₹) | 312 | 400 | 240 |
| Sales departments estimate of possible sales in the coming year (in units) | 12,000 | 16,000 | 24,000 |

There is constraint on supply of labour in Department A and its manpower cannot be increased beyond its present level.

**Required:**

**(i)** Identify the best possible product mix of Moon Ltd.

**(ii)** Calculate the total contribution from the best possible product mix. **[(5 Marks) Nov 2020]**

## Answer

### (i) Statement Showing Best Possible Mix of Moon Ltd.

| Rank | Product | Units/Mix | Labour hours dept. A |
|---|---|---|---|
| I | Product X | 12,000 | 72,000 |
| II | Product Y | 16,000 | 1,60,000 |
| III | Product Z (48,000 ÷ 5) | 9,600 | 48,000 (b.f.) |
| | **Total** | **37,600** | **2,80,000** |

**Best possible mix of X, Y, Z is 12,000 : 16,000 : 9,600**

**(ii) Calculation of contribution from best possible mix:**

Total contribution = 12,000 units of X × 72 + 16,000 units of Y × 100 + 9,600 units of Z × 40
= **₹28,48,000**

**Working note:**

**(1) Calculation of total available labour hours in department A:**

Total available labour hours = 10,000 units of X × 6 hours + 12,000 units of Y × 10 hours + 20,000 units of Z × 5 hours
= 2,80,000 hours

**(2) Calculation of Contribution per labour hour of department A and Rank:**

| Particulars | X | Y | Z |
|---|---|---|---|
| Sale price per unit | 312 | 400 | 240 |
| Less: Direct materials per unit | 160 | 120 | 80 |
| Less: Variable overheads per unit | 8 | 20 | 12 |
| Less: Wages per unit: | | | |
| Department A | 24<br>(6 × 4) | 40<br>(10 × 4) | 20<br>(5 × 4) |
| Department B | 48<br>(6 × 8) | 120<br>(15 × 8) | 88<br>(11 × 8) |
| Contribution per unit | 72 | 100 | 40 |
| ÷ Labour hours per unit of Dept. A | ÷ 6 | ÷ 10 | ÷ 5 |
| Contribution per labour hour Dept. A | 12 | 10 | 8 |
| **Rank** | **I** | **II** | **III** |

## PYQ 29

During a particular period ABC Ltd has furnished the following data:

| | |
|---|---|
| Sales | ₹10,00,000 |
| Contribution to sales ratio | 37% |
| Margin of safety is | 25% of sales |

A decrease in selling price and decrease in the fixed cost could change the "contribution to sales ratio" to 30% and "margin of safety" to 40% of the revised sales.

**Calculate:**

**(1)** Revised Fixed Cost.
**(2)** Revised Sales and
**(3)** New Break-Even Point.

**[(5 Marks) Jan 2021]**

## Answer

| | | | | |
|---|---|---|---|---|
| Contribution to sales ratio (P/V ratio) | = | 37% | | |
| Variable cost ratio | = | 100% - 37% | = | 63% |
| Variable cost | = | ₹10,00,000 × 63% | = | ₹6,30,000 |

After decrease in selling price and fixed cost, sales quantity has not changed. Thus, variable cost is ₹6,30,000.

| | | | | |
|---|---|---|---|---|
| Revised Contribution to sales | = | 30% | | |
| Thus, Variable cost ratio | = | 100% - 30% | = | 70% |
| Thus, Revised sales | = | ₹6,30,000 ÷ 70% | = | ₹9,00,000 |
| Revised Margin of Safety | = | 40% | | |
| Thus, Revised Break-even to sales ratio | = | 100% - 40% | = | 60% |

***(1) Revised Fixed Cost*** = Revised break-even sales × Revised P/V Ratio
= (₹9,00,000 × 60%) × 30% = ***₹1,62,000***

***(2) Revised Sales*** = ***₹9,00,000 (as calculated above)***

***(3) New BEP*** = Revised sales × Revised break-even sales ratio
= ₹9,00,000 × 60% = ***₹5,40,000***

### *PYQ 30*

Two manufacturing companies A and B are planning to merge. The details are as follows:

| | *A* | *B* |
|---|---|---|
| Capacity utilisation (%) | 90 | 60 |
| Sales (₹) | 63,00,000 | 48,00,000 |
| Variable Cost (₹) | 39,60,000 | 22,50,000 |
| Fixed Cost (₹) | 13,00,000 | 15,00,000 |

***Assuming that the proposal is implemented, calculate:***

***(1)*** Break-Even sales of the merged plant and the capacity utilization at that stage.
***(2)*** Profitability of the merged plant at 80% capacity utilization.
***(3)*** Sales Turnover of the merged plant to earn a profit of ₹60,00,000.
***(4)*** When the merged plant is working at a capacity to earn a profit of ₹60,00,000, what percentage of increase in selling price is required to sustain an increase of 5% in fixed overheads.

***[(10 Marks) Jan 2021]***

### *Answer*

***(a) Break-Even sales of the merged plant and the capacity utilization at that stage:***

Break-Even Sales = Fixed Cost ÷ P/V Ratio
= ₹28,00,000 ÷ 45.67% = ***₹61,30,939***

Capacity Utilization = (BEP Sales ÷ Sales at 100% Capacity) × 100
= (₹61,30,939 ÷ ₹1,50,00,000) × 100 = ***40.87%***

***(b) Profitability of merged plant at 80% Capacity:***

Profit = Contribution – Fixed Cost
= {(₹1,50,00,000 × 80%) × 45.67%} - ₹28,00,000
= ***₹26,80,400***

***(c) Sales to earn a profit of ₹60,00,000:***

Sales = (Fixed Cost + Profit) ÷ P/V Ratio
= (₹28,00,000 + ₹60,00,000) ÷ 45.67% = ***₹1,92,68,666***

***(d) % increase in selling price:***

Increase in fixed cost = ₹28,00,000 × 5% = ₹1,40,000

∴ % increase in sales price = (₹1,40,000 ÷ ₹1,92,68,666) × 100 = ***0.727%***

***Working Notes:***

***Calculation of Sales, Variable Cost, P/V Ratio and Fixed Cost at 100% capacity of merged plant:***

| | | | | |
|---|---|---|---|---|
| Sales | = | (₹63,00,000 ÷ 90%) + (₹48,00,000 ÷ 60%) | = | ₹1,50,00,000 |
| Variable Cost | = | (₹39,60,000 ÷ 90%) + (₹22,50,000 ÷ 60%) | = | ₹81,50,000 |
| P/V Ratio | = | (Contribution ÷ Sales) × 100 | | |
| | = | {(₹1,50,00,000 – ₹81,50,000) ÷ ₹1,50,00,000} × 100 | = | 45.67% |
| Fixed Cost | = | ₹13,00,000 + ₹15,00,000 | = | ₹28,00,000 |

## *PYQ 31*

LR Ltd. is considering two alternative methods to manufacture a new product it intends to market. The two methods have a maximum output of 50,000 units each and produce identical items with a selling price of ₹25 each. The costs are:

| *Particulars* | *Method 1 Semi-Automatic* | *Method 2 Fully-Automatic* |
|---|---|---|
| Variable cost per unit | ₹15 | ₹10 |
| Fixed costs | ₹1,00,000 | ₹3,00,000 |

***You are required to calculate:***

***(1)*** Cost Indifference Points in units, Interpret your results.

***(2)*** The Break-even Points of each method in terms of units.

***[(5 Marks) July 2021]***

## *Answer*

***(1)*** Cost Indifference Pont $= \dfrac{\text{Difference in Fixed Costs}}{\text{Difference in Variable Cost per unit}} = \dfrac{3,00,000 - 1,00,000}{15 - 10}$

= ***40,000 units***

***Interpretation:***

| | |
|---|---|
| If expected output < 40,000 units | Select Method 1 |
| If expected output = 40,000 units | Select Any Method |
| If expected output > 40,000 units | Select Method 2 |

| | | | | |
|---|---|---|---|---|
| ***(2)*** Break-even Points in units | = | Fixed cost ÷ Contribution per unit | | |
| Method 1 | = | 1,00,000 ÷ (25 - 15) | = | ***10,000 units*** |
| Method 2 | = | 3,00,000 ÷ (25 - 10) | = | ***20,000 units*** |

## *PYQ 32*

AZ company has prepared its budget for the production of 2,00,000 units. The variable cost per unit is ₹16 and fixed cost is ₹4 per unit. The company fixes its selling price to fetch a profit of 20% on total cost.

***You are required to calculate:***

1. Present break-even sales (in ₹ and in quantity).
2. Present profit-volume ratio.
3. Revised break-even sales in ₹ and the revised profit-volume ratio, if it reduces its selling price by 10%.
4. What would be revised sales -in quantity and the amount, if a company desires a profit increase of 20% more than the budgeted profit and selling price is reduced by 10% as above in point (iii)

***[(10 Marks) Dec 2021]***

## *Answer*

| | | | | |
|---|---|---|---|---|
| ***1.*** Present BEP in ₹ | = | Fixed cost ÷ PV Ratio | | |
| | = | (2,00,000 units × ₹4) ÷ 33.33% | = | ***₹24,00,000*** |

Present BEP in units = Fixed cost ÷ Contribution per unit
= ₹8,00,000 ÷ ₹8 = ***1,00,000 units***

**2.** Present PV Ratio = (Contribution ÷ Sales Price) × 100
= (₹8 ÷ ₹24) × 100 = ***33.33%***

**3.** Revised BEP in ₹ = Fixed cost ÷ Revised PV Ratio
= ₹8,00,000 ÷ 25.9259% = ***₹30,85,714***

Revised PV Ratio = (Revised Contribution ÷ Revised Sales Price) × 100
= (₹5.6 ÷ ₹21.6) × 100 = ***25.9259%***

**4.** Revised Sales in Quantity= (Fixed cost + Desired Profit) ÷ Revised Contribution per unit
= (₹8,00,000 + ₹9,60,000) ÷ ₹5.6 = ***3,14,285.7 units***

Revised Sales in Amount= (Fixed cost + Desired Profit) ÷ Revised PV Ratio
= (₹8,00,000 + ₹9,60,000) ÷ 25.9259% = ***₹67,88,571.42***

***Working Notes:***

***(a)*** Present Sale Price = Cost p.u. + 20%
= (₹16 + ₹4) + 20% = ₹24 per unit

***(b)*** Present Contribution p.u.= Sale Price p.u. – Variable Cost p.u.
= ₹24 – ₹16 = ₹8 per unit

***(c)*** Revised Sale Price = Present Sale Price – 10%
= ₹24 – 10% = ₹21.6 per unit

***(d)*** Revised Contribution p.u.= Revised Sales p.u. –Variable Cost p.u.
= ₹21.6 – ₹16 = ₹5.6 per unit

### *PYQ 33*

Top-tech a manufacturing company is presently evaluating two possible machines for the manufacture of superior Pen-drives. The following information is available:

| *Particulars* | *Machine A (₹)* | *Machine B (₹)* |
|---|---|---|
| Sales price per unit | 400 | 400 |
| Variable cost per unit | 240 | 260 |
| Total fixed cost per year | 350 Lakhs | 200 Lakhs |
| Capacity (in units) | 8,00,000 | 10,00,000 |

***Required:***

**1.** Recommend which machine should be chosen?

**2.** Would you change your answer, if you were informed that the capacities of the two processes are as follows: A - 12,00,000 units; B - 12,00,000 units? Why?

***[(5 Marks) May 2022]***

### *Answer*

**1.** ***Profit (Machine A)*** = Contribution – Fixed cost
= 8,00,000 units × ₹160 (₹400 - ₹240) – ₹3,50,00,000
= ***₹9,30,00,000***

***Profit (Machine B)*** = Contribution – Fixed cost
= 10,00,000 units × ₹140 (₹400 - ₹260) – ₹2,00,00,000
= ***₹12,00,00,000***

***Recommendation:*** Machine B should be chosen as it gives more profit.

**2.** ***Profit (Machine A)*** = Contribution – Fixed cost

= 12,00,000 units × ₹160 (₹400 - ₹240) – ₹3,50,00,000
= ***₹15,70,00,000***

***Profit (Machine B)*** = Contribution – Fixed cost
= 12,00,000 units × ₹140 (₹400 - ₹260) – ₹2,00,00,000
= ***₹14,80,00,000***

Yes, the preference for the machine would change because now, Machine A is having higher contribution and higher profit, hence recommended.

### *PYQ 34*

UV Limited started a manufacturing unit from 1st October 2021. It produces designer lamps and sells its lamps at ₹450 per unit.

During the quarter ending on 31st December, 2021, it produced and sold 12,000 units and suffered a loss of ₹35 per unit.

During the quarter ending on 31st March, 2022, it produced and sold 30,000 units and earned a profit of ₹40 per unit.

***You are required to calculate:***

***(a)*** Total fixed cost incurred by UV ltd. per quarter.
***(b)*** Break Even sales value (in rupees)
***(c)*** Calculate Profit, if the sale volume reaches 50,000 units in the next quarter (i.e., quarter ending on 30th June, 2022).

***[(5 Marks) May 2022]***

### *Answer*

***(a) Fixed Cost per quarter (by using data of quarter ending 31st March, 2022):***

***Fixed cost*** = Contribution – profit
= 30,000 units × 450 × 20% - 30,000 × 40 = ***₹15,00,000***

***(b) Calculation of Break Even Point:***

$$BEP = \frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{15,00,000}{20\%} = ₹75,00,000$$

***(c) Calculation of profit at 50,000 units:***

***Profit*** = Contribution – Fixed cost
= 50,000 × 450 × 20% - 15,00,000 = ***₹30,00,000***

***Working Notes:***

$$\text{PV Ratio} = \frac{\text{Difference in Profit}}{\text{Difference in Sales}} \times 100 = \frac{30,000 \times 40 + 12,000 \times 35}{(30,000 - 12,000) \times 450} = 20\%$$

### *PYQ 35*

ABC Ltd, sell its Product 'Y' at a price of ₹300 per unit and its variable cost is ₹180 per unit. The fixed costs are ₹16,80,000 per year uniformly incurred throughout the year, The Profit for the year is ₹7,20,000.

***You are required to calculate:***

***(a)*** BEP in value (₹) and units.
***(b)*** Margin of Safety
***(c)*** Profits made when sales are 24,000 units,
***(d)*** Sales in value (₹) to be made to earn a net profit of ₹10,00,000 for the year.

***[(5 Marks) Nov 2022]***

***Answer***

***(a) BEP in value (₹) and units:***

| | | | | |
|---|---|---|---|---|
| BEP in value (₹) | = | Fixed Cost ÷ P/V Ratio | | |
| | = | ₹16,80,000 ÷ 40% | = | ***₹42,00,000*** |
| BEP in units | = | Fixed Cost ÷ Contribution per unit | | |
| | = | ₹16,80,000 ÷ 120 (300 - 180) | = | ***14,000 units*** |

***(b) Margin of Safety:***

| | | | | |
|---|---|---|---|---|
| MOS in value (₹) | = | Profit ÷ P/V Ratio | | |
| | = | ₹7,20,000 ÷ 40% | = | ***₹18,00,000*** |

***(c) Profit at 24,000 units:***

| | | | | |
|---|---|---|---|---|
| Profit | = | Contribution – Fixed cost | | |
| | = | (24,000 × ₹120) – ₹16,80,000 | = | ***₹12,00,000*** |

***(d) Sales in value (₹) to earn a profit of ₹10,00,000:***

| | | | | |
|---|---|---|---|---|
| Sales in value (₹) | = | (Fixed Cost + Profit) ÷ P/V Ratio | | |
| | = | (₹16,80,000 + ₹10,00,000) ÷ 40% | = | ***₹67,00,000*** |

***Working Note:***

***P/V Ratio*** $= \frac{\text{Contribution}}{\text{Sale Price}} \times 100 = \frac{300 - 180}{300} \times 100 =$ ***40%***

***PYQ 36***

An agriculture based company having 210 hectares of land is engaged in growing three different cereals namely, wheat, rice, and maize annually. The yield of the different crops and their selling prices are given below:

| ***Particulars*** | ***Wheat*** | ***Rice*** | ***Maize*** |
|---|---|---|---|
| Yield (in kgs per hectare) | 2,000 | 500 | 100 |
| Selling price (₹ per kg) | 20 | 40 | 250 |

***The variable cost data of different crops are given below:***

(All figures in ₹ per kg)

| ***Particulars*** | ***Wheat*** | ***Rice*** | ***Maize*** |
|---|---|---|---|
| Labour charges | 8 | 10 | 120 |
| Packing materials | 2 | 2 | 10 |
| Other variable expenses | 4 | 1 | 20 |

The company has a policy to produce and sell all the three kinds of crops. The maximum and minimum area to be cultivated for each crop is as follows:

| ***Particulars*** | ***Wheat*** | ***Rice*** | ***Maize*** |
|---|---|---|---|
| Maximum area in hectares | 160 | 50 | 60 |
| Minimum area in hectares | 100 | 40 | 10 |

***You are required to:***

***(a)*** Rank the crops on the basis of contribution per hectare.
***(b)*** Determine the optimum product mix considering that all the three cereals are to be produced.
***(c)*** Calculated the maximum profit which can be achieved if the total fixed cost per annum is ₹21,45,000. (Assume that there are no other constraints applicable to this company)

***[(10 Marks) Nov 2022]***

***Answer***

**(a) Statement Showing Rank on the basis of Contribution per Hectare**

| Particulars | Wheat | Rice | Maize |
|---|---|---|---|
| Sale price per kg | 20 | 40 | 250 |
| Less: Labour charges per kg | (8) | (10) | (120) |
| Less: Packing materials per kg | (2) | (2) | (10) |
| Less: Other variable expenses per kg | (4) | (1) | (20) |
| Contribution per kg | 6 | 27 | 100 |
| × Yield in kg per hectare | × 2,000 | × 500 | × 100 |
| Contribution per Hectare | 12,000 | 13,500 | 10,000 |
| **Rank** | **II** | **I** | **III** |

**(b) Statement Showing Optimum Product Mix**

| Cereals | Rank | Minimum Area | Additional Area | Total Area | Yield per Hectare | Production in kgs. |
|---|---|---|---|---|---|---|
| Wheat | II | 100 | 50 (b.f.) | 150 | 2,000 | 3,00,000 |
| Rice | I | 40 | 50 – 40 = 10 | 50 | 500 | 25,000 |
| Maize | III | 10 | - | 10 | 100 | 1,000 |
| **Total** | | **150** | **60** | **210** | **-** | **3,26,000** |

**(c) Maximum Profit** = (3,00,000 kgs × ₹6) + (25,000 kgs × ₹27) + (1,000 kgs × ₹100) – ₹21,45,000
= **₹4,30,000**

**PYQ 37**

The following information pertains to ZB Limited for the year:

| | |
|---|---|
| Profit volume ratio | 30% |
| Margin of Safety (as % of total sales) | 25% |
| Fixed Cost | ₹12,60,000 |

**You are required to calculate:**

**(a)** Break even sales value (₹),
**(b)** Total sales value (₹) at present,
**(c)** Proposed sales value (₹) if company wants to earn the present profit after reduction of 10% in fixed cost,
**(d)** Sales in value (₹) to be made to earn a profit of 20% on sales assuming fixed cost remains unchanged,
**(e)** New Margin of Safety if the sales value at present as computed in (b) decreased by 12.5%.

**[(5 Marks) May 2023]**

**Answer**

**(a) Break even sales** $= \frac{\text{Fixed cost}}{\text{PV Ratio}} = \frac{12,60,000}{30\%} =$ **₹42,00,000**

**(b) Total sales at present** $= \frac{\text{BEP Sales}}{\text{BEP as \% of Total Sales}} = \frac{42,00,000}{75\%}$
= **₹56,00,000**

**(c) Proposed Sales** $= \frac{\text{Revised Fixed cost} + \text{Desired Profit}}{\text{PV Ratio}}$
$= \frac{(12,60,000 - 10\%) + 4,20,000}{30\%} =$ **₹51,80,000**

**(d) Desired Sales Value** $= \frac{\text{Fixed cost}}{\text{PV ratio} - \text{\% of Profit to Sales}} = \frac{12,60,000}{30\% - 20\%}$
= **₹1,26,00,000**

***(e) New Margin of Safety*** = Revised Sales – BEP Sales
= (56,00,000 – 12.5%) – 42,00,000 = ***₹7,00,000***

***WN:***

Existing Profit = MOS × PV Ratio = ₹56,00,000 × 25% × 30%
= ₹4,20,000

## *PYQ 38*

MNP Company Limited produces two products 'A' and 'B'. The relevant cost and sales data per unit of output is as follows:

| ***Particulars*** | ***Product A (₹)*** | ***Product B (₹)*** |
|---|---|---|
| Direct material | 55 | 60 |
| Direct labour | 35 | 45 |
| Variable factory overheads | 40 | 20 |
| Selling Price | 180 | 175 |

The availability of machine hours is limited to 55,000 hours for the month. The monthly demand for product 'A' and product 'B' is 5,000 units and 6,000 units, respectively. The fixed expense of the company are ₹1,40,000 per month. Variable factory overheads are ₹4 per machine hour. The company can produce both products according to the market demand.

***Calculate the product mix that generates maximum profit for the company in the given situation and also calculate profit of the company.***

***[(5 Marks) May 2023]***

## *Answer*

***Statement Showing Best Possible Mix and Profit of MNP Company Ltd.***

| ***Rank*** | ***Product*** | ***Units/Mix*** | ***Machine hours*** | ***Contribution*** |
|---|---|---|---|---|
| I | Product B | 6,000 | 30,000 | 3,00,000 |
| II | Product A (25,000 hours ÷ 10) | 2,500 | 25,000 (b.f.) | 1,25,000 |
| | Total | 8,500 | 55,000 | |
| | Total Contribution | | | 4,25,000 |
| | Less: Fixed Expenses | | | (1,40,000) |
| | ***Profit*** | | | ***2,85,000*** |

***Working notes:***

***Calculation of Contribution per machine hour and Rank:***

| ***Particulars*** | ***A*** | ***B*** |
|---|---|---|
| Sale price per unit | 180 | 175 |
| Less: Direct materials per unit | 55 | 60 |
| Less: Direct labour per unit | 35 | 45 |
| Less: Variable overheads per unit | 40 | 20 |
| Contribution per unit | 50 | 50 |
| ÷ Machine hours per unit (40 ÷ 4) and (20 ÷ 4) | ÷ 10 | ÷ 5 |
| Contribution per machine hour | 5 | 10 |
| ***Rank*** | ***II*** | ***I*** |

# SUGGESTED REVISION

| Ques. No. | Observations or KEY Points (Note down during revisions) | Page No. of Practical Register | 1st & 2nd Revision | 3rd, 4th & 5th Revision | Revision during Exams |
|---|---|---|---|---|---|
| BQ (Book Questions covering Study Module of ICAI, PM, RTP's, MTP's and Important Questions) | | | | | |
| 1 | | | Y | Y | - |
| 2 | | | Y | - | - |
| 3 | | | Y | Y | - |
| 4 | | | Y | - | - |
| 5 | | | Y | Y | - |
| 6 | | | Y | Y | - |
| 7 | | | Y | - | - |
| 8 | | | Y | Y | Y |
| 9 | | | Y | Y | - |
| 10 | | | Y | - | - |
| 11 | | | Y | Y | - |
| 12 | | | Y | - | - |
| 13 | | | Y | Y | Y |
| 14 | | | Y | - | - |
| 15 | | | Y | - | - |
| 16 | | | Y | - | - |
| 17 | | | Y | Y | Y |
| 18 | | | Y | Y | - |
| 19 | | | Y | Y | Y |
| 20 | | | Y | Y | Y |
| 21 | | | Y | Y | Y |
| 22 | | | Y | Y | - |
| 23 | | | Y | Y | Y |
| 24 | | | Y | Y | Y |
| 25 | | | Y | Y | - |
| 26 | | | Y | Y | Y |
| 27 | | | Y | Y | Y |
| 28 | | | Y | Y | Y |
| 29 | | | Y | - | - |
| 30 | | | Y | Y | Y |
| 31 | | | Y | Y | Y |
| 32 | | | Y | - | - |
| 33 | | | Y | Y | - |
| 34 | | | Y | Y | Y |
| 35 | | | Y | Y | Y |
| 36 | | | Y | - | - |
| 37 | | | Y | Y | - |
| 38 | | | Y | Y | Y |
| 39 | | | Y | Y | Y |
| 40 | | | Y | Y | Y |
| 41 | | | Y | Y | Y |
| 42 | | | Y | Y | Y |
| 43 | | | Y | Y | Y |
| 44 | | | Y | Y | - |
| 45 | | | Y | Y | Y |
| 46 | | | Y | Y | Y |
| 47 | | | Y | Y | - |
| 48 | | | Y | Y | Y |

| | | | | | |
|---|---|---|---|---|---|
| 49 | | | Y | Y | - |
| 50 | | | Y | Y | Y |
| 51 | | | Y | Y | Y |
| 52 | | | Y | Y | - |
| 53 | | | Y | Y | Y |
| 54 | | | Y | Y | - |
| 55 | | | Y | Y | - |
| 56 | | | Y | Y | - |
| 57 | | | Y | Y | - |
| 58 | | | Y | Y | - |
| PYQ (Past Year Questions) | | | | | |
| 1 | | | Y | - | - |
| 2 | | | Y | Y | Y |
| 3 | | | Y | Y | Y |
| 4 | | | Y | Y | - |
| 5 | | | Y | Y | Y |
| 6 | | | Y | Y | Y |
| 7 | | | Y | Y | Y |
| 8 | | | Y | - | - |
| 9 | | | Y | Y | - |
| 10 | | | Y | - | - |
| 11 | | | Y | - | - |
| 12 | | | Y | Y | - |
| 13 | | | Y | Y | Y |
| 14 | | | Y | Y | Y |
| 15 | | | Y | Y | Y |
| 16 | | | Y | Y | Y |
| 17 | | | Y | - | - |
| 18 | | | Y | Y | Y |
| 19 | | | Y | Y | - |
| 20 | | | Y | Y | Y |
| 21 | | | Y | Y | Y |
| 22 | | | Y | - | - |
| 23 | | | Y | Y | Y |
| 24 | | | Y | - | - |
| 25 | | | Y | Y | - |
| 26 | | | Y | Y | Y |
| 27 | | | Y | - | - |
| 28 | | | Y | - | - |
| 29 | | | Y | Y | Y |
| 30 | | | Y | Y | Y |
| 31 | | | Y | Y | - |
| 32 | | | Y | Y | - |
| 33 | | | Y | - | - |
| 34 | | | Y | - | - |
| 35 | | | Y | - | - |
| 36 | | | Y | Y | Y |
| 37 | | | Y | Y | - |
| 38 | | | Y | Y | - |

# CHAPTER - 14

# COST ACCOUNTING SYSTEM

## LEARNING OBJECTIVES

*After studying this chapter, you should be able to*

- *Differentiate between integrated and non-integrated systems of accounting.*
- *Identify the ledgers maintained by financial as well as cost departments.*
- *Understand the reasons for differences between financial and cost accounts.*
- *Should be in a position to write the various journal entries for both integrated and non-integrated systems of accounting.*

# INTEGRATED ACCOUNTING SYSTEM

### BQ 1

From the following details show the necessary accounts by using integrated accounting system:

| Stock: | Materials | WIP | Finished Stock |
|---|---|---|---|
| Opening Balance | 8,000 | 5,000 | 10,000 |
| Closing Balance | 11,000 | 9,000 | 12,000 |

***Transactions during the period:***

| | |
|---|---|
| Materials purchased | 25,000 |
| Wages paid (including ₹2,000 indirect) | 10,000 |
| Overheads incurred | 8,000 |
| Overheads absorbed | 9,000 |
| Sales | 50,000 |

***[Factory OH Under Recovery 1,000; Net Profit 16,000]***

### BQ 2

In the absence of the chief Accountants you have been asked to prepare a month's cost accounts for a company which operates a batch costing system fully integrated with the financial accounts. The following relevant information is provided to you:

***Balances at the beginning of the month:***

| | |
|---|---|
| Stores ledger control Account | 25,000 |
| Work in progress control account | 20,000 |
| Finished goods control account | 35,000 |
| Prepaid production overheads brought forward from previous month | 3,000 |

***Transactions during the month:***

| | | |
|---|---|---|
| Materials purchased | | 75,000 |
| Materials Issued: | | |
| To Production | 30,000 | |
| To factory Maintenance | 4,000 | 34,000 |
| Materials transferred between batches | | 5,000 |
| Total wages paid: | | |
| To direct workers | 25,000 | |
| To Indirect workers | 5,000 | 30,000 |
| Direct wages charged to batches | | 20,000 |
| Recorded non-productive time of direct workers | | 5,000 |
| Selling and distribution overheads incurred | | 6,000 |
| Other production overheads incurred | | 12,000 |
| Sales | | 1,00,000 |
| Cost of finished goods sold | | 80,000 |
| Cost of goods completed and transferred into Finished goods during the month | | 65,000 |
| Physical value of work in progress at the end of month | | 40,000 |

The production overhead absorption rate is 150% of direct wages charged to work in progress.

***Prepare the following accounts for the month:***

*(a)* Stores ledger control account.
*(b)* Work in progress control account.
*(c)* Finished goods control account.
*(d)* Production overheads control account.
*(e)* Profit and loss account.

***[(a) ₹66,000 (b) ₹40,000 (c) ₹20,000 (d) Over absorption taken to P/L A/c ₹1,000 (e) ₹20,000]***

### BQ 3

Bangalore Petrochemicals Co. keeps books on integrated accounting system. The following balance appears in the books as on 1st January, 2023.

| *Particulars* | *Dr.* | *Cr.* |
|---|---|---|
| Stores control A/c | 18,000 | - |
| Work-in-progress A/c | 17,000 | - |
| Finished goods A/c | 13,000 | - |
| Bank A/c | 10,000 | - |
| Creditors A/c | - | 8,000 |
| Fixed assets A/c | 55,000 | - |
| Debtors A/c | 12,000 | - |
| Share Capital A/c | - | 80,000 |
| Depreciation provision A/c | - | 5,000 |
| Profit and loss A/c | - | 32,000 |
| ***Total*** | ***1,25,000*** | ***1,25,000*** |

***Transactions for the year ended 31st December 2023 were as given below:***

| | | |
|---|---|---|
| Wages-direct | 87,000 | |
| Wages-indirect | 5,000 | 92,000 |
| Purchase of materials (on credit) | | 1,00,000 |
| Materials issued to production | | 1,10,000 |
| Materials for repairs | | 2,000 |
| Goods finished during the year (at cost) | | 2,15,000 |
| Sales (credit) | | 3,00,000 |
| Cost of goods sold | | 2,20,000 |
| Production overhead absorbed | | 48,000 |
| Production overhead incurred | | 40,000 |
| Administration overhead incurred | | 12,000 |
| Selling overhead incurred | | 14,000 |
| Payments of creditors | | 1,01,000 |
| Payments of debtors | | 2,90,000 |
| Depreciation of machinery | | 1,300 |
| Prepaid rent (included in factory overheads) | | 300 |

***Write up accounts in the integrated ledger and prepare in trial balance.***

***[SLC 6,000; WIP 47,000; Finished good: 20,000; Net Profit 66,000; Debtors 22,000; Creditor 7,000; Cash 41,000, Trial Balance 1,91,300]***

## *BQ 4*

The following incomplete accounts are furnished to you for the month ended 31st October, 2023:

***Creditors for Purchases Account***

| | | | |
|---|---|---|---|
| | | 01.10.23 By Balance | 30,000 |

***Stores Control Account***

| | | | |
|---|---|---|---|
| 01.10.23 To Balance | 54,000 | | |

***Factory overheads Control Account***

| | | | |
|---|---|---|---|
| Total debits for October, 2023 | 45,000 | | |

***Work in progress control Account***

| | | | |
|---|---|---|---|
| 01.10.23 To Balance | 6,000 | | |

***Finished Goods Control Account***

| | | | |
|---|---|---|---|
| 01.10.23 To Balance | 75,000 | | |

***Additional information:***

*(i)* The factory overheads are applied by using a budgeted rate based on direct labour hours. The budget for overheads for 2023 is ₹6,75,000 and the budget of direct labour hours is 4,50,000.

*(ii)* The balance in the account of creditors for purchases on 31.10.23 is ₹15,000 and the payments made to creditors in October, 2023 amount to ₹1,05,000.

*(iii)* The finished goods inventory as on 31st October, 2023 is ₹66,000.

*(iv)* The cost of goods sold during the month was ₹1,95,000.

*(v)* On 31st October, 2023 there was only one unfinished job in the factory. The cost records show that ₹3,000 (1,200 direct labour hours) of direct labour cost and ₹6,000 of direct material cost had been charged.

*(vi)* A total of 28,200 direct labour hours were worked in October, 2023. All factory workers earn same rate of pay.

*(vii)* All actual factory overheads incurred in October, 2023 have been posted.

***You are required to find:***

*(a)* Materials purchased during October, 2023.

*(b)* Cost of goods completed in October, 2023.

*(c)* Overheads applied to production in October, 2023.

*(d)* Balance of work in progress on 31st October, 2023.

*(e)* Direct materials consumed during October, 2023.

*(f)* Balance of Stores Control account on 31st October, 2023.

*(g)* Over absorbed or under absorbed overheads for October, 2023.

***[(a) 90,000 (b) 1,86,000 (c) 42,300 (d) 10,800 (e) 78,000 (f) 66,000 (g) 2,700 under-recovered]***

## BQ 5

A fire destroyed some accounting records of a company. You have been able to collect the following from the spoilt papers/records and as a result of consultation with accounting staff in respect of January, 2017.

***Incomplete Ledger Entries:***

***Materials Control A/c***

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Balance b/d | 32,000 | | |

***Work-in-Progress Control A/c***

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Balance b/d | 9,200 | By Finished Goods Control A/c | 1,51,000 |

***Payable (Creditors) A/c***

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Balance c/d | 19,200 | By Balance b/d | 16,400 |

***Manufacturing Overheads Control A/c***

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Bank A/c<br>(Amount Spent) | 29,600 | | |

***Finished Goods Control A/c***

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Balance b/d | 24,000 | By Balance c/d | 30,000 |

***Additional Information:***

1. The cash-book showed that ₹89,200 have been paid to creditors for raw-material.
2. Ending inventory of work-in-progress included material ₹5,000 on which 300 direct labour hours have been booked against wages and overheads.

3. The job card showed that workers have worked for 7,000 hours. The wage rate is ₹10 per labour hour.
4. Overhead recovery rate was ₹4 per direct labour hour.

***You are required to complete the above accounts in the cost ledger of the company.***

## *Answer*

### *Materials Control A/c*

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Balance b/d | 32,000 | By WIP Ledger Control A/c (figure from WIP A/c) | 53,000 |
| To Payables/Creditors A/c (WN) (Purchases) | 92,000 | By Balance b/d | 71,000 |
| | **1,24,000** | | **1,24,000** |

### *WIP Ledger Control A/c*

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Balance b/d | 9,200 | By Finished Goods Control A/c | 1,51,000 |
| To Materials Control A/c (b.f.) | 53,000 | By Balance c/d: | |
| To Wages Control A/c (7,000 hrs × ₹10) | 70,000 | Material ₹5,000 | |
| | | Labour (300 hrs × ₹10) ₹3,000 | |
| To Manufacturing OH Control A/c | 28,000 | Overheads (300 hrs × ₹4) ₹1,200 | 9,200 |
| | **1,60,200** | | **1,60,200** |

### *Manufacturing Overheads Control A/c*

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Bank A/c | 29,600 | By WIP Ledger Control A/c (7,000 hrs × ₹4) | 28,000 |
| | | By Costing P/L A/c (Under-absorbed Overheads) | 1,600 |
| | **29,600** | | **29,600** |

### *Finished Goods Control A/c*

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Balance b/d | 24,000 | By Cost of Sales A/c (b.f.) | 1,45,000 |
| To Work-in-progress Control A/c | 1,51,000 | By Balance c/d | 30,000 |
| | **1,75,000** | | **1,75,000** |

***Working note:***

### *Payables (Creditors) A/c*

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Cash or Bank A/c | 89,200 | By Balance b/d | 16,400 |
| To Balance c/d | 19,200 | By Material Control A/c (Purchase/Balancing figure) | 92,000 |
| | **1,08,400** | | **1,08,400** |

## *BQ 6*

***Journalise the following transactions assuming that cost and financial transactions are integrated:***

| Details of Transactions | (₹) |
|---|---|
| Raw materials purchased | 2,00,000 |
| Direct materials issued to production | 1,50,000 |
| Wages paid (30% indirect) | 1,20,000 |
| Wages charged to production | 84,000 |
| Manufacturing expenses incurred | 84,000 |
| Manufacturing overhead charged to production | 92,000 |
| Selling and distribution costs | 20,000 |
| Finished products (at cost) | 2,00,000 |
| Sales | 2,90,000 |

| | |
|---|---|
| Closing stock | Nil |
| Receipts from debtors | 69,000 |
| Payments to creditors | 1,10,000 |

## Answer

### Journal Entries

| Entries | | Dr. | Cr. |
|---|---|---|---|
| Stores Ledger Control A/c | Dr. | 2,00,000 | |
| To Payables (Creditors)/Bank A/c | | | 2,00,000 |
| (Being materials purchased) | | | |
| Work-in-progress Ledger Control A/c | Dr. | 1,50,000 | |
| To Stores Ledger Control A/c | | | 1,50,000 |
| (Being direct materials issued to production) | | | |
| Wages Control A/c | Dr. | 1,20,000 | |
| To Bank A/c | | | 1,20,000 |
| (Being wages paid) | | | |
| Work-in-progress Ledger Control A/c | Dr. | 84,000 | |
| Factory Overhead Control A/c | Dr. | 36,000 | |
| To Wages Control A/c | | | 1,20,000 |
| (Being allocation of direct and indirect wages) | | | |
| Factory Overhead Control A/c | Dr. | 84,000 | |
| To Bank A/c | | | 84,000 |
| (Being manufacturing overheads incurred) | | | |
| Work-in-progress Ledger Control A/c | Dr. | 92,000 | |
| To Factory Overhead Control A/c | | | 92,000 |
| (Being manufacturing overheads charged to production) | | | |
| Selling and Distribution Overhead Control A/c | Dr. | 20,000 | |
| To Bank A/c | | | 20,000 |
| (Being selling and distribution cost incurred) | | | |
| Finished Goods Control A/c | Dr. | 2,00,000 | |
| To Work-in-progress Ledger Control A/c | | | 2,00,000 |
| (Being cost of finished goods transferred to finished goods account) | | | |
| Cost of Sales A/c | Dr. | 2,20,000 | |
| To Finished Goods Control A/c | | | 2,00,000 |
| To Selling and Distribution Overhead Control A/c | | | 20,000 |
| (Being cost of goods sold) | | | |
| Receivables/Debtors/Bank A/c | Dr. | 2,90,000 | |
| To Sales A/c | | | 2,90,000 |
| (Being finished stock sold) | | | |
| Bank A/c | Dr. | 69,000 | |
| To Receivables/Debtors A/c | | | 69,000 |
| ( Being collection received from debtors) | | | |
| Payables/Creditors A/c | Dr. | 1,10,000 | |
| To Bank A/c | | | 1,10,000 |
| ( Being payments made to creditors) | | | |

## BQ 7

Dutta Enterprises operates an integral system of accounting. You are required to pass the Journal Entries for the following transactions that took place for the year ended 30th June, 2023.

| Details of Transactions | (₹) |
|---|---|
| Raw materials purchased (50% on credit) | 6,00,000 |
| Materials issued to production | 4,00,000 |
| Wages paid (50% indirect) | 2,00,000 |
| Wages charged to production | 1,00,000 |
| Factory overheads incurred | 80,000 |
| Factory overheads charged to production | 1,00,000 |

| | |
|---|---|
| Selling and distribution overheads incurred | 40,000 |
| Finished goods at cost | 5,00,000 |
| Sales (50% on credit) | 7,50,000 |
| Closing stock | Nil |
| Receipts from debtors | 2,00,000 |
| Payments to creditors | 2,00,000 |

(Narrations are not required.)

## Answer

### Journal Entries

| Entries | | Dr. | Cr. |
|---|---|---|---|
| Stores Ledger Control A/c | Dr. | 6,00,000 | |
| To Payables/Creditors A/c | | | 3,00,000 |
| To Bank A/c | | | 3,00,000 |
| Work-in-progress Ledger Control A/c | Dr. | 4,00,000 | |
| To Stores Ledger Control A/c | | | 4,00,000 |
| Wages Control A/c | Dr. | 2,00,000 | |
| To Bank A/c | | | 2,00,000 |
| Work-in-progress Ledger Control A/c | Dr. | 1,00,000 | |
| To Wages Control A/c | | | 1,00,000 |
| Factory Overhead Control A/c | Dr. | 1,00,000 | |
| To Wages Control A/c | | | 1,00,000 |
| Factory Overhead Control A/c | Dr. | 80,000 | |
| To Bank A/c | | | 80,000 |
| Work-in-progress Ledger Control A/c | Dr. | 1,00,000 | |
| To Factory Overhead Control A/c | | | 1,00,000 |
| Selling and Distribution Overhead Control A/c | Dr. | 40,000 | |
| To Bank A/c | | | 40,000 |
| Finished Goods Control A/c | Dr. | 5,00,000 | |
| To Work-in-progress Ledger Control A/c | | | 5,00,000 |
| Cost of Sales A/c | Dr. | 5,40,000 | |
| To Finished Goods Control A/c | | | 5,00,000 |
| To Selling and Distribution Overhead Control A/c | | | 40,000 |
| Receivables/Debtors A/c | Dr. | 3,75,000 | |
| Bank A/c | Dr. | 3,75,000 | |
| To Sales A/c | | | 7,50,000 |
| Bank A/c | Dr. | 2,00,000 | |
| To Receivables/Debtors A/c | | | 2,00,000 |
| Payables/Creditors A/c | Dr. | 2,00,000 | |
| To Bank A/c | | | 2,00,000 |

# NON INTEGRATED ACCOUNTING SYSTEM

## BQ 8

On 31st March, 2023 the following balances were extracted from the books of the Supreme Manufacturing Company.

| Name of Account | Dr. | Cr. |
|---|---|---|
| Stores Ledger Control A/c | 35,000 | - |
| Work in progress Control A/c | 38,000 | - |
| Finished Stock Ledger Control A/c | 25,000 | - |
| Cost Ledger Control A/c | - | 98,000 |
| **Total** | **98,000** | **98,000** |

***The following transactions took place in April 2023:***

Raw Materials:

| | |
|---|---|
| Purchased | 95,000 |

| | |
|---|---|
| Returned to suppliers | 3,000 |
| Issued to production | 98,000 |
| Returned to stores | 3,000 |
| Productive wages | 40,000 |
| Indirect labour | 25,000 |
| Factory overheads expenses incurred | 50,000 |
| Selling and administrative expenses | 40,000 |
| Cost of finished goods transferred to warehouse | 2,13,000 |
| Cost of Goods sold | 2,10,000 |
| Sales | 3,00,000 |

Factory overheads are applied to production at 150% of direct wages, any under/over absorbed overhead being carried forward for adjustment in the subsequent months. All administrative and selling expenses are treated as period costs and charged off to the profit and loss account of the month in which they are incurred.

***Show the following Accounts:***

***(a)*** Cost ledger control A/c
***(b)*** Stores ledger control A/c
***(c)*** Work in progress control A/c
***(d)*** Finished goods stock control A/c
***(e)*** Factory overhead control A/c
***(f)*** Costing profit and loss A/c
***(g)*** Trial balance as at 30th April, 2023

***[(a) 95,000 (b) 32,000 (c) 20,000 (d) 28,000 (e) 15,000 (f) 50,000 (g) 95,000]***

***BQ 9***

As on 31st March, 2023, the following balance existed in a firm's cost Ledger:

| *Name of Account* | *Dr.* | *Cr.* |
|---|---|---|
| Stores Ledger Control A/c | 3,01,435 | - |
| Work in progress Control A/c | 1,22,365 | - |
| Finished Stock Ledger Control A/c | 2,51,945 | - |
| Manufacturing Overhead Control A/c | - | 10,525 |
| Cost Ledger Control A/c | - | 6,65,220 |
| ***Total*** | ***6,75,745*** | ***6,75,745*** |

***During the next three months the following items arose:***

| | |
|---|---|
| Finished product (at cost) | 2,10,835 |
| Manufacturing overhead incurred | 91,510 |
| Raw materials purchased | 1,23,000 |
| Factory Wages | 50,530 |
| Indirect Labour | 21,665 |
| Cost of sales | 1,85,890 |
| Material issued to production | 1,27,315 |
| Sales returned at Cost | 5,380 |
| Material returned to suppliers | 2,900 |
| Manufacturing overhead charged to production | 77,200 |

***You are required to pass the Journal Entries; write up the accounts and schedule the balances, stating what each balance represents.***

***[SLC 2,94,220; WIP 1,66,575; Finished Stock 2,82,270; Manufacturing OH 25,450; COS 1,80,510; CLC 9,49,025]***

***BQ 10***

The following balances were extracted from a company's ledger as on 31st December 2023:

| *Name of Account* | *Dr.* | *Cr.* |
|---|---|---|
| Raw materials control A/c | 48,836 | - |

| | | |
|---|---|---|
| Work in progress control A/c | 14,745 | - |
| Finished stock ledger control A/c | 21,980 | - |
| Nominal ledger control A/c | - | 85,561 |
| ***Total*** | ***85,561*** | ***85,561*** |

***Further transactions took place during the following quarter as follows:***

| | |
|---|---|
| Direct wages | 18,370 |
| Factory overhead allocated to WIP | 11,786 |
| Goods Finished at cost | 36,834 |
| Raw materials purchased | 22,422 |
| Cost of goods sold | 42,000 |
| Raw materials issued to production | 17,000 |
| Raw materials credited by suppliers | 1,000 |
| Inventory audit raw material losses | 1,300 |
| WIP rejected (with no scrap value) | 1,800 |
| Customer's return (at cost) of finished goods | 3,000 |

***Prepare all the ledger accounts in cost ledger.***

***[SLC 51,958; WIP 23,267; Finished goods 19,814; COS 39,000; NLC 1,34,039]***

## *BQ 11*

Acme Manufacturing Co. Ltd. opens the costing records, with the balances as on 1st July as follows:

| *Name of Account* | *Dr.* | *Cr.* |
|---|---|---|
| Material Control A/c | 1,24,000 | - |
| Work-in-process | 62,500 | - |
| Finished Goods A/c | 1,24,000 | - |
| Production Overheads A/c | 8,400 | - |
| Administration Overhead | - | 12,000 |
| Selling and Distribution Overhead A/c | 6,250 | - |
| Cost Ledger Control A/c | - | 3,13,150 |
| ***Total*** | ***3,25,150*** | ***3,25,150*** |

The following are the transactions for the quarter ended 30th September:

| *Particulars* | *₹* |
|---|---|
| Materials purchased | 4,80,100 |
| Materials issued to jobs | 4,77,400 |
| Materials to works maintenance | 41,200 |
| Materials to administration office | 3,400 |
| Materials to sales department | 7,200 |
| Wages direct | 1,49,300 |
| Wages indirect | 65,000 |
| Transportation for indirect materials | 8,400 |
| Production overheads | 2,42,250 |
| Absorbed production overheads | 3,59,100 |
| Administration overheads incurred | 74,000 |
| Administration allocation to production | 52,900 |
| Administration allocation to sales department | 14,800 |
| Selling & Distribution overheads incurred | 64,200 |
| Selling & Distribution overheads absorbed | 82,000 |
| Finished goods produced | 9,58,400 |
| Finished goods sold | 9,77,300 |
| Sales | 14,43,000 |

***Make up the various accounts as you envisage in the Cost Ledger and prepare a Trial Balances as at 30th September.***

**Answer**

**Material Control A/c**

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Balance b/d | 1,24,000 | By Work-in-process control A/c | 4,77,400 |
| To Cost ledger control A/c (Purchases) | 4,80,100 | By Production OH control A/c | 41,200 |
| | | By Administration OH control A/c | 3,400 |
| | | By S & D OH control A/c | 7,200 |
| | | By Balance c/d | 74,900 |
| | **6,04,100** | | **6,04,100** |

**Wages Control A/c**

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Cost ledger control A/c (₹1,49,300 + ₹65,000) | 2,14,300 | By Work-in-process control A/c | 1,49,300 |
| | | By Production OH control A/c | 65,000 |
| | **2,14,300** | | **2,14,300** |

**Production Overhead Control A/c**

| Particulars | | ₹ | Particulars | ₹ |
|---|---|---|---|---|
| To Balance b/d | | 8,400 | By Work-in-process control A/c | 3,59,100 |
| To Cost Ledger control A/c: | | | By Balance c/d | 6,150 |
| Transportation | 8,400 | | | |
| Production overheads | 2,42,250 | 2,50,650 | | |
| To Wages control A/c | | 65,000 | | |
| To Material control A/c | | 41,200 | | |
| | | **3,65,250** | | **3,65,250** |

**Work-in-Progress Control A/c**

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Balance b/d | 62,500 | By Finished goods control A/c | 9,58,400 |
| To Material control A/c | 4,77,400 | By Balance c/d | 89,900 |
| To Wages control A/c | 1,49,300 | | |
| To Production OH control A/c | 3,59,100 | | |
| | **10,48,300** | | **10,48,300** |

**Administration Overhead Control A/c**

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Cost Ledger control A/c | 74,000 | By Balance b/d | 12,000 |
| To Material control A/c | 3,400 | By Finished goods control A/c | 52,900 |
| To Balance c/d | 2,300 | By Cost of sales A/c | 14,800 |
| | **79,700** | | **79,700** |

**Finished Goods Control A/c**

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Balance c/d | 1,24,000 | By Cost of sales A/c | 9,77,300 |
| To Work-in-process A/c | 9,58,400 | By Balance c/d | 1,58,000 |
| To Administration OH control A/c | 52,900 | | |
| | **11,35,300** | | **11,35,300** |

**Selling and Distribution Overhead Control A/c**

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Balance b/d | 6,250 | By Cost of Sales A/c | 82,000 |
| To Cost Ledger control A/c | 64,200 | | |
| To Material control A/c | 7,200 | | |
| To Balance c/d | 4,350 | | |
| | **82,000** | | **82,000** |

### Cost of Sales A/c

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Finished Goods Control A/C | 9,77,300 | By Costing profit & loss A/c | 10,74,100 |
| To Administration OH control A/c | 14,800 | | |
| To S & D OH control A/c | 82,000 | | |
| | **10,74,100** | | **10,74,100** |

### Costing Profit & Loss A/c

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Cost of sales A/c | 10,74,100 | By Cost ledger control A/c (Sales) | 14,43,000 |
| To Cost ledger control A/c (b.f.) (Profit for the period) | 3,68,900 | | |
| | **14,43,000** | | **14,43,000** |

### Cost Ledger Control A/c

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Costing profit and loss A/c | 14,43,000 | By Balance b/d | 3,13,150 |
| To Balance c/d | 3,22,300 | By Material control A/c | 4,80,100 |
| | | By Wages Control A/c | 2,14,300 |
| | | By Production OH control A/c | 2,50,650 |
| | | By Administration OH control A/c | 74,000 |
| | | By S & D OH control A/c | 64,200 |
| | | By Costing profit and loss A/c | 3,68,900 |
| | **17,65,300** | | **17,65,300** |

### Trial Balance as at 30th September

| Name of Account | Dr. | Cr. |
|---|---|---|
| Material Control A/c | 74,900 | - |
| Work-in-process Control A/c | 89,900 | - |
| Finished Goods Control A/c | 1,58,000 | - |
| Production Overheads Control A/c | 6,150 | - |
| Administration Overhead Control A/c | - | 2,300 |
| Selling and Distribution Overhead Control A/c | - | 4,350 |
| Cost Ledger Control A/c | - | 3,22,300 |
| **Total** | **3,28,950** | **3,28,950** |

**BQ 12**

***The following figures have been extracted from the Cost Ledger of a manufacturing unit:***

***Stores:***

| | |
|---|---|
| Opening balance | 15,000 |
| Purchases | 80,000 |
| Transfer from work-in-progress | 40,000 |
| Issues to work-in-progress | 80,000 |
| Issues to repairs and maintenance | 10,000 |
| Sold as special case at cost | 5,000 |
| Shortage in the year | 3,000 |

***Work-in-progress:***

| | |
|---|---|
| Opening inventory | 30,000 |
| Direct labour cost charged | 30,000 |
| Overhead cost charged | 1,20,000 |
| Closing balance | 20,000 |

***Entire output is sold at a profit of 10% on actual cost from work-in-progress.***

| | |
|---|---|
| Wages for the period | 35,000 |

| | |
|---|---|
| Overhead expenses | 1,25,000 |

***Ascertain the profit or loss as per financial account and cost accounts and reconcile them.***

## Answer

### Stores Ledger Control Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 15,000 | By WIP Control A/c | 80,000 |
| To Cost Ledger Control A/c (Purchases) | 80,000 | By Cost Ledger Control A/c (Materials sold at cost) | 5,000 |
| To Work in progress Control A/c (Return from WIP) | 40,000 | By Overhead Control A/c | 10,000 |
| | | By Overhead Control A/c (assumed normal) | 3,000 |
| | | By Balance c/d | 37,000 |
| | **1,35,000** | | **1,35,000** |

### Wages Control Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Cost Ledger Control A/c | 35,000 | By WIP Control A/c | 30,000 |
| | | By Overhead Control A/c | 5,000 |
| | **35,000** | | **35,000** |

### Overhead Control Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Cost Ledger Control A/c | 1,25,000 | By WIP Control A/c | 1,20,000 |
| To Store Ledger Control A/c | 10,000 | By Balance c/d (under recovery carried forward) | 23,000 |
| To Store Ledger Control A/c | 3,000 | | |
| To Wages Control A/c | 5,000 | | |
| | **1,43,000** | | **1,43,000** |

### Work in Progress Control Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 30,000 | By Stores Control A/c | 40,000 |
| To Stores Ledger Control A/c | 80,000 | By Costing Profit and Loss A/c (i.e., cost of sales) | 2,00,000 |
| To Wages Control A/c | 30,000 | | |
| To Overhead Control A/c | 1,20,000 | By Balance c/d | 20,000 |
| | **2,60,000** | | **2,60,000** |

### Costing Profit & Loss Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To WIP Control A/c | 2,00,000 | By Cost Ledger Control A/c (Sales: 2,00,000 + 10%) | 2,20,000 |
| To Profit | 20,000 | | |
| | **2,20,000** | | **2,20,000** |

### (Alternatively) Statement of Profit as per Costing Records

| Particulars | Amount |
|---|---|
| Direct materials cost (80,000 – 40,000) | 40,000 |
| Direct wages | 30,000 |
| Prime Cost | 70,000 |
| Production overheads | 1,20,000 |
| Add: Opening WIP | 30,000 |
| Less: Closing WIP | (20,000) |
| Cost of Finished Goods | 2,00,000 |
| Profit @10% of 2,00,000 | 20,000 |
| Sales | 2,20,000 |

***Profit & Loss Account***

| Particulars | | | Amount | Particulars | | | Amount |
|---|---|---|---|---|---|---|---|
| To Opening stock: | | | | By Sales | | | 2,20,000 |
| | Materials | 15,000 | | By Closing stock: | | | |
| | WIP | 30,000 | 45,000 | | Materials | 37,000 | |
| To Purchases net of item sold | | | 75,000 | | WIP | 20,000 | 57,000 |
| (80,000 – 5,000) | | | | By Net Loss | | | 3,000 |
| To Wages incurred | | | 35,000 | | | | |
| To Overheads incurred | | | 1,25,000 | | | | |
| | | | **2,80,000** | | | | **2,80,000** |

***Reconciliation statement***

| Particulars | ₹ |
|---|---|
| Profit as per Cost Accounts | 20,000 |
| Less: Overhead under recovered | (23,000) |
| Loss as per Financial Accounts | (3,000) |

## *BQ 13*

A company operates on historic job cost accounting system, which is not integrated with the financial accounts. At the beginning of a month, the opening balances in cost ledger were:

| Particulars | ₹(In lakhs) |
|---|---|
| Stores Ledger Control Account | 80 |
| Work-in-Process Control Account | 20 |
| Finished Goods Control Account | 430 |
| Building Construction Account | 10 |
| Cost Ledger Control Account | 540 |
| ***During the month, the following transaction took place:*** | |
| Materials: | |
| Purchased | 40 |
| Issued to production | 50 |
| Issued to factory maintenance | 6 |
| Issued to building construction | 4 |
| Wages: | |
| Gross wages paid | 150 |
| Indirect wages | 40 |
| For building construction | 10 |
| Works Overheads: | |
| Actual amount incurred | 160 |
| (excluding items shown above) | |
| Absorbed in building construction | 20 |
| Under absorbed | 8 |
| Royalty paid (related to production) | 5 |
| Selling, distribution and administration overheads | 25 |
| Sales | 450 |

At the end of the month, the stock of raw material and work-in-Process was ₹55 lakhs and ₹25 lakhs respectively. The loss arising in the raw material accounts is treated as factory overheads. The building under construction was completed during the month. Company's gross profit margin is 20% on sales.

***Prepare the relevant control accounts to record the above transactions in the cost ledger of the company.***

## *Answer*

***Stores Ledger Control A/c***

| Particulars | ₹(in lakhs) | Particulars | ₹(in lakhs) |
|---|---|---|---|
| To Balance b/d | 80 | By Work-in-process A/c | 50 |
| To Cost Ledger Control A/c | 40 | By Works OH Control A/c | 6 |
| | | By Building Construction A/c | 4 |
| | | By Works OH Control A/c (b.f.; loss) | 5 |
| | | By Balance c/d | 55 |
| | **120** | | **120** |

### Wages Control A/c

| Particulars | ₹(in lakhs) | Particulars | ₹(in lakhs) |
|---|---|---|---|
| To Cost Ledger Control A/c | 150 | By Work-in-process A/c (b.f.) | 100 |
| | | By Works OH Control A/c | 40 |
| | | By Building Construction A/c | 10 |
| | **150** | | **150** |

### Royalty A/c

| Particulars | ₹(in lakhs) | Particulars | ₹(in lakhs) |
|---|---|---|---|
| To Cost Ledger Control A/c | 5 | By Work-in-process A/c | 5 |
| | **5** | | **5** |

### Works Overhead Control A/c

| Particulars | ₹(in lakhs) | Particulars | ₹(in lakhs) |
|---|---|---|---|
| To Cost Ledger Control A/c | 160 | By Work-in-process A/c (b.f.) | 183 |
| To Stores Ledger Control A/c | 6 | By Building Construction A/c | 20 |
| To Stores Ledger Control A/c | 5 | By Costing P & L A/c | 8 |
| To Wages Control A/c | 40 | (under absorption) | |
| | **211** | | **211** |

### Work-in-Process Control A/c

| Particulars | ₹(in lakhs) | Particulars | ₹(in lakhs) |
|---|---|---|---|
| To Balance b/d | 20 | By Finished Goods Control A/c (b.f.) | 333 |
| To Works OH Control A/c | 183 | By Balance c/d | 25 |
| To Wages Control A/c | 100 | | |
| To Stores Ledger Control A/c | 50 | | |
| To Royalty A/c | 5 | | |
| | **358** | | **358** |

### Finished Goods Control A/c

| Particulars | ₹(in lakhs) | Particulars | ₹(in lakhs) |
|---|---|---|---|
| To Balance b/d | 430 | By Cost of Sales A/c | 360 |
| To Work-in-Progress Control A/c | 333 | (80% of ₹450/Gross Profit 20%) | |
| | | By Balance c/d (b.f) | 403 |
| | **763** | | **763** |

### Selling, Distribution and Administration Overhead A/c

| Particulars | ₹(in lakhs) | Particulars | ₹(in lakhs) |
|---|---|---|---|
| To Cost Ledger Control A/c | 25 | By Cost of Sales A/c | 25 |
| | **25** | | **25** |

### Cost of Sales A/c

| Particulars | ₹(in lakhs) | Particulars | ₹(in lakhs) |
|---|---|---|---|
| To Finished Goods Control A/c | 360 | By Costing P & L A/c | 385 |
| To Selling, Distribution and Administration OH A/c | 25 | | |
| | **385** | | **385** |

### Costing P & L A/c

| Particulars | ₹(in lakhs) | Particulars | ₹(in lakhs) |
|---|---|---|---|
| To Cost of Sales A/c | 385 | By Cost Ledger Control A/c (Sales) | 450 |
| To Works OH Control A/c | 8 | | |
| To Cost Ledger Control A/c | 57 | | |
| (Profit/b.f.) | **450** | | **450** |

### Building Construction A/c

| Particulars | ₹(in lakhs) | Particulars | ₹(in lakhs) |
|---|---|---|---|
| To Balance b/d | 10 | By Cost Ledger Control A/c | 44 |
| To Stores Ledger Control A/c | 4 | | |
| To Wages Control A/c | 10 | | |
| To Works OH Control A/c | 20 | | |
| | **44** | | **44** |

### Cost Ledger Control A/c

| Particulars | ₹(in lakhs) | Particulars | ₹(in lakhs) |
|---|---|---|---|
| To Costing P & L A/c | 450 | By Balance b/d | 540 |
| To Building Construction A/c | 44 | By Stores Ledger Control A/c | 40 |
| To Balance c/d | 483 | By Wages Control A/c | 150 |
| | | By Works OH Control A/c | 160 |
| | | By Royalty A/c | 5 |
| | | By Selling, Distribution and Administration OH A/c | 25 |
| | | By Costing P & L A/c | 57 |
| | **977** | | **977** |

### Trial Balance

| Name of Account | Dr. | Cr. |
|---|---|---|
| Stores Ledger Control A/c | 55 | - |
| Work in progress Control A/c | 25 | - |
| Finished Goods Control A/c | 403 | - |
| Cost Ledger Control A/c | - | 483 |
| **Total** | **483** | **483** |

### BQ 14

The following figures are extracted from the Trial Balance of Go-getter Co. on 31st March:

| Name of Account | Dr. (₹) | Cr. (₹) |
|---|---|---|
| Inventories: | | |
| Finished Stock | 80,000 | - |
| Raw Materials | 1,40,000 | - |
| Work-in-Process | 2,00,000 | - |
| Office Appliances | 17,400 | - |
| Plant & Machinery | 4,60500 | - |
| Building | 2,00,000 | - |
| Sales | - | 7,68,000 |
| Sales Return and Rebates | 14,000 | - |
| Materials Purchased | 3,20,000 | - |
| Freight incurred on Materials | 16,000 | - |
| Purchase Returns | - | 4,800 |
| Direct employee cost | 1,60,000 | - |
| Indirect employee cost | 18,000 | - |
| Factory Supervision | 10,000 | - |
| Repairs and Upkeep Factory | 14,000 | - |
| Heat, Light and Power | 65,000 | - |

| | | |
|---|---|---|
| Rates and Taxes | 6,300 | - |
| Miscellaneous Factory Expenses | 18,700 | - |
| Sales Commission | 33,600 | - |
| Sales Travelling | 11,000 | - |
| Sales Promotion | 22,500 | - |
| Distribution Department: Salaries and Expenses | 18,000 | - |
| Office Salaries and Expenses | 8,600 | - |
| Interest on Borrowed Funds | 2,000 | - |

***Further details are available as follows:***

***(a)*** Closing Inventories:

| | |
|---|---|
| Finished Goods | 1,15,000 |
| Raw Materials | 1,80,000 |
| Work-in-Process | 1,92,000 |

***(b)*** Accrued expenses on:

| | |
|---|---|
| Direct employee cost | 8,000 |
| Indirect employee cost | 1,200 |
| Interest on Borrowed Funds | 2,000 |

***(c)*** Depreciation to be provided on:

| | |
|---|---|
| Office Appliances | 5% |
| Plant and Machinery | 10% |
| Buildings | 4% |

***(d)*** Distribution of the following costs:

Heat, Light and Power to Factory, Office and Distribution in the ratio 8 : 1 : 1. Rates and Taxes two-thirds to Factory and one-third to Office. Depreciation on Buildings to Factory, Office and Selling in the ratio 8 : 1 : 1.

With the help of the above information, you are required to prepare a condensed Profit and Loss Statement of Go-getter Co. for the year ended 31st March along with supporting schedules of:

***(1)*** Cost of Sales.
***(2)*** Selling and Distribution Expenses.
***(3)*** Administration Expenses.

## *Answer*

### *Profit and Loss Statement of Go-getter Company for the year ended 31st March*

| *Particulars* | *(₹)* | *(₹)* |
|---|---|---|
| Gross Sales | 7,68,000 | |
| Less: Returns | (14,000) | 7,54,000 |
| Less: Cost of Sales [Refer to Schedule (1)] | | (7,14,020) |
| Net Operating Profit | | 39,980 |
| Less: Interest on borrowed funds | | (4,000) |
| ***Net Profit*** | | ***35,980*** |

### *(1) Schedule of Cost of Sales*

| *Particulars* | *(₹)* | *(₹)* |
|---|---|---|
| Materials consumed in Production | | |
| Raw Material (Inventory opening balance) | 1,40,000 | |
| Add: Material Purchased | 3,20,000 | |
| Add: Freight on Material | 16,000 | |
| Less: Purchase Returns | (4,800) | |
| Less: Closing Raw Material Inventory | (1,80,000) | 2,91,200 |
| Direct employee cost (₹1,60,000 + ₹8,000) | | 1,68,000 |
| Prime Cost | | 4,59,200 |
| Factory Overheads: | | |
| Indirect employee cost (₹18,000 + ₹1,200) | 19,200 | |

| | | |
|---|---|---|
| Factory Supervision | 10,000 | |
| Repairs and Factory Upkeep | 14,000 | |
| Heat, Light and Power (₹65,000 × 8/10) | 52,000 | |
| Rates and Taxes (₹6,300 × 2/3) | 4,200 | |
| Miscellaneous Factory Expenses | 18,700 | |
| Depreciation of Plant (10% of ₹4,60,500) | 46,050 | |
| Depreciation of Buildings (4% of ₹2,00,000 × 8/10) | 6,400 | 1,70,550 |
| Add: Opening Work-in-Process inventory | | 2,00,000 |
| Less: Closing Work-in-Process inventory | | (1,92,000) |
| Cost of Production | | 6,37,750 |
| Add: Opening Finished Goods inventory | | 80,000 |
| Less: Closing Finished Goods inventory | | (1,15,000) |
| Cost of Goods Sold | | 6,02,750 |
| Add: Administration Expenses [See Schedule (3)] | | 18,870 |
| Add: Selling and Distribution Expenses [See Schedule (2)] | | 92,400 |
| ***Cost of Sales*** | | ***7,14,020*** |

### *(2) Schedule of Selling and Distribution Expenses*

| ***Particulars*** | ***(₹)*** |
|---|---|
| Sales Commission | 33,600 |
| Sales Travelling | 11,000 |
| Sales Promotion | 22,500 |
| Distribution Department: Salaries and Expenses | 18,000 |
| Heat, Light and Power | 6,500 |
| Depreciation of Buildings | 800 |
| ***Selling and Distribution Expenses*** | ***92,400*** |

### *(3) Schedule of Administration Expenses*

| ***Particulars*** | ***(₹)*** |
|---|---|
| Office Salaries and Expenses | 8,600 |
| Depreciation of Office Appliances | 870 |
| Depreciation of Buildings | 800 |
| Heat, Light and Power | 6,500 |
| Rates and Taxes | 2,100 |
| ***Administration Expenses*** | ***18,870*** |

# PAST YEAR QUESTIONS

## PYQ 1

The following balances were extracted from a company's ledger as on 31st December 1997:

| Name of Account | Dr. | Cr. |
|---|---|---|
| Raw materials control A/c | 48,836 | - |
| Work in progress Control A/c | 14,745 | - |
| Finished Stock Ledger Control A/c | 21,980 | - |
| Cost ledger control A/c | - | 85,561 |
| ***Total*** | ***85,561*** | ***85,561*** |

***Further transactions took place during the following quarter as follows:***

| | |
|---|---|
| Direct wages | 18,370 |
| Factory overhead allocated to WIP | 11,786 |
| Goods Finished at cost | 36,834 |
| Raw materials purchased | 22,422 |
| Cost of goods sold | 42,000 |
| Raw materials issued to production | 17,000 |
| Raw materials credited by suppliers | 1,000 |
| Inventory audit raw material losses | 1,300 |
| WIP rejected (with no scrap value) | 1,800 |
| Customer's return (at cost) of finished goods | 3,000 |

***Prepare all the ledger accounts in cost ledger.***

***[(10 Marks) Nov 1998]***

## Answer

***Raw Material Control A/c***

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Bal b/d | 48,836 | By WIP A/c | 17,000 |
| To Cost Ledger Control A/c | 22,422 | By Cost Ledger Control A/c | 1,000 |
| | | By Cost Ledger Control A/c (Loss) | 1,300 |
| | | By Bal c/d | 51,958 |
| | ***71,258*** | | ***71,258*** |

***Wages Control A/c***

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Cost Ledger Control A/c | 18,370 | By WIP A/c | 18,370 |
| | ***18,370*** | | ***18,370*** |

***Factory Overheads Control A/c***

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Cost Ledger Control A/c | 11,786 | By WIP A/c | 11,786 |
| | ***11,786*** | | ***11,786*** |

***Work-in-Process Control A/c***

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Bal b/d | 14,745 | By Finished Stock Control A/c | 36,834 |
| To Factory OH Control A/c | 11,786 | By Cost Ledger Control A/c | |
| To Wages Control A/c | 18,370 | (Rejected) | 1,800 |
| To Raw Material Control A/c | 17,000 | By Bal c/d | 23,267 |
| | ***61,901*** | | ***61,901*** |

**Finished Stock Control A/c**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Bal b/d | 21,980 | By Cost of Sales | 42,000 |
| To Work-in-Progress Control A/c | 36,834 | By Bal c/d | 19,814 |
| To Cost of Sales (Return) | 3,000 | | |
| | **61,814** | | **61,814** |

**Cost of Sales A/c**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Finished Goods Control A/c | 42,000 | By Finished Goods Control A/c | 3,000 |
| | | By Bal c/d | 39,000 |
| | **42,000** | | **42,000** |

**Cost Ledger Control A/c**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Raw Material Control A/c (Returns) | 1,000 | By Bal b/d | 85,561 |
| | | By Raw Material Control A/c | 22,422 |
| To Raw Materials Control A/c (Loss) | 1,300 | By Wages Control A/c | 18,370 |
| To WIP Control A/c (Rejected) | 1,800 | By Factory OH Control A/c | 11,786 |
| To Bal c/d | 1,34,039 | | |
| | **1,38,139** | | **1,38,139** |

**PYQ 2**

**Pass journal entries in the cost books (non-integrated system) for the following transactions:**

| | | | |
|---|---|---|---|
| *(i)* | Issue of Materials | : | Direct ₹5,50,000, Indirect ₹1,50,000 |
| *(ii)* | Allocation of wages | : | Direct ₹2,00,000, Indirect ₹40,000 |
| *(iii)* | Under/over absorbed overheads | : | Factory (over) ₹20,000<br>Administration (under) ₹10,000 |

**[(8 Marks) Nov 2007]**

**Answer**

**Journal Entries**

| S. No. | Entries | | Dr. | Cr. |
|---|---|---|---|---|
| *(i)* | Work-in-progress Ledger Control A/c | Dr. | 5,50,000 | - |
| | Factory Overhead Control A/c | Dr. | 1,50,000 | - |
| | To Stock Ledger Control Account | | - | 7,50,000 |
| | (Being issue of materials) | | | |
| *(ii)* | Work-in-progress Ledger Control A/c | Dr. | 2,00,000 | - |
| | Factory Overhead Control A/c | Dr. | 40,000 | - |
| | To Wages Control A/c | | - | 2,40,000 |
| | (Being Allocation of wages) | | | |
| *(iii) a* | Factory Overhead Control A/c | Dr. | 20,000 | - |
| | To Costing P/L A/c | | - | 20,000 |
| | (Being Factory overhead over adjusted) | | | |
| *(iv) b* | Costing P/L A/c | Dr. | 10,000 | - |
| | To Administrative O/H control A/c | | - | 10,000 |
| | ( Being Administration O/H under absorbed) | | | |

**PYQ 3**

BPR Limited keeps books on integrated accounting system. The following balances appear in the books as on April 1, 2002:

| Name of Account | Dr. | Cr. |
|---|---|---|
| Stores Ledger control A/c | 40,950 | - |
| Work in progress Control A/c | 38,675 | - |

| | | |
|---|---|---|
| Finished Stock Ledger Control A/c | 52,325 | - |
| Bank A/c | - | 22,750 |
| Creditors A/c | - | 18,200 |
| Fixed Assets A/c | 1,47,875 | - |
| Debtors A/c | 27,300 | - |
| Share Capital A/c | - | 1,82,000 |
| Provision for Depreciation A/c | - | 11,375 |
| Provision for Doubtful Debts A/c | - | 3,725 |
| Production Overheads Outstanding A/c | - | 6,250 |
| Prepaid Administration Overheads A/c | 9,975 | - |
| Profit & Loss A/c | - | 72,800 |
| ***Total*** | ***3,17,100*** | ***3,17,100*** |

***The transactions for the year ended March 31, 2003 were as given below:***

| | | |
|---|---|---|
| Direct Wages | 1,97,925 | |
| Indirect Wages | 11,375 | 2,09,300 |
| Purchase of materials (on credit) | | 2,27,500 |
| Materials issued to production | | 2,50,250 |
| Materials issued for repairs | | 4,550 |
| Goods finished during the year (at cost) | | 4,89,125 |
| Credit Sales | | 6,82,500 |
| Cost of Goods sold | | 5,00,500 |
| Production overheads absorbed | | 1,09,200 |
| Production overheads paid during the year | | 91,000 |
| Production overheads outstanding at the end of year | | 7,775 |
| Administration overheads paid during the year | | 27,300 |
| Selling overheads incurred | | 31,850 |
| Payment to Creditors | | 2,29,775 |
| Payment received from Debtors | | 6,59,750 |
| Depreciation of Machinery | | 14,789 |
| Administration overheads outstanding at the end of year | | 2,225 |
| Provision for doubtful debts at the end of the year | | 4,590 |

***Write up accounts in the integrated ledger of BPR Limited and prepare a Trial Balance.***

***[(10 Marks) Nov 2003]***

## *Answer*

### *Stores Ledger Control A/c*

| ***Particulars*** | ***Amount*** | ***Particulars*** | ***Amount*** |
|---|---|---|---|
| To Bal b/d | 40,950 | By WIP Ledger Control A/c | 2,50,250 |
| To Creditors | 2,27,500 | By Production Overhead Control A/c | 4,550 |
| | | By Bal c/d | 13,650 |
| | ***2,68,450*** | | ***2,68,450*** |

### *Wages Control A/c*

| ***Particulars*** | ***Amount*** | ***Particulars*** | ***Amount*** |
|---|---|---|---|
| To Bank A/c (19,7,925 + 11,375) | 2,09,300 | By WIP Ledger Control A/c | 1,97,925 |
| | | By Production Overhead Control A/c | 11,375 |
| | ***2,09,300*** | | ***2,09,300*** |

### *Production Overhead Control A/c*

| ***Particulars*** | ***Amount*** | ***Particulars*** | ***Amount*** |
|---|---|---|---|
| To Stores Ledger Control A/c | 4,550 | By WIP Ledger Control A/c | 1,09,200 |
| To Wages Control A/c | 11,375 | By Profit & Loss A/c | 14,039 |
| To Bank A/c (91,000 – 6,250) | 84,750 | (Under recovery) | |

| | | | |
|---|---|---|---|
| To Production OH outstanding | 7,775 | | |
| To Provision for depreciation | 14,789 | | |
| | ***1,23,239*** | | ***1,23,239*** |

### *Work-in-Progress Ledger Control A/c*

| *Particulars* | *Amount* | *Particulars* | *Amount* |
|---|---|---|---|
| To Bal b/d | 38,675 | By Finished Goods Control A/c | 4,89,125 |
| To Production Overhead Control A/c | 1,09,200 | By Bal c/d | 1,06,925 |
| To Wages Control A/c | 1,97,925 | | |
| To Stores Ledger Control A/c | 2,50,250 | | |
| | ***5,96,050*** | | ***5,96,050*** |

### *Administration Overheads Control A/c*

| *Particulars* | *Amount* | *Particulars* | *Amount* |
|---|---|---|---|
| To Prepaid Administration OH A/c | 9,975 | By Finished Goods Control A/c | 39,500 |
| To Bank A/c | 27,300 | | |
| To Admin OH outstanding A/c | 2,225 | | |
| | ***39,500*** | | ***39,500*** |

### *Finished Goods Control A/c*

| *Particulars* | *Amount* | *Particulars* | *Amount* |
|---|---|---|---|
| To Balance b/d | 52,325 | By Cost of Sales A/c | 5,00,500 |
| To WIP Ledger Control A/c | 4,89,125 | By Balance c/d | 80,450 |
| To Administration OH Control A/c | 39,500 | | |
| | ***5,80,950*** | | ***5,80,950*** |

### *Selling Overheads Control A/c*

| *Particulars* | *Amount* | *Particulars* | *Amount* |
|---|---|---|---|
| To Bank A/c | 31,850 | By Cost of Sales A/c | 31850 |
| | ***31,850*** | | ***31,850*** |

### *Cost of Sales A/c*

| *Particulars* | *Amount* | *Particulars* | *Amount* |
|---|---|---|---|
| To Finished Goods Control A/c | 5,00,500 | By Sales A/c | 5,32,350 |
| To Selling overhead A/c | 31,850 | | |
| | ***5,32,350*** | | ***5,32,350*** |

### *Sales A/c*

| *Particulars* | *Amount* | *Particulars* | *Amount* |
|---|---|---|---|
| To Cost of sales A/c | 5,32,350 | By Debtors A/c | 6,82,500 |
| To Profit & Loss A/c | 1,50,150 | | |
| | ***6,82,500*** | | ***6,82,500*** |

### *Production Overheads Outstanding A/c*

| *Particulars* | *Amount* | *Particulars* | *Amount* |
|---|---|---|---|
| To Bank A/c | 6,250 | By Balance b/d | 6,250 |
| To Balance c/d | 7,775 | By Production overhead A/c | 7,775 |
| | ***14,025*** | | ***14,025*** |

### *Prepaid Administration Overheads A/c*

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 9,975 | By Administration overhead A/c | 9,975 |
| | **9,975** | | **9,975** |

**Provision for Depreciation A/c**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance c/d | 26,164 | By Balance b/d | 11,375 |
| | | By Production overhead A/c | 14,789 |
| | **26,164** | | **26,164** |

**Provision for Doubtful Debts A/c**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance c/d | 4,590 | By Balance b/d | 3,725 |
| | | By Profit & Loss A/c | 865 |
| | **4,590** | | **4,590** |

**Debtors A/c**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 27,300 | By Bank A/c | 6,59,750 |
| To Sales A/c | 6,82,500 | By Balance c/d | 50,050 |
| | **7,09,800** | | **7,09,800** |

**Profit & Loss A/c**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Provision for doubtful debts | 865 | By Balance b/d | 72,800 |
| To Production overhead | 14,039 | By Sales A/c | 1,50,150 |
| To Balance c/d | 2,08,046 | | |
| | **2,22,950** | | **2,22,950** |

**Creditors A/c**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Bank | 2,29,775 | By Balance b/d | 18,200 |
| To Balance c/d | 15,925 | By Stores Ledger Control A/c | 2,27,500 |
| | **2,45,700** | | **2,45,700** |

**Bank A/c**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Debtors A/c | 6,59,750 | By Balance b/d | 22,750 |
| | | By Direct wages | 1,97,925 |
| | | By Indirect wages | 11,375 |
| | | By Production overhead A/c (84,750 + 6,250) | 91,000 |
| | | By Administration overhead A/c | 27,300 |
| | | By Selling overhead A/c | 31,850 |
| | | By Creditors A/c | 2,29,775 |
| | | By Balance c/d | 47,775 |
| | **6,59,750** | | **6,59,750** |

**Trial Balance**
**(As on March 31st 2003)**

| Name of Account | Dr. | Cr. |
|---|---|---|
| Stores Ledger control A/c | 13,650 | - |
| Work in progress Control A/c | 1,06,925 | - |
| Finished Stock Ledger Control A/c | 80,450 | - |
| Bank A/c | 47,775 | - |

| | | |
|---|---|---|
| Creditors A/c | - | 15,925 |
| Fixed Assets A/c | 1,47,875 | - |
| Debtors A/c | 50,050 | - |
| Share Capital A/c | - | 1,82,000 |
| Provision for Depreciation A/c | - | 26,164 |
| Provision for Doubtful Debts A/c | - | 4,590 |
| Factory Overheads Outstanding A/c | - | 7,775 |
| Administration Overhead Outstanding A/c | - | 2,225 |
| Profit & Loss A/c | - | 2,08,046 |
| ***Total*** | ***4,46,725*** | ***4,46,725*** |

***PYQ 4***

***The following figures have been extracted from the cost records of a manufacturing unit:***

***Stores:***

| | |
|---|---|
| Opening balance | 32,000 |
| Purchases of materials | 1,58,000 |
| Transfer from work-in-progress | 80,000 |
| Issues to work-in-progress | 1,60,000 |
| Issues to repairs | 20,000 |
| Deficiencies found in stock-taking | 6,000 |

***Work-in-progress:***

| | |
|---|---|
| Opening balance | 60,000 |
| Direct wages applied | 65,000 |
| Overheads applied | 2,40,000 |
| Closing balance of WIP | 45,000 |

***Entire output is sold at a profit of 10% on actual cost from work-in-progress.***

| | |
|---|---|
| Wages incurred | 70,000 |
| Overhead incurred | 2,50,000 |

***Items not included in cost records:***

| | |
|---|---|
| Income from investment | 10,000 |
| Loss on sale of capital assets | 20,000 |

***Draw up Store Control account, Work-in-progress Control account, Costing Profit and Loss account, Profit and Loss account and Reconciliation statement.***

***[(13 Marks) May 2005]***

***Answer***

***Stores Ledger Control Account***

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 32,000 | By WIP Ledger Control A/c | 1,60,000 |
| To Cost Ledger Control A/c | 1,58,000 | By Work Overhead Control A/c | 20,000 |
| To Work in progress Control A/c | 80,000 | By Costing P/L A/c (assumed abnormal) | 6,000 |
| | | By Balance c/d | 84,000 |
| | ***2,70,000*** | | ***2,70,000*** |

***Work in Progress Ledger Control Account***

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 60,000 | By Stores Control A/c | 80,000 |
| To Stores Ledger Control A/c | 1,60,000 | By Costing Profit and Loss A/c (i.e., cost of sales) | 4,00,000 |
| To Direct Wages Control A/c | 65,000 | | |
| To Works Overhead Control A/c | 2,40,000 | By Balance c/d | 45,000 |
| | ***5,25,000*** | | ***5,25,000*** |

### Works Overhead Control Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Cost Ledger Control A/c | 2,50,000 | By WIP Ledger Control A/c | 2,40,000 |
| To Store Ledger Control A/c | 20,000 | By Costing Profit & Loss A/c | 35,000 |
| To Wages Control A/c | 5,000 | (under recovery) | |
| | **2,75,000** | | **2,75,000** |

### Costing Profit & Loss Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To WIP Control A/c | 4,00,000 | By Cost Ledger Control A/c | 4,40,000 |
| To Works Overhead Control A/c | 35,000 | (4,00,000 + 10%) | |
| To Stores Ledger Control A/c | 6,000 | By Loss | 1,000 |
| | **4,41,000** | | **4,41,000** |

**Recording of transaction in financial books:**

### Profit & Loss Account

| Particulars | | Amount | Particulars | | Amount |
|---|---|---|---|---|---|
| To Opening stock: | | | By Sales | | 4,40,000 |
| Stores | 32,000 | | By Closing stock: | | |
| WIP | 60,000 | 92,000 | Stores | 84,000 | |
| To Purchases | | 1,58,000 | WIP | 45,000 | 1,29,000 |
| To Wages incurred | | 70,000 | By Income from investment | | 10,000 |
| To Overheads incurred | | 2,50,000 | By Loss | | 11,000 |
| To Loss on sale of capital asset | | 20,000 | | | |
| | | **5,90,000** | | | **5,90,000** |

### Reconciliation statement

| Particulars | ₹ |
|---|---|
| Loss as per Cost Accounts | (1,000) |
| Add: Income from investment recorded in financial accounts | 10,000 |
| Less: Loss on sale of capital assets only | (20,000) |
| Loss as per Financial Accounts | (11,000) |

## PYQ 5

As of 31st March, 2008, the following balances existed in a firm's cost ledger, which is maintained separately on a double entry basis:

| Name of Account | Dr. | Cr. |
|---|---|---|
| Stores Ledger Control A/c | 3,00,000 | - |
| Work in progress Control A/c | 1,50,000 | - |
| Finished Stock Ledger Control A/c | 2,50,000 | - |
| Manufacturing Overhead Control A/c | - | 15,000 |
| Cost Ledger Control A/c | - | 6,85,000 |
| **Total** | **7,00,000** | **7,00,000** |

**During the next quarter, the following items arose:**

| | |
|---|---|
| Finished Product (at cost) | 2,25,000 |
| Manufacturing overhead incurred | 85,000 |
| Raw material purchased | 1,25,000 |
| Factory wages | 40,000 |
| Indirect labour | 20,000 |
| Cost of sales | 1,75,000 |
| Materials issued to production | 1,35,000 |

| | |
|---|---|
| Sales returned (at cost) | 9,000 |
| Materials returned to suppliers | 13,000 |
| Manufacturing overhead charged to production | 85,000 |

***You are required to prepare the Cost Ledger Control A/c, Stores Ledger Control A/c, Work-in-progress Control A/c, Finished Stock Ledger Control A/c, Manufacturing Overheads Control A/c, Wages Control A/c, Cost of Sales A/c and the Trial Balance at the end of the quarter.***

***[(15 Marks) May 2008]***

## Answer

### Stores Ledger Control Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 3,00,000 | By WIP Ledger Control A/c (Materials issued) | 1,35,000 |
| To Cost Ledger Control A/c (Materials purchased) | 1,25,000 | By Cost Ledger Control A/c (Materials returned to supplier) | 13,000 |
| | | By Balance c/d | 2,77,000 |
| | **4,25,000** | | **4,25,000** |

### Wages Control Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Cost Ledger Control A/c (40,000 + 20,000) | 60,000 | By WIP Ledger Control A/c (Direct wages) | 40,000 |
| | | By Manufacturing OH Control A/c (indirect labour) | 20,000 |
| | **60,000** | | **60,000** |

### Manufacturing Overhead Control Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Wages Control A/c (Indirect labour) | 20,000 | By Balance b/d | 15,000 |
| To Cost Ledger Control A/c (Overhead incurred) | 85,000 | By WIP Ledger Control A/c (OH charges to production) | 85,000 |
| | | By Balance c/d | 5,000 |
| | **1,05,000** | | **1,05,000** |

### Cost Ledger Control A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Stores Ledger Control A/c (Materials returned to suppliers) | 13,000 | By Bal b/d | 6,85,000 |
| To Bal c/d | 9,42,000 | By Stores Ledger Control A/c (Materials purchased) | 1,25,000 |
| | | By Manufacturing OH Control A/c (overhead incurred) | 85,000 |
| | | By Wages Control A/c (40,000 + 20,000) | 60,000 |
| | **9,55,000** | | **9,55,000** |

### Work in Progress Control Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 1,50,000 | By Finished Stock Control A/c (finished product at cost) | 2,25,000 |
| To Wages Control A/c (direct wages) | 40,000 | By Balance c/d | 1,85,000 |
| To Stores Ledger Control A/c (Materials issued) | 1,35,000 | | |
| To Manufacturing OH Control A/c | 85,000 | | |
| | **4,10,000** | | **4,10,000** |

### *Finished Stock Ledger Control Account*

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 2,50,000 | By Cost of Sales A/c | 1,75,000 |
| To WIP Ledger Control A/c (Finished product at cost) | 2,25,000 | By Balance c/d | 3,09,000 |
| To Cost of Sales A/c (Sales return at cost) | 9,000 | | |
| | ***4,84,000*** | | ***4,84,000*** |

### *Cost of Sales Account*

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Finished Stock Control A/c | 1,75,000 | By Finished Stock Control A/c | 9,000 |
| | | By Balance c/d | 1,66,000 |
| | ***1,75,000*** | | ***1,75,000*** |

### *Trial Balance*

| Name of Account | Dr. | Cr. |
|---|---|---|
| Stores Ledger Control A/c | 2,77,000 | - |
| Work in progress Ledger Control A/c | 1,85,000 | - |
| Finished Stock Ledger Control A/c | 3,09,000 | - |
| Manufacturing Overhead Control A/c | 5,000 | - |
| Cost of Sales A/c | 1,66,000 | - |
| Cost Ledger Control A/c | - | 9,42,000 |
| ***Total*** | ***9,42,000*** | ***9,42,000*** |

### *PYQ 6*

***You are given the following information of the cost department of a manufacturing company:***

***Stores:***

| | |
|---|---|
| Opening Balance | 12,60,000 |
| Purchases | 67,20,000 |
| Transfer from work-in-progress | 33,60,000 |
| Issue to work-in-progress | 67,20,000 |
| Issue to repairs and maintenance | 8,40,000 |
| Shortage found in stock taking | 2,52,000 |
| (Shortage in stock taking is treated as normal loss) | |

***Work-in-progress:***

| | |
|---|---|
| Opening Balance | 25,20,000 |
| Direct wages applied | 25,20,000 |
| Overhead applied | 90,08,000 |
| Closing Balance | 15,20,000 |

***Finished products: Entire output is sold at a profit of 12% on actual cost from work-in-progress.***
***Other information:***

| | |
|---|---|
| Wages incurred | 29,40,000 |
| Overhead incurred | 95,50,000 |
| Income from Investment | 4,00,000 |
| Loss on sale of fixed assets | 8,40,000 |

***You are required to prepare:***

***(i)*** Stores control account;
***(ii)*** Work-in-progress control account;
***(iii)*** Costing Profit and Loss account;
***(iv)*** Profit and Loss account and
***(v)*** Reconciliation statement

***[(12 marks) May 2011]***

## Answer

### Stores Ledger Control A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 12,60,000 | By WIP Ledger Control A/c | 67,20,000 |
| To Cost Ledger Control A/c | 67,20,000 | By Overhead Control A/c | 8,40,000 |
| To WIP Ledger Control A/c | 33,60,000 | By Overhead Control A/c | 2,52,000 |
| | | By balance c/d | 35,28,000 |
| | **1,13,40,000** | | **1,13,40,000** |

### WIP Ledger Control A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 25,20,000 | By Stores Ledger Control A/c | 33,60,000 |
| To Stores Ledger Control A/c | 67,20,000 | By Costing P & L A/c (b.f.) | 1,58,88,000 |
| To Wages Control A/c | 25,20,000 | By balance c/d | 15,20,000 |
| To Overhead Control A/c | 90,08,000 | | |
| | **2,07,68,000** | | **2,07,68,000** |

### Costing P & L A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To WIP Ledger Control A/c | 1,58,88,000 | By Cost Ledger Control A/c (Sales: 1,58,88,000 + 12%) | 1,77,94,560 |
| To Overhead Control A/c | 20,54,000 | By Cost Ledger Control A/c (Net Loss) | 1,47,440 |
| | **1,79,42,000** | | **1,79,42,000** |

### Overhead Control A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Cost Ledger Control A/c | 95,50,000 | By WIP Ledger Control A/c | 90,08,000 |
| To Stores Ledger Control A/c | 8,40,000 | By Costing P & L A/c | 20,54,000 |
| To Stores Ledger Control A/c | 2,52,000 | | |
| To Wages Control A/c | 4,20,000 | | |
| | **1,10,62,000** | | **1,10,62,000** |

### Reconciliation Statement between Costing Profit and Financial Profit

| | |
|---|---|
| Loss as per Cost records | 1,47,440 |
| Add: Loss on sale of Fixed Asset | 8,40,000 |
| Less: Income from Investments | 4,00,000 |
| Loss as per Financial records | **5,87,440** |

### Financial P & L A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Opening Stock: | | By Sales | 1,77,94,560 |
| Raw Material | 12,60,000 | By Closing Stock: | |
| WIP | 25,20,000 | Raw Material | 35,28,000 |
| To Purchased of Raw Materials | 67,20,000 | WIP | 15,20,000 |
| To Wages incurred | 29,40,000 | By Income from Investments | 4,00,000 |
| To Overhead incurred | 95,50,000 | By Net Loss | 5,87,440 |
| To Loss on Sale of Fixed Asset | 8,40,000 | | |
| | **2,38,30,000** | | **2,38,30,000** |

## PYQ 7

***The following information has been extracted from the cost records of a manufacturing company:***

***Stores:***

| | |
|---|---|
| Opening balance | 9,000 |

| | |
|---|---|
| Purchase | 48,000 |
| Transfer from WIP | 24,000 |
| Issue to work-in-process | 48,000 |
| Issue for repairs | 6,000 |
| Deficiency found in stock | 1,800 |

***Work-in-process:***

| | |
|---|---|
| Opening balance | 18,000 |
| Direct wages applied | 18,000 |
| Overhead charged | 72,000 |
| Closing balance | 12,000 |

***Finished Production: Entire production is sold at a profit of 10% on cost from Work-in-process.***

| | |
|---|---|
| Wages paid | 21,000 |
| Overhead incurred | 75,000 |

***Draw the Stores Ledger Control A/c, Work-in-progress Control A/c, Overheads Control A/c and Costing Profit and Loss A/c.***

***[(8 marks) Nov 2011/May 2017]***

## *Answer*

### *Stores Ledger Control A/c*

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 9,000 | By WIP Ledger Control A/c | 48,000 |
| To Cost Ledger Control A/c | 48,000 | By Overhead Control A/c | 6,000 |
| To WIP Ledger Control A/c | 24,000 | By Overhead Control A/c | 1,800 |
| | | (Deficiency assumed normal) | 25,200 |
| | | By Balance c/d | |
| | ***81,000*** | | ***81,000*** |

### *WIP Ledger Control A/c*

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Opening balance | 18,000 | By Stores Ledger Control A/c | 24,000 |
| To Stores Ledger Control A/c | 48,000 | By Costing Profit & Loss A/c | 1,20,000 |
| To Wages Control A/c | 18,000 | By Balance c/d | 12,000 |
| To Overhead Control A/c | 72,000 | | |
| | ***1,56,000*** | | ***1,56,000*** |

### *Overhead Control A/c*

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Cost Ledger Control A/c | 75,000 | By WIP Ledger Control A/c | 72,000 |
| To Stores Ledger Control A/c | 6,000 | By Costing P & L A/c | 13,800 |
| To Stores Ledger Control A/c | 1,800 | | |
| To Wages Control A/c | 3,000 | | |
| | ***85,800*** | | ***85,800*** |

### *Costing P/L A/c*

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To WIP Ledger Control A/c | 1,20,000 | By Cost Ledger Control A/c | 1,32,000 |
| To Overhead Control A/c | 13,800 | (1,20,000 + 10%) | |
| | | By Cost Ledger Control A/c | 1,800 |
| | | (Loss) | |
| | ***1,33,800*** | | ***1,33,800*** |

### *Wages Control A/c*

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Cost Ledger Control A/c | 21,000 | By WIP Ledger Control A/c | 18,000 |
| | | By Overhead Control A/c | 3,000 |
| | ***21,000*** | | ***21,000*** |

***Note: This question is solved on the basis of Non Integrated Method of accounting, alternatively student can solve this problem by using Integrated Method of accounting.***

### PYQ 8

***Journalise the following transactions assuming cost and financial accounts are integrated:***

| | | |
|---|---|---|
| *(i)* | Materials issued: | |
| | Direct | ₹3,25,000 |
| | Indirect | ₹1,15,000 |
| *(ii)* | Allocation of wages (25% indirect) | ₹6,50,000 |
| *(iii)* | Under/Over absorbed overheads: | |
| | Factory (Over) | ₹2,50,000 |
| | Administration (Under) | ₹1,75,000 |
| *(iv)* | Payment to Sundry Creditors | ₹1,50,000 |
| *(v)* | Collection from Sundry Debtors | ₹2,00,000 |

***[(5 Marks) Nov 2013]***

### Answer

***Journal Entries***

| S. No. | Entries | | Dr. | Cr. |
|---|---|---|---|---|
| *(i)* | Work-in-progress Ledger Control A/c | Dr. | 3,25,000 | - |
| | Factory Overhead Control A/c | Dr. | 1,15,000 | - |
| | To Stores Ledger Control A/c | | - | 4,40,000 |
| | (Being issue of direct and indirect materials) | | | |
| *(ii)* | Work-in-progress Ledger Control A/c | Dr. | 4,87,500 | - |
| | Factory Overhead Control A/c | Dr. | 1,62,500 | - |
| | To Wages Control A/c | | - | 6,50,000 |
| | (Being allocation of direct and indirect wages) | | | |
| *(iii)* | Factory Overhead Control A/c | Dr. | 2,50,000 | - |
| | To Costing P/L A/c | | - | 2,50,000 |
| | (Being factory overhead over absorbed) | | | |
| | Costing P/L A/c | Dr. | 1,75,000 | - |
| | To Administration Overhead Control A/c | | - | 1,75,000 |
| | (Being administration overhead under absorbed) | | | |
| *(iv)* | Sundry Creditors | Dr. | 1,50,000 | - |
| | To Cash A/c | | - | 1,50,000 |
| | ( Being payments made to sundry creditors) | | | |
| *(v)* | Cash A/c | Dr. | 2,00,000 | - |
| | To Sundry Debtors | | - | 2,00,000 |
| | ( Being collection received from sundry debtors) | | | |

### PYQ 9

***Following information has been extracted from the cost records of XYZ Pvt. Ltd:***

***Stores:***

| | |
|---|---|
| Opening balance | 54,000 |
| Purchase | 2,88,000 |
| Transfer from WIP | 1,44,000 |
| Issue to work-in-process | 2,88,000 |
| Issue for repairs | 36,000 |
| Deficiency found in stock | 10,800 |

**Work-in-process:**

| | |
|---|---|
| Opening balance | 1,08,000 |
| Direct wages applied | 1,08,000 |
| Overhead charged | 4,32,000 |
| Closing balance | 72,000 |

**Finished Production:**

***Entire production is sold at a profit of 15% on cost from Work-in-process.***

| | |
|---|---|
| Wages paid | 1,26,000 |
| Overhead incurred | 4,50,000 |

***Draw the Stores Ledger Control A/c, Work-in-progress Control A/c, Overheads Control A/c and Costing Profit and Loss A/c.***

***[(8 marks) Nov 2014]***

## Answer

### Stores Ledger Control A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 54,000 | By WIP Ledger Control A/c | 2,88,000 |
| To Cost Ledger Control A/c | 2,88,000 | By Overhead Control A/c | 36,000 |
| To WIP Ledger Control A/c | 1,44,000 | By Overhead Control A/c | 10,800 |
| | | (Deficiency assumed normal) | 1,51,200 |
| | | By Balance c/d | |
| | ***4,86,000*** | | ***4,86,000*** |

### WIP Ledger Control A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Opening balance | 1,08,000 | By Stores Ledger Control A/c | 1,44,000 |
| To Stores Ledger Control A/c | 2,88,000 | By Costing Profit & Loss A/c | 7,20,000 |
| To Wages Control A/c | 1,08,000 | By Balance c/d | 72,000 |
| To Overhead Control A/c | 4,32,000 | | |
| | ***9,36,000*** | | ***9,36,000*** |

### Overhead Control A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Cost Ledger Control A/c | 4,50,000 | By WIP Ledger Control A/c | 4,32,000 |
| To Stores Ledger Control A/c | 36,000 | By Costing P & L A/c | 82,800 |
| To Stores Ledger Control A/c | 10,800 | | |
| To Wages Control A/c | 18,000 | | |
| | ***5,14,800*** | | ***5,14,800*** |

### Costing P/L A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To WIP Ledger Control A/c | 7,20,000 | By Cost Ledger Control A/c | 8,28,000 |
| To Overhead Control A/c | 82,800 | (Sales: 7,20,000 + 15%) | |
| To Cost Ledger Control A/c | 25,200 | | |
| (Profit) | | | |
| | ***8,28,000*** | | ***8,28,000*** |

### Wages Control A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Cost Ledger Control A/c | 1,26,000 | By WIP Ledger Control A/c | 1,08,000 |
| | | By Overhead Control A/c | 18,000 |
| | ***1,26,000*** | | ***1,26,000*** |

***PYQ 10***

***The following information is available from a company's records for March, 2016:***

| | | |
|---|---|---|
| *(a)* | Opening balance of Creditors Account | ₹25,000 |
| *(b)* | Closing balance of Creditors Account | ₹40,000 |
| *(c)* | Payment made to Creditors | ₹5,80,000 |
| *(d)* | Opening balance of Stores Ledger Control Account | ₹40,000 |
| *(e)* | Closing balance of Stores Ledger Control Account | ₹65,000 |
| *(f)* | Wages paid (for 8,000 hours) 20% relate to indirect workers | ₹4,00,000 |
| *(g)* | Various indirect expenses incurred | ₹60,000 |
| *(h)* | Opening balance of WIP Control Account | ₹50,000 |
| *(i)* | Inventory of WIP at the end includes: | |
| | Material worth | ₹35,000 |
| | Labour hours booked | 400 hours |
| *(j)* | Budgeted: | |
| | Overhead cost | ₹20,80,000 |
| | Labour hours | 1,04,000 |
| *(h)* | Factory overhead is charged to production at budgeted rate based on direct labour hours. | |

***You are required to prepare Creditors A/c, Stores Ledger Control A/c, WIP Control A/c, Wages Control A/c and Factory Overhead Control A/c.***

***[(8 marks) May 2016]***

## *Answer*

### *Creditors A/c*

| *Particulars* | *₹* | *Particulars* | *₹* |
|---|---|---|---|
| To Cash or Bank A/c | 5,80,000 | By Balance b/d | 25,000 |
| To Balance c/d | 40,000 | By Stores Ledger Control A/c (Balancing figure) | 5,95,000 |
| | ***6,20,000*** | | ***6,20,000*** |

### *Stores Ledger Control A/c*

| *Particulars* | *₹* | *Particulars* | *₹* |
|---|---|---|---|
| To Balance b/d | 40,000 | By Work-in-progress Control A/c (Balancing figure) | 5,70,000 |
| To Creditors A/c (Purchase: figure from creditor A/c) | 5,95,000 | By Balance b/d | 65,000 |
| | ***6,35,000*** | | ***6,35,000*** |

### *Work-in-progress Ledger Control A/c*

| *Particulars* | *₹* | *Particulars* | *₹* |
|---|---|---|---|
| To Balance b/d | 50,000 | By Finished Goods Control A/c (b.f.) | 10,05,000 |
| To Stores Ledger Control A/c | 5,70,000 | By Balance c/d: | |
| To Wages Control A/c | 3,20,000 | Material ₹35,000 | |
| To Factory Overhead Control A/c | 1,28,000 | Labour (400 hrs × ₹50) ₹20,000 | |
| | | Overheads (400 hrs × ₹20) ₹8,000 | 63,000 |
| | ***10,68,000*** | | ***10,68,000*** |

### *Wages Control A/c*

| *Particulars* | *₹* | *Particulars* | *₹* |
|---|---|---|---|
| To Bank A/c | 4,00,000 | By WIP Ledger Control A/c (8,000 hours × 80% × 50) | 3,20,000 |
| | | By Factory Overhead Control A/c (8,000 hours × 20% × 50) | 80,000 |
| | ***4,00,000*** | | ***4,00,000*** |

**Factory Overhead Control A/c**

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Bank A/c | 60,000 | By WIP Ledger Control A/c (6,400 hrs × ₹20) | 1,28,000 |
| To Wages Control A/c | 80,000 | By Costing P/L A/c (Under-absorbed Overheads) | 12,000 |
| | **1,40,000** | | **1,40,000** |

**Working notes:**

**1.** Direct Labour Hour Rate = Labour Cost ÷ Labour Hour
= ₹4,00,000 ÷ 8,000 hours
= ***₹50 per hour***

**2.** Factory Overhead Rate = Budgeted Factory Overheads ÷ Budgeted Labour Hours
= ₹20,80,000 ÷ 1,04,000
= ***₹20 per hour***

## PYQ 11

The following balances were extracted from a company's ledger as on 30th June 2018:

| Name of Account | Dr. | Cr. |
|---|---|---|
| Raw materials control A/c | 2,82,450 | - |
| Work in progress control A/c | 2,38,300 | - |
| Finished stock control A/c | 3,92,500 | - |
| General ledger adjustment A/c | - | 9,13,250 |
| **Total** | **9,13,250** | **9,13,250** |

***The following transactions took place during the quarter ended 30th September, 2018:***

| | |
|---|---|
| Factory overhead - allocated to WIP | 1,36,350 |
| Goods Finished at - cost | 13,76,200 |
| Raw materials purchased | 12,43,810 |
| Direct wages - allocated to WIP | 2,56,800 |
| Cost of goods sold | 14,56,500 |
| Raw materials - issued to production | 13,60,430 |
| Raw materials - credited by suppliers | 27,200 |
| Raw material losses – inventory audit | 6,000 |
| WIP rejected (with no scrap value) | 12,300 |
| Customer's return (at cost) of finished goods | 45,900 |

***You are required to prepare:***

***(1)*** Raw material control A/c
***(2)*** Work-in-progress control A/c
***(3)*** Finished stock control A/c
***(4)*** General ledger adjustment A/c

***[(10 Marks) Nov 2018]***

## Answer

**Raw Material Control A/c**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 2,82,450 | By WIP A/c | 13,60,430 |
| To General Ledger Adjustment A/c | 12,43,810 | By General Ledger Adjustment A/c | 27,200 |
| | | By General Ledger Adjustment A/c (Loss) | 6,000 |
| | | By Balance c/d (Bal. figure) | 1,32,630 |
| | **15,26,260** | | **15,26,260** |

### Work-in-Process Control A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 2,38,300 | By Finished Stock Control A/c | 13,76,200 |
| To Raw Material Control A/c | 13,60,430 | By General Ledger Adjustment A/c (Rejected) | 12,300 |
| To Wages Control A/c | 2,56,800 | | |
| To Factory OH Control A/c | 1,36,350 | By Balance c/d (Bal. figure) | 6,03,380 |
| | ***19,91,880*** | | ***19,91,880*** |

### Finished Stock Control A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 3,92,500 | By Cost of Sales | 14,56,500 |
| To Work-in-Progress Control A/c | 13,76,200 | By Balance c/d (bal. figure) | 3,58,100 |
| To Cost of Sales (Return) | 45,900 | | |
| | ***18,14,600*** | | ***18,14,600*** |

### General Ledger Adjustment A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Raw Material Control A/c (Returns) | 27,200 | By Balance b/d | 9,13,250 |
| | | By Raw Material Control A/c | 12,43,810 |
| To Raw Materials Control A/c (Loss) | 6,000 | By Wages Control A/c | 2,56,800 |
| To WIP Control A/c (Rejected) | 12,300 | By Factory OH Control A/c | 1,36,350 |
| To Balance c/d | 25,04,710 | | |
| | ***25,50,210*** | | ***25,50,210*** |

## PYQ 12

***Journalise the following transactions in the cost books under non- integrated system of accounting:***

| | | |
|---|---|---|
| ***(a)*** | Credit Purchase of Material | ₹27,000 |
| ***(b)*** | Manufacturing overheads charged to production | ₹6,000 |
| ***(c)*** | Selling and Distribution overheads recovered from Sales | ₹4,000 |
| ***(d)*** | Indirect wages incurred | ₹8,000 |
| ***(e)*** | Material returned from production to stores | ₹9,000 |

***[(5 Marks) Nov 2019]***

## Answer

### Journal Entries

| S. No. | Entries | Dr. | Cr. |
|---|---|---|---|
| ***(a)*** | Store Ledger Control A/c Dr. | 27,000 | - |
| | To Cost Ledger Control A/c | - | 27,000 |
| ***(b)*** | Work-in-progress Ledger Control A/c Dr. | 6,000 | - |
| | To Manufacturing Overhead Control A/c | - | 6,000 |
| ***(c)*** | Cost of Sales A/c Dr. | 4,000 | - |
| | To Selling & Distribution Overhead Control A/c | - | 4,000 |
| ***(d)*** | Wages Control A/c Dr. | 8,000 | - |
| | To Cost Ledger Control A/c | - | 8,000 |
| ***(e)*** | Store Ledger Control A/c Dr. | 9,000 | - |
| | To Work-in-progress Ledger Control A/c | - | 9,000 |

## PYQ 13

***Journalize the following transactions assuming the cost and financial accounts are integrated:***

| Particulars | (in ₹) |
|---|---|
| Direct Materials issued to production | 5,88,000 |
| Allocation of Wages (Indirect) | 7,50,000 |
| Factory Overheads (Over absorbed) | 2,25,000 |

| | |
|---|---|
| Administrative Overheads (Under absorbed) | 1,55,000 |
| Deficiency found in stock of Raw material (Normal) | 2,00,000 |

**[(5 Marks) May 2022]**

## Answer

### Journal Entries

| S. No. | Entries | Dr. | Cr. |
|---|---|---|---|
| (a) | Work-in-progress Ledger Control A/c Dr.<br>To Store Ledger Control A/c<br>(Being issue of direct materials to production) | 5,88,000<br>- | -<br>5,88,000 |
| (b) | Factory Overhead Control A/c Dr.<br>To Wages Control A/c<br>(Being allocation of indirect wages) | 7,50,000<br>- | -<br>7,50,000 |
| (c) | Factory Overhead Control A/c Dr.<br>To Costing Profit & Loss A/c<br>(Being transfer of over absorption of factory overhead) | 2,25,000<br>- | -<br>2,25,000 |
| (d) | Costing Profit & Loss A/c Dr.<br>To Administration Overhead Control A/c<br>(Being transfer of under absorption of administration overhead) | 1,55,000<br>- | -<br>1,55,000 |
| (e) | Factory Overhead Control A/c Dr.<br>To Store Ledger Control A/c<br>(Being transfer of deficiency in stock of raw material) | 2,00,000<br>- | -<br>2,00,000 |

# SUGGESTED REVISION

| Ques. No. | Observations or KEY Points (Note down during revisions) | Page No. of Practical Register | 1st & 2nd Revision | 3rd, 4th & 5th Revision | Revision during Exams |
|---|---|---|---|---|---|
| BQ (Book Questions covering Study Module of ICAI, PM, RTP's, MTP's and Important Questions) | | | | | |
| 1 | | | Y | - | - |
| 2 | | | Y | Y | Y |
| 3 | | | Y | Y | Y |
| 4 | | | Y | Y | Y |
| 5 | | | Y | Y | - |
| 6 | | | Y | Y | - |
| 7 | | | Y | - | - |
| 8 | | | Y | Y | Y |
| 9 | | | Y | Y | Y |
| 10 | | | Y | Y | Y |
| 11 | | | Y | Y | - |
| 12 | | | Y | Y | Y |
| 13 | | | Y | Y | Y |
| 14 | | | Y | Y | Y |
| PYQ (Past Year Questions) | | | | | |
| 1 | | | Y | Y | - |
| 2 | | | Y | - | - |
| 3 | | | Y | Y | Y |
| 4 | | | Y | - | - |
| 5 | | | Y | Y | - |
| 6 | | | Y | Y | Y |
| 7 | | | Y | - | - |
| 8 | | | Y | - | - |
| 9 | | | Y | - | - |
| 10 | | | Y | Y | Y |
| 11 | | | Y | - | - |
| 12 | | | Y | - | - |
| 13 | | | Y | - | - |

# *CHAPTER - 15*

# *RECONCILIATION*

***LEARNING OBJECTIVE***

***When you have finished studying this chapter, you should be able to***

- ***Understand the reasons of difference in profit between financial accounts and cost accounts.***
- ***Understand the concept of reconciliation statement.***
- ***Understand the method of preparation of reconciliation statement.***
- ***Understand the concept of memorandum reconciliation account.***
- ***Understand the method of preparation of memorandum reconciliation account.***
- ***Understand the advantages, disadvantages and need of reconciliation statement.***
- ***Understand the method of preparation of accounts under cost books with the help of financial accounts and reconciliation statement.***

### *BQ 1*

During the year ended 31st March, 2023, the profit of a company stood at ₹36,450 as per financial records. The cost books however showed a profit of ₹51,950 for the same period.

***Prepare a statement reconciling the profit as per cost records with the profit as per financial records.***

| | | |
|---|---|---|
| ***(a)*** | Opening stock overstated in cost accounts | 3,500 |
| ***(b)*** | Closing stock understated in cost accounts | 4,600 |
| ***(c)*** | Factory overheads under recovered in cost accounts | 2,500 |
| ***(d)*** | Administration expenses over recovered in cost accounts | 750 |
| ***(e)*** | Selling and distribution expenses under recovered in cost accounts | 1,650 |
| ***(f)*** | Depreciation over recovered in cost accounts | 1,500 |
| ***(g)*** | Interest on investment not included cost accounts | 5,000 |
| ***(h)*** | Obsolescence loss in respect of machineries charged in financial accounts | 2,450 |
| ***(i)*** | Income tax provided in financial accounts | 25,000 |
| ***(j)*** | Bank interest credited in financial accounts | 1,500 |
| ***(k)*** | Stores adjustments (debit in financial book) | 750 |

### *Answer*

***Reconciliation Statement***

| ***Particulars*** | ***Amount*** | ***Amount*** |
|---|---|---|
| ***Profit as per Cost Books*** | | ***51,950*** |
| ***Add:*** Opening stock overstated | 3,500 | |
| Closing stock understated | 4,600 | |
| Administration expenses over recovered | 750 | |
| Depreciation over recovered | 1,500 | |
| Interest on investment | 5,000 | |
| Bank interest credited | 1,500 | 16,850 |
| ***Less:*** Factory overheads under recovered | 2,500 | |
| Selling and distribution expenses under recovered | 1,650 | |
| Obsolescence loss | 2,450 | |
| Income tax provided | 25,000 | |
| Stores adjustment (debit in financial book) | 750 | (32,350) |
| ***Profit as per Financial Books*** | | ***36,450*** |

### *BQ 2*

M/s. H.K. Piano Company showed a net loss of ₹4,16,000 as per their financial accounts for the year ended 31st March. The cost accounts, however, disclosed a net loss of ₹3,28,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of books:

| | | |
|---|---|---|
| ***(1)*** | Factory overheads under recovered | 6,000 |
| ***(2)*** | Administration overheads over recovered | 4,000 |
| ***(3)*** | Depreciation charged in financial accounts | 1,20,000 |
| ***(4)*** | Depreciation recovered in costs | 1,30,000 |
| ***(5)*** | Interest on investment not included costs | 20,000 |
| ***(6)*** | Income-tax provided | 1,20,000 |
| ***(7)*** | Transfer fees (credit in financial books) | 2,000 |
| ***(8)*** | Stores adjustments (credit in financial book) | 2,000 |

***Prepare a Memorandum reconciliation account.***

### *Answer*

**Memorandum Reconciliation Account**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| **To Net loss as per Cost A/c** | **3,28,000** | By Admin. OH over recovered | 4,000 |
| To Factory OH under recovered | 6,000 | By Depreciation over recovered | 10,000 |
| To Income Tax | 1,20,000 | (1,30,000 – 1,20,000) | |
| | | By Interest on investment | 20,000 |
| | | By Transfer fees | 2,000 |
| | | By Stores adjustment | 2,000 |
| | | **By Net loss as per Financial A/c** | **4,16,000** |
| | **4,54,000** | | **4,54,000** |

## BQ 3

M/s Sellwell Ltd. has furnished you the following information from the financial books for the year ended 31st December 2023:

**M/s Sellwell Ltd.**
**Profit & Loss Account**
**(For the year ended 31st December 2023)**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Opening finished goods | 8,750 | By Sales (10,250 units) | 3,58,750 |
| (500 units × ₹17.50 per unit) | | By Closing finished goods | 6,250 |
| To Direct Materials Consumed | 1,30,000 | (250 units × ₹25 per unit) | |
| To Direct Wages | 75,000 | | |
| To Gross profit | 1,51,250 | | |
| | **3,65,000** | | **3,65,000** |
| To Factory overheads | 47,375 | By Gross profit | 1,51,250 |
| To Administration overheads | 53,000 | By Interest | 125 |
| To Selling expenses | 27,500 | By Rent received | 5,000 |
| To Bad debts | 2,000 | | |
| To Preliminary expenses | 2,500 | | |
| To Net profit | 24,000 | | |
| | **1,56,375** | | **1,56,375** |

***The cost sheet shows:***

***(a)*** The cost of materials as ₹13 per unit.
***(b)*** The labour cost as ₹7.50 per unit.
***(c)*** The factory overheads are absorbed at 60% of labour cost.
***(d)*** The administration overheads (related to production) are absorbed at 20% of factory cost.
***(e)*** Selling expenses ate charged at ₹3 per unit.
***(f)*** The opening stock of finished goods is valued at ₹22.50 per unit.

***You are required to prepare:***

***(1)*** The cost sheet showing elements of cost (use FIFO method for stock valuation),
***(2)*** The statement showing the reconciliation of profit or loss as shown by the cost accounts with the profit as shown by the financial accounts.

## Answer

**(1) Cost Sheet**

| Particulars | Amount (₹) |
|---|---|
| Direct materials @ ₹13 for 10,000 units | 1,30,000 |
| Direct wages @ ₹7.50 for 10,000 units | 75,000 |
| **Prime Cost** | **2,05,000** |
| Factory overheads at 60% of wages | 45,000 |
| **Factory Cost** | **2,50,000** |
| Administrative overheads at 20% of factory cost | 50,000 |

| | |
|---|---|
| ***Cost of Production*** | ***3,00,000*** |
| Add: Opening stock of finished goods (500 units × ₹22.50) | 11,250 |
| Less: Closing stock of finished goods | (7,500) |
| ***Cost of Goods Sold*** | ***3,03,750*** |
| Selling expenses at ₹3 per unit of 10,250 units | 30,750 |
| ***Cost of sales*** | ***3,34,500*** |
| Profit (balancing figure) | 24,250 |
| ***Sales*** | ***3,58,750*** |

***(2) Reconciliation Statement***

| ***Particulars*** | ***Amount*** | ***Amount*** |
|---|---|---|
| ***Profit as per Cost Accounts*** | | ***24,250*** |
| ***Add:*** Selling expenses over recovered (30,750 – 27,500) | 3,250 | |
| Opening stock over valued (11,250 – 8,750) | 2,500 | |
| Interest received | 125 | |
| Rent received | 5,000 | 10,875 |
| ***Less:*** Factory overheads under recovered (47,375 – 45,000) | 2,375 | |
| Administration overheads under recovered (53,000 – 50,000) | 3,000 | |
| Closing stock over valued (7,500 – 6,250) | 1,250 | |
| Bad debts | 2,000 | |
| Preliminary expenses | 2,500 | (11,125) |
| ***Profit as per Financial Accounts*** | | ***24,000*** |

***Working note:***

***(1)*** Calculation of units produced = Units sold + Closing finished units – Opening finished units

= 10,250 + 250 – 500

= ***10,000 units***

***(2)*** Value of closing finished goods $= \frac{\text{Cost of Production}}{\text{Units Produced}} \times$ Closing finished goods units

$= \frac{3,00,000}{10,000} \times 250 = $ ***₹7,500***

***Note:*** Closing stock is valued as per FIFO method.

***BQ 4***

Given below is the trading and profit and loss account of a company for the year ended 31st March 2023:

| ***Particulars*** | ***Amount*** | ***Particulars*** | | ***Amount*** |
|---|---|---|---|---|
| To Direct Materials | 27,40,000 | By Sales (60,000 units) | | 60,00,000 |
| To Direct Wages | 15,10,000 | By Closing finished goods (2,000 units) | | 1,60,000 |
| To Factory Expenses | 8,30,000 | By Closing Work in progress: | | |
| To Administration Expenses | 3,82,400 | Materials | 64,000 | |
| To Selling Expenses | 4,50,000 | Wages | 36,000 | |
| To Preliminary Expenses | 60,000 | Factory Expenses | 20,000 | 1,20,000 |
| To Net profit | 3,25,600 | By Dividend received | | 18,000 |
| | ***62,98,000*** | | | ***62,98,000*** |

***The company manufactures standard units. In the cost Accounts:***

***(1)*** Factory expenses have been allocated to production at 20% of prime cost.
***(2)*** Administrative expenses at ₹6 per unit produced.
***(3)*** Selling expenses at ₹8 per unit sold.

***Prepare the costing profit and loss account of the company and reconcile the same with the profit disclosed by the financial accounts.***

## Answer

**Costing Profit & Loss Account**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Direct Materials | 27,40,000 | By Sales (60,000 units) | 60,00,000 |
| To Direct Wages | 15,10,000 | By Closing finished goods (2,000 units) | 1,72,645 |
| To Factory Expenses | 8,50,000 | By Closing Work in progress | 1,20,000 |
| To Administration Expenses | 3,72,000 | | |
| To Selling Expenses | 4,80,000 | | |
| To Net profit | 3,40,645 | | |
| | **62,92,645** | | **62,92,645** |

**Reconciliation Statement**

| Particulars | Amount | Amount |
|---|---|---|
| **Profit as per Cost Accounts** | | **3,40,645** |
| **Add:** Factory expenses over recovered (8,50,000 – 8,30,000) | 20,000 | |
| Selling expenses over recovered (4,80,000 – 4,50,000) | 30,000 | |
| Dividend received | 18,000 | 68,000 |
| **Less:** Administration overheads under recovered (3,82,400 - 3,72,000) | 10,400 | |
| Closing stock over valued (1,72,645 – 1,60,000) | 12,645 | |
| Preliminary expenses | 60,000 | (83,045) |
| **Profit as per Financial Accounts** | | **3,25,600** |

**Working note:**

*(a)* Factory expenses = 20% of prime cost
= 20% (27,40,000 + 15,10,000) = **₹8,50,000**

*(b)* Administration expenses = ₹6 × 62,000 units = **₹3,72,000**

*(c)* Selling expenses = ₹8 × 60,000 units = **₹4,80,000**

*(d)* Number of units produced = Units sold + Units in closing finished goods
= 60,000 + 2,000 = **62,000 units**

*(e)* Value of closing finished goods = $\frac{\text{Cost of Production}}{\text{Units Produced}} \times$ Closing finished goods units

= $\frac{53,52,000}{62,000} \times 2,000$ = **₹1,72,645**

*(f)* Cost of production = 27,40,000 + 15,10,000 + 8,50,000 – 1,20,000 + 3,72,000
= **₹53,52,000**

## BQ 5

The following figures are available from the financial records of ABC Manufacturing Co. Ltd. for the year ended 31.03.2023.

| Particulars | ₹ |
|---|---|
| Sales (20,000 units) | 25,00,000 |
| Materials | 10,00,000 |
| Wages | 5,00,000 |
| Factory overheads | 4,50,000 |
| Office and administrative overheads (production related) | 2,60,000 |
| Selling and distribution overheads | 1,80,000 |
| Finished goods (1,230 units) | 1,50,000 |
| Work-in-process: | |

| | | |
|---|---|---|
| Materials | 30,000 | |
| Labour | 20,000 | |
| Factory overheads | 20,000 | 70,000 |
| Goodwill written off | | 2,00,000 |
| Interest on loan taken | | 20,000 |

In the Costing records, factory overhead is charged at 100% of wages, administration overhead 10% of factory cost and selling and distribution overhead at the rate of ₹10 per unit sold.

***Prepare a statement reconciling the profit as per cost records with the profit as per financial records.***

## *Answer*

***Profit & Loss Account of ABC Manufacturing Co. Ltd.***
***(For the year ended 31.03.2023)***

| *Particulars* | *Amount* | *Particulars* | *Amount* |
|---|---|---|---|
| To Opening finished goods | Nil | By Sales (20,000 units) | 25,00,000 |
| To Materials | 10,00,000 | By Closing stock: | |
| To Wages | 5,00,000 | Finished goods (1,230 units) | 1,50,000 |
| To Factory overheads | 4,50,000 | Work-in-process | 70,000 |
| To Office & Admin. overheads | 2,60,000 | | |
| To Selling & distribution Overheads | 1,80,000 | | |
| To Goodwill written off | 2,00,000 | | |
| To Interest on loan | 20,000 | | |
| To Profit | 1,10,000 | | |
| | ***27,20,000*** | | ***27,20,000*** |

***Cost Sheet***

| *Particulars* | *Amount* |
|---|---|
| Materials | 10,00,000 |
| Wages | 5,00,000 |
| Direct Expenses | Nil |
| ***Prime Cost*** | ***15,00,000*** |
| Factory overheads at 100% of wages | 5,00,000 |
| Less: Closing stock of WIP | (70,000) |
| ***Factory Cost*** | ***19,30,000*** |
| Office and administrative overheads at 10% of factory cost | 1,93,000 |
| ***Cost of Production (21,230 units)*** | ***21,23,000*** |
| Less: Closing stock of Finished goods {(21,23,000 ÷ 21,230) × 1,230 units} | (1,23,000) |
| ***Production cost of 20,000 units or COGS*** | ***20,00,000*** |
| Selling and distribution overheads at ₹10 per unit | 2,00,000 |
| ***Cost of sales*** | ***22,00,000*** |
| Profit (balancing figure) | 3,00,000 |
| ***Sales*** | ***25,00,000*** |

***Reconciliation Statement***

| *Particulars* | *Amount* | *Amount* |
|---|---|---|
| ***Profit as per Cost Accounts*** | | ***3,00,000*** |
| ***Add:*** Factory overheads over recovered | 50,000 | |
| Selling and distribution overheads over recovered | 20,000 | |
| Closing stock under valued in costs | 27,000 | 97,000 |
| ***Less:*** Office and administrative overheads under recovered | 67,000 | |
| Goodwill written off | 2,00,000 | |
| Interest on loan | 20,000 | (2,87,000) |
| ***Profit as per Financial Accounts*** | | ***1,10,000*** |

***BQ 6***

The following figures have been extracted from the Financial Accounts of a manufacturing firm for the first year of its operation:

| Particulars | ₹ |
|---|---|
| Direct material consumption | 50,00,000 |
| Direct wages | 30,00,000 |
| Factory overheads | 16,00,000 |
| General administration overheads | 7,00,000 |
| Selling and distribution overheads | 9,60,000 |
| Bad debts | 80,000 |
| Preliminary expenses written off | 40,000 |
| Legal charges | 10,000 |
| Dividends received | 1,00,000 |
| Interest received on deposits | 20,000 |
| Sales (1,20,000 units) | 1,20,00,000 |
| Closing stock: | |
| Finished goods (4,000 units) | 3,20,000 |
| Work-in-process | 2,40,000 |

The cost accounts for the same period reveal that the direct material consumption was ₹56,00,000. Factory overhead is recovered at 20% on prime cost. Administration overhead is recovered at ₹6 per unit of goods sold. Selling and distribution overheads are recovered at ₹8 per unit sold.

***Prepare the Profit and Loss Accounts as per financial records and Cost Sheet as per cost records. Reconcile the profits as per the two records.***

***Answer***

***Profit & Loss Account***
***(As per financial records)***

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Materials | 50,00,000 | By Sales (1,20,000 units) | 1,20,00,000 |
| To Wages | 30,00,000 | By Closing stock: | |
| To Factory overheads | 16,00,000 | Finished goods (4,000 units) | 3,20,000 |
| To Gross profit c/d | 29,60,000 | Work-in-process | 2,40,000 |
| | ***1,25,60,000*** | | ***1,25,60,000*** |
| To General administrave overheads | 7,00,000 | By Gross profit b/d | 29,60,000 |
| To Selling & distribution Overheads | 9,60,000 | By Dividends | 1,00,000 |
| To Bad debts | 80,000 | By Interest | 20,000 |
| To Preliminary expenses written off | 40,000 | | |
| To Legal charges | 10,000 | | |
| To Profit | 12,90,000 | | |
| | ***30,80,000*** | | ***30,80,000*** |

***Statement of Cost and Profit***
***(As per Cost Records)***

| Particulars | Amount |
|---|---|
| Direct materials | 56,00,000 |
| Direct wages | 30,00,000 |
| ***Prime Cost*** | ***86,00,000*** |
| Factory overheads (20% of 86,00,000) | 17,20,000 |
| Less: Closing stock of WIP | (2,40,000) |
| ***Cost of Production (1,24,000 units)*** | ***1,00,80,000*** |
| Less: Closing stock of Finished goods [(1,00,80,000 ÷ 1,24,000) × 4,000] | (3,25,161) |
| ***Cost of goods sold (1,20,000 units)*** | ***97,54,839*** |
| General administrative overheads (1,20,000 units @ ₹6 per unit) | 7,20,000 |

| | |
|---|---|
| Selling and distribution overheads (1,20,000 units @ ₹8 per unit) | 9,60,000 |
| ***Cost of sales*** | ***1,14,34,839*** |
| Net Profit (balancing figure) | 5,65,161 |
| ***Sales*** | ***1,20,00,000*** |

***Reconciliation Statement***

| | Particulars | Amount | Amount |
|---|---|---|---|
| | ***Profit as per Cost Accounts*** | | ***5,65,161*** |
| ***Add:*** | Excess of material consumption | 6,00,000 | |
| | Factory overheads over recovered | 1,20,000 | |
| | Administration overheads over recovered | 20,000 | |
| | Dividend received | 1,00,000 | |
| | Interest received | 20,000 | 8,60,000 |
| ***Less:*** | Closing stock over valued in costs (3,25,161 - 3,20,000) | 5,161 | |
| | Bad debts | 80,000 | |
| | Preliminary expenses written off | 40,000 | |
| | Legal charges | 10,000 | (1,35,161) |
| | ***Profit as per Financial Accounts*** | | ***12,90,000*** |

## *BQ 7*

The financial books of a company reveal the following data for the year ended 31st March, 2023:

***Opening stock:***

| | |
|---|---|
| Finished goods (625 units) | 53,125 |
| Work-in-process | 46,000 |

***During the year (01.04.22 to 31.03.23):***

| | |
|---|---|
| Raw materials consumed | 8,40,000 |
| Direct Labour | 6,10,000 |
| Factory overheads | 4,22,000 |
| Administration overheads (production related) | 1,98,000 |
| Dividend paid | 1,22,000 |
| Bad Debts | 18,000 |
| Selling and Distribution Overheads | 72,000 |
| Interest received | 38,000 |
| Rent received | 46,000 |
| Sales (12,615 units) | 22,80,000 |

***Closing stock:***

| | |
|---|---|
| Finished goods (415 units) | 45,650 |
| Work-in-process | 41,200 |

***The cost records provide as under:***

- Factory overheads are absorbed at 70% of direct wages.
- Administration overheads are recovered at 15% of factory cost.
- Selling and distribution overheads are charged at ₹3 per unit sold.
- Opening stock of finished goods is valued at ₹120 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit reporting.

***Required:***

***(i)*** Prepare statements for the year ended 31st March, 2023 to show
***(a)*** The profit as per financial records
***(b)*** The profit as per costing records.

***(ii)*** Present a statement reconciling the profit as per costing records with the profit as per Financial Records?

## Answer

### (i) (a) Financial Profit and Loss A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Opening stock: | | By Sales | 22,80,000 |
| WIP | 46,000 | By Closing stock: | |
| Finished goods | 53,125 | WIP | 41,200 |
| To Raw material consumed | 8,40,000 | Finished goods (375 units) | 45,650 |
| To Direct labour | 6,10,000 | | |
| To Gross profit | 8,17,725 | | |
| | **23,66,850** | | **23,66,850** |
| To Factory overheads | 4,22,000 | By Gross profit | 8,17,725 |
| To Administrative overheads | 1,98,000 | By Interest received | 38,000 |
| To Selling & Distribution overheads | 72,000 | By Rent received | 46,000 |
| To Dividend Paid | 1,22,000 | | |
| To Bad debts | 18,000 | | |
| To Net Profit | 69,725 | | |
| | **9,01,725** | | **9,01,725** |

### (i) (b) Cost Sheet showing Costing P/L (Production 12,405 units)

| Particulars | Amount |
|---|---|
| Direct Material | 8,40,000 |
| Direct labour | 6,10,000 |
| **Prime Cost** | **14,50,000** |
| Factory overhead (70% of direct wages) | 4,27,000 |
| Add: Opening WIP | 46,000 |
| Less: Closing WIP | (41,200) |
| **Factory Cost** | **18,81,800** |
| Administrative overhead (15% of factory cost) | 2,82,270 |
| **Cost of Production** | **21,64,070** |
| Add: Opening finished goods (₹120 × 625 units) | 75,000 |
| Less: Closing Stock of finished goods (W.N. 2) | (72,397) |
| **Cost of Goods Sold** | **21,66,673** |
| Selling & distribution overheads (₹3 × 12,615 units) | 37,845 |
| **Cost of sales** | **22,04,518** |
| Profit (balancing figure) | 75,482 |
| **Sales** | **22,80,000** |

### (ii) Reconciliation Statement

| Particulars | Amount | Amount |
|---|---|---|
| **Profit as per Cost Records (Cost Sheet)** | | **75,482** |
| **Add:** Interest Received | 38,000 | |
| Rent Received | 46,000 | |
| Administration overheads over recovered (2,82,270 – 1,98,000) | 84,270 | |
| Factory overheads over recovered (4,27,000 – 4,22,000) | 21,875 | |
| Opening stock overvalued (75,000 – 53,125) | 5,000 | **1,95,145** |
| **Less:** Dividend | 1,22,000 | |
| Bad debts | 18,000 | |
| Selling & distribution OH under recovered (72,000 – 37,845) | 34,155 | |
| Closing stock over valued (72,397 – 45,650) | 26,747 | **(2,00,902)** |
| **Profit as per Financial Records** | | **69,725** |

**Working note:**

**(1)** Number of units produced = Units sold + Closing finished units – Opening finished units

= 12,615 + 415 - 625 = **12,405 units**

**(2)** Value of closing finished goods $= \dfrac{\text{Cost of Production}}{\text{Units Produced}} \times \text{Closing finished goods units}$

$= \dfrac{21,64,070}{12,405} \times 415 = ₹72,397$

**Note:** Closing stock is valued as per FIFO method.

### BQ 8

The following information is available from the financial books of a company having a normal production capacity of 60,000 units of the year ended 31st March.

**(1)** Sales ₹10,00,000 (50,000 units).
**(2)** There was no opening and closing stock of finished units.
**(3)** Direct material and direct wages cost were ₹5,00,000 and ₹2,50,000 respectively.
**(4)** Actual factory expenses were ₹1,50,000 of which 60% are fixed.
**(5)** Actual administrative expenses were ₹45,000 which are completely fixed.
**(6)** Actual selling and distribution expenses were ₹30,000 of which 40% are fixed.
**(7)** Interest and dividends received ₹15,000.

***You are required to:***

**(a)** Find out profit as per financial books for the year ended 31st March.
**(b)** Prepare the cost sheet and ascertain the profit as per cost accounts for the year ended 31st March assuming that the indirect exp. are absorbed on the basis of normal production capacity.
**(c)** Prepare a statement reconciling profits shown by financial and cost books.

***[Financial Profit: ₹40,000; Cost Profit: ₹49,500]***

### BQ 9

A firm of Sport Equipments commenced business on 01.04.23 for manufacturing 2 varieties of bat 'Senior' and 'Sub-Junior'. The following information has been extracted from the account records for the half year period ended 30.09.23:

| | | |
|---|---|---|
| **(i)** | Average material cost per piece of 'Senior' bat | 80 |
| **(ii)** | Average material cost per piece of 'Sub-Junior' bat | 60 |
| **(iii)** | Average cost of labour per piece of 'Senior' bat | 140 |
| **(iv)** | Average cost of labour per piece of 'Sub-Junior' bat | 110 |
| **(v)** | Finished goods sold: | |
| | Senior | 300 pieces |
| | Sub-Junior | 700 pieces |
| **(vi)** | Sale price: | |
| | Per piece of 'Senior' bat | 500 |
| | Per piece of 'Sub-Junior' bat | 390 |
| **(vii)** | Work expenses incurred during the period | 1,20,000 |
| **(viii)** | Office expenses | 68,000 |

***You are required to prepare a statement showing:***

**(1)** The profit per each brand-piece of bat; charge labour and material at actual cost, works on cost at 100% on labour cost and office cost at 25% of works cost.
**(2)** Financial profit for the half year ending 30.09.23.
**(3)** Reconciliation between profit as shown by cost accounts and financial accounts.

### Answer

***Statements of Cost and Profit (As Per Cost Books)***
***For the half year ending 30th September 2023***

| Particulars | Senior Bat | | Sub Junior Bat | | Total |
|---|---|---|---|---|---|
| | Per unit | Total | Per unit | Total | |

| | | | | | |
|---|---|---|---|---|---|
| Material | 80 | 24,000 | 60 | 42,000 | 66,000 |
| Labour | 140 | 42,000 | 110 | 77,000 | 1,19,000 |
| ***Prime Cost*** | ***220*** | ***66,000*** | ***170*** | ***1,19,000*** | ***1,85,000*** |
| Works on-cost (100% of Labour) | 140 | 42,000 | 110 | 77,000 | 1,19,000 |
| ***Work Cost*** | ***360*** | ***1,08,000*** | ***280*** | ***1,96,000*** | ***3,04,000*** |
| Office on-cost (25% of Works Cost) | 90 | 27,000 | 70 | 49,000 | 76,000 |
| ***Total Cost*** | ***450*** | ***1,35,000*** | ***350*** | ***2,45,000*** | ***3,80,000*** |
| Profit | 50 | 15,000 | 40 | 28,000 | 43,000 |
| ***Sales*** | ***500*** | ***1,50,000*** | ***390*** | ***2,73,000*** | ***4,23,000*** |

***Profit And Loss Account (As Per Financial Books)***
***For the half year ending 30th September 2023***

| ***Particulars*** | | ***Amount*** | ***Particulars*** | | ***Amount*** |
|---|---|---|---|---|---|
| To Materials: | | | By Sales: | | |
| Senior Bat | 24,000 | | Senior Bat | 1,50,000 | |
| Sub Junior Bat | 42,000 | 66,000 | Sub Junior Bat | 2,73,000 | 4,23,000 |
| To Direct Wages: | | | | | |
| Senior Bat | 42,000 | | | | |
| Sub Junior Bat | 77,000 | 1,19,000 | | | |
| To Works Expenses | | 1,20,000 | | | |
| To Office Expenses | | 68,000 | | | |
| To Net profit | | 50,000 | | | |
| | | ***4,23,000*** | | | ***4,23,000*** |

***Reconciliation Statement***

| ***Particulars*** | ***₹*** |
|---|---|
| ***Profit as per Cost Books*** | ***43,000*** |
| Add: Office overheads over recovered (76,000 - 68,000) | 8,000 |
| Less: Works overheads under recovered (1,20,000 - 1,19,000) | (1,000) |
| ***Profit as per Financial Books*** | ***50,000*** |

# PAST YEAR QUESTIONS

### PYQ 1

The financial books of a company reveal the following data for the year ended 31st March, 2002:

**Opening stock:**

| | |
|---|---|
| Finished goods (875 units) | 74,375 |
| Work-in-process | 32,000 |

**During the year (01.04.01 to 31.03.02):**

| | |
|---|---|
| Raw materials consumed | 7,80,000 |
| Direct Labour | 4,50,000 |
| Factory overheads | 3,00,000 |
| Goodwill written off | 1,00,000 |
| Administration overheads | 2,95,000 |
| Dividend paid | 85,000 |
| Bad Debts | 12,000 |
| Selling and Distribution Overheads | 61,000 |
| Interest received | 45,000 |
| Rent received | 18,000 |
| Sales (14,500 units) | 20,80,000 |

**Closing stock:**

| | |
|---|---|
| Finished goods (375 units) | 41,250 |
| Work-in-process | 38,667 |

**The cost records provide as under:**

- Factory overheads are absorbed at 60% of direct wages.
- Administration overheads are recovered at 20% of factory cost.
- Selling and distribution overheads are charged at ₹4 per unit sold.
- Opening stock of finished goods is valued at ₹104 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit reporting.

**Required:**

*(i)* Prepare statements for the year ended 31st March, 2002 to show

*(a)* The profit as per financial records

*(b)* The profit as per costing records.

*(ii)* Present a statement reconciling the profit as per costing records with the profit as per Financial Records?

***[(15 Marks) May 2002]***

### Answer

**(i) (a) Financial Profit and Loss A/c**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Opening stock: | | By Sales (14,500 units) | 20,80,000 |
| WIP | 32,000 | By Closing stock: | |
| Finished goods (875 units) | 74,375 | WIP | 38,667 |
| To Raw material consumed | 7,80,000 | Finished goods (375 units) | 41,250 |
| To Direct labour | 4,50,000 | | |
| To Gross profit | 8,23,542 | | |
| | ***21,59,917*** | | ***21,59,917*** |
| To Factory overheads | 3,00,000 | | 8,23,542 |
| To Goodwill written off | 1,00,000 | By Gross profit | 45,000 |
| To Administrative overheads | 2,95,000 | By Interest received | 18,000 |

| | | | |
|---|---|---|---|
| To Bad debts | 12,000 | By Rent received | |
| To Selling & Distribution overheads | 61,000 | | |
| To Dividend Paid | 85,000 | | |
| To Net Profit | 33,542 | | |
| | ***8,86,542*** | | ***8,86,542*** |

### *(i) (b) Cost Sheet showing Costing P/L (Production 14,000 units)*

| ***Particulars*** | ***Amount*** |
|---|---|
| Direct Material | 7,80,000 |
| Direct labour | 4,50,000 |
| ***Prime Cost*** | ***12,30,000*** |
| Factory overhead (60% of direct wages) | 2,70,000 |
| Add: Opening WIP | 32,000 |
| Less: Closing WIP | (38,667) |
| ***Factory Cost*** | ***14,93,333*** |
| Administrative overhead (20% of factory cost) | 2,98,667 |
| ***Cost of Production*** | ***17,92,000*** |
| Add: Opening finished goods (₹104 × 875 units) | 91,000 |
| Less: Closing Stock of finished goods (W.N. 2) | (48,000) |
| ***Cost of Goods Sold*** | ***18,35,000*** |
| Selling & distribution overheads (₹4 × 14,500 units) | 58,000 |
| ***Cost of sales*** | ***18,93,000*** |
| Profit (balancing figure) | 1,87,000 |
| ***Sales*** | ***20,80,000*** |

### *(ii) Reconciliation Statement*

| ***Particulars*** | ***Amount*** | ***Amount*** |
|---|---|---|
| ***Profit as per Cost Records (Cost Sheet)*** | | ***1,87,000*** |
| ***Add:*** Interest Received | 45,000 | |
| Rent Received | 18,000 | |
| Administration OH over recovered (2,98,667 – 2,95,000) | 3,667 | |
| Opening stock overvalued (91,000 – 74,375) | 16,625 | ***83,292*** |
| ***Less:*** Goodwill written off | 1,00,000 | |
| Dividend | 85,000 | |
| Bad debts | 12,000 | |
| Factory OH under recovered (3,00,000 – 2,70,000) | 30,000 | |
| Selling & distribution OH under recovered (61,000 – 58,000) | 3,000 | |
| Closing stock over valued (48,000 – 41,250) | 6,750 | ***(2,36,750)*** |
| ***Profit as per Financial Records*** | | ***33,542*** |

***Working note:***

***(1)*** Number of units produced = Units sold + Closing finished units – Opening finished units

= 14,500 + 375 - 875 = ***14,000 units***

***(2)*** Value of closing finished goods $= \frac{\text{Cost of Production}}{\text{Units Produced}} \times \text{Closing finished goods units}$

$= \frac{17,92,000}{14,000} \times 375$ = ***₹48,000***

***Note:*** Closing stock is valued as per FIFO method.

## *PYQ 2*

A manufacturing company disclosed a net loss of ₹3,47,000 as per their cost accounts for the year ended March 31, 2003. The financial accounts however disclosed a net loss of ₹5,10,000 for the same period.

***The following information was revealed as a result of scrutiny of the figures of both the sets of accounts:***

| | | |
|---|---|---|
| *(a)* | Factory overheads under-absorbed | 40,000 |
| *(b)* | Administration overheads over-absorbed | 60,000 |
| *(c)* | Depreciation charged in financial accounts | 3,25,000 |
| *(d)* | Depreciation charged in cost accounts | 2,75,000 |
| *(e)* | Interest on investments not included in cost accounts | 96,000 |
| *(f)* | Income-tax provided | 54,000 |
| *(g)* | Interest on loan funds in financial accounts | 2,45,000 |
| *(h)* | Transfer fees (credited in financial books) | 24,000 |
| *(i)* | Stores adjustment (credited in financial books) | 14,000 |
| *(j)* | Dividend received | 32,000 |

***Prepare a Memorandum Reconciliation Account.***

***[(8 Marks) May 2003]***

## *Answer*

***Memorandum Reconciliation Account***

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| ***To Net Loss as per Cost books*** | ***3,47,000*** | By Admin. OH over recovered | 60,000 |
| To Factory OH under absorbed | 40,000 | By Interest on investment | 96,000 |
| To Depreciation under charged | 50,000 | By Transfer fees | 24,000 |
| To Income Tax | 54,000 | By Stores adjustment | 14,000 |
| To Interest on loan | 2,45,000 | By Dividend received | 32,000 |
| | | ***By Net loss as per Financial books*** | ***5,10,000*** |
| | ***7,36,000*** | | ***7,36,000*** |

## *PYQ 3*

***The following is the Trading and Profit & Loss Account of Omega Limited:***

| Particulars | Amount | Particulars | | Amount |
|---|---|---|---|---|
| To Materials consumed | 23,01,000 | By Sales (30,000 units) | | 48,75,000 |
| To Direct wages | 12,05,750 | By Finished goods stock | | 1,30,000 |
| To Production Overheads | 6,92,250 | (1,000 units) | | |
| To Administration Overheads | 3,10,375 | By Work-in-progress: | | |
| To Selling & Distribution Overheads | 3,68,875 | Materials | 55,250 | |
| To Preliminary Expenses written off | 22,750 | Wages | 26,000 | |
| To Goodwill written off | 45,500 | Production OH | 16,250 | 97,500 |
| To Fines | 3,250 | By Dividends received | | 3,90,000 |
| To Interest on Mortgage | 13,000 | By Interest on bank deposits | | 65,000 |
| To Loss on Sale of machine | 16,250 | | | |
| To Taxation | 1,95,000 | | | |
| To Net Profit for the year | 3,83,500 | | | |
| | ***55,57,500*** | | | ***55,57,500*** |

***Omega Limited manufactures a standard unit. The Cost Accounting records of Omega Ltd show the following:***

- *(a)* Production overheads have been charged to work-in-progress at 20% on Prime cost.
- *(b)* Administration overheads have been recovered at ₹9.75 per finished unit.
- *(c)* Selling & distribution overheads have been recovered at ₹13 per unit sold.
- *(d)* The under or over-absorption of overheads have not been transferred to costing P/L A/c.

***Required:***

- *(1)* Prepare a Costing Profit & Loss account, indicating net profit.
- *(2)* Prepare control accounts for production overheads, administration overheads and selling & distribution overheads.

*(3)* Prepare a statement reconciling the profit disclosed by cost records with that shown in financial accounts.

*[(15 Marks) Nov 2005]*

## Answer

### (1) Costing Profit & Loss A/c

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Direct Materials Consumed | 23,01,000 | By Sales | 48,75,000 |
| To Direct Wages | 12,05,750 | By Closing Stock: | |
| To Factory Overheads | 7,01,350 | Finished Goods (W.N.) | 1,42,350 |
| To Administration Overheads | 3,02,250 | WIP | 97,500 |
| To Selling & Distribution Overheads | 3,90,000 | | |
| To Costing Net profit | 2,14,500 | | |
| | ***51,14,850*** | | ***51,14,850*** |

**_Working note:_**

*(a)* Factory expenses = 20% of prime cost
= 20% (23,01,000 + 12,05,750) = ***₹7,01,350***

*(b)* Administration overheads = ₹9.75 × 31,000 units = ***₹3,02,250***

*(g)* Selling & Distribution OH = ₹13 × 30,000 units = ***₹3,90,000***

*(h)* Number of units produced = Units sold + Units in closing finished goods
= 30,000 + 1,000
= ***31,000 units***

*(i)* Value of closing finished goods = $\frac{\text{Cost of Production}}{\text{Units Produced}} \times$ Closing finished goods units

$= \frac{44,12,850}{31,000} \times 1,000$

= ***₹1,42,350***

*(j)* Cost of production = 23,01,000 + 12,05,750 + 7,01,350 – 97,500 + 3,02,250
= ***₹44,12,850***

### (2) Production Overhead Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 6,92,250 | By WIP A/c | 7,01,350 |
| To Balance c/f | 9,100 | | |
| | ***7,01,350*** | | ***7,01,350*** |

### Administration Overhead Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 3,10,375 | By Finished Goods A/c | 3,02,250 |
| | | By Balance c/f | 8,125 |
| | ***3,10,375*** | | ***3,10,375*** |

### Selling & Distribution Overhead Account

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Balance b/d | 3,68,875 | By Cost of Sales A/c | 3,90,000 |
| To Balance c/d | 21,125 | | |
| | ***3,90,000*** | | ***3,90,000*** |

**(3) Reconciliation Statement**

| Particulars | Amount | Amount |
|---|---|---|
| ***Profit as per Cost Records*** | | ***2,14,500*** |
| ***Add:*** Over recovery of factory overheads | 9,100 | |
| Over recovery of S & D overheads | 21,125 | |
| Dividend received | 3,90,000 | |
| Interest on bank deposits | 65,000 | ***4,85,225*** |
| ***Less:*** Under recovery of Administration overheads | 8,125 | |
| Preliminary expenses w/o | 22,750 | |
| Goodwill written w/o | 45,500 | |
| Fine debited in Financial books | 3,250 | |
| Interest on Mortgage | 13,000 | |
| Loss on sale of machine | 16,250 | |
| Tax paid | 1,95,000 | |
| Overvaluation of closing stock (1,42,350 – 1,30,000) | 12,350 | ***(3,16,225)*** |
| ***Profit as per Financial Records*** | | ***3,83,500*** |

### *PYQ 4*

A manufacturing company has disclosed a net loss of ₹2,13,000 as per their cost accounting records for the year ended March 31, 2009. However, their financial accounting records disclosed a net loss of ₹2,58,000 for the same period.

***A security of data of both the sets of books of accounts revealed the following information:***

| Details | | Amount |
|---|---|---|
| ***(a)*** | Factory overheads under absorbed | 5,000 |
| ***(b)*** | Administration overheads over absorbed | 3,000 |
| ***(c)*** | Depreciation charged in financial accounts | 70,000 |
| ***(d)*** | Depreciation charged in cost accounts | 80,000 |
| ***(e)*** | Interest on investments not included in cost accounts | 20,000 |
| ***(f)*** | Income tax provided in financial accounts | 65,000 |
| ***(g)*** | Transfer fees (credit in financial accounts) | 2,000 |
| ***(h)*** | Preliminary expenses written off | 3,000 |
| ***(i)*** | Over valuation of closing stock of finished goods in cost accounts | 7,000 |

***Prepare a Memorandum Reconciliation Account.***

***[(7 Marks) May 2009]***

### *Answer*

**Memorandum Reconciliation Account**

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| ***To Net Loss as per Cost Books*** | ***2,13,000*** | By Admin. OH over recovered | 3,000 |
| To Factory OH under absorbed | 5,000 | By Depreciation over charged (80,000 – 70,000) | 10,000 |
| To Income Tax | 65,000 | By Interest on investment | 20,000 |
| To Preliminary expenses w/o | 3,000 | By Transfer fees | 2,000 |
| To Over valuation of closing stock | 7,000 | ***By Net loss as per Financial Books*** | ***2,58,000*** |
| | ***2,93,000*** | | ***2,93,000*** |

### *PYQ 5*

A manufacturing company has disclosed a net loss of ₹8,75,000 as per their cost accounting records for the year ended March 31, 2010. However, their financial accounting records disclosed a net loss of ₹7,91,250 for the same period.

*RECONCILIATION 15.16*

***A scrutiny of the data of both the sets of books of accounts revealed the following information:***

| Details | | Amount |
|---|---|---|
| *(i)* | Factory overheads over-absorbed | 47,500 |
| *(ii)* | Administration overheads under-absorbed | 32,750 |
| *(iii)* | Depreciation charged in Financial Accounts | 2,25,000 |
| *(iv)* | Depreciation charged in Cost Accounts | 2,42,250 |
| *(v)* | Interest on investment not included in Cost Accounts | 62,750 |
| *(vi)* | Income tax provided in Financial Accounts | 7,250 |
| *(vii)* | Transfer fees (credit in Financial Accounts) | 12,500 |
| *(viii)* | Preliminary expenses written off | 27,500 |
| *(ix)* | Under- valuation of opening stock in Cost Accounts | 6,250 |
| *(x)* | Under valuation of closing stock in Cost Accounts | 17,500 |

***Prepare a Memorandum Reconciliation A/c.***

***[(8 marks) Nov 2010]***

## *Answer*

***Memorandum Reconciliation Account***

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| ***To Net Loss as per Cost Books*** | ***8,75,000*** | By Factory OH over recovered | 47,500 |
| To Admin. OH under absorbed | 32,750 | By Depreciation over charged | 17,250 |
| To Income Tax | 7,250 | By Interest on investment | 62,750 |
| To Preliminary expenses w/o | 27,500 | By Transfer fees | 12,500 |
| To Under valuation of opening stock | 6,250 | By Under valuation of closing stock | 17,500 |
| | | ***By Net loss as per Financial Books*** | ***7,91,250*** |
| | ***9,48,750*** | | ***9,48,750*** |

## *PYQ 6*

R Limited showed a net loss of ₹35,400 as per their cost accounts for the year ended 31st March, 2012. However, the financial accounts disclosed a net profit of ₹67,800 for the same period.

***The following information were revealed as a result of scrutiny of the figures of cost accounts and financial accounts:***

| | | |
|---|---|---|
| *(1)* | Administrative overhead under recovered | 25,500 |
| *(2)* | Factory overhead over recovered | 1,35,000 |
| *(3)* | Depreciation under charged in Cost Accounts | 26,000 |
| *(4)* | Dividend received | 20,000 |
| *(5)* | Loss due to obsolescence charged in Financial Accounts | 16,800 |
| *(6)* | Income tax provided | 43,600 |
| *(7)* | Bank interest credited in Financial Accounts | 13,600 |
| *(8)* | Value of opening stock: | |
| | In Cost Accounts | 1,65,000 |
| | In Financial Accounts | 1,45,500 |
| *(9)* | Value of closing Stock: | |
| | In Cost Accounts | 1,25,000 |
| | In Financial Accounts | 1,32,000 |
| *(10)* | Goodwill written- off in Financial Accounts | 25,000 |
| *(11)* | Notional rent of own premises charged in Cost Accounts | 60,000 |
| *(12)* | Provision for doubtful debts in Financial Accounts | 15,000 |

***Prepare a reconciliation statement by taking costing net loss as base.***

***[(8 Marks) Nov 2012]***

### Answer

**Reconciliation Statement**

| Particulars | ₹ | ₹ |
|---|---|---|
| **Loss as per Cost Records** | | **(35,400)** |
| **Add:** Factory overhead over recovered | 1,35,000 | |
| Dividend received | 20,000 | |
| Bank interest credited in financial A/c | 13,600 | |
| Opening stock overvalued in cost A/c (1,65,000 – 1,45,500) | 19,500 | |
| Closing stock undervalued in cost A/c (1,32,000 – 1,25,000) | 7,000 | |
| Notional rent charged in cost A/c | 60,000 | **2,55,100** |
| **Less:** Administrative overheads under recovered | 25,500 | |
| Depreciation under charged in cost A/c | 26,000 | |
| Loss due to obsolescence in Financial A/c | 16,800 | |
| Income Tax provided | 43,600 | |
| Goodwill w/o in financial A/c | 25,000 | |
| Provisions for doubtful debt in financial A/c | 15,000 | **(1,51,900)** |
| **Profit as per Financial Books** | | **67,800** |

### PYQ 7

A manufacturing company has disclosed net loss of ₹48,700 as per their cost accounting records for the year ended 31st March, 2014. However their financial accounting records disclosed net profit of ₹35,400 for the same period.

***A scrutiny of data of both the sets of books of accounts revealed the following informations:***

| | | | |
|---|---|---|---|
| ***(i)*** | Factory overheads under absorbed | | ₹30,500 |
| ***(ii)*** | Administrative overheads over absorbed | | ₹65,000 |
| ***(iii)*** | Depreciation charged in financial accounts | | ₹2,25,000 |
| ***(iv)*** | Depreciation charged in cost accounts | | ₹2,70,000 |
| ***(v)*** | Income tax provision | | ₹52,400 |
| ***(vi)*** | Transfer fee (credited in financial accounts) | | ₹10,200 |
| ***(vii)*** | Obsolescence loss charged in financial accounts | | ₹20,700 |
| ***(viii)*** | Notional rent of own premises charged in cost accounts | | ₹54,000 |
| ***(ix)*** | Value of opening stock: | | |
| | ***(a)*** | In cost accounts | ₹1,38,000 |
| | ***(b)*** | In financial accounts | ₹1,15,000 |
| ***(x)*** | Value of closing stock: | | |
| | ***(a)*** | In cost accounts | ₹1,22,000 |
| | ***(b)*** | In financial accounts | ₹1,12,500 |

***Prepare a Memorandum Reconciliation Account by taking costing loss as base.***

***[(5 Marks) May 2014]***

### Answer

**Memorandum Reconciliation Account**

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| **To Net loss as per Costing Books** | **48,700** | By Admin OH over absorbed | 65,000 |
| To Factory OH under absorbed | 30,500 | By Depreciation over charged (2,70,000 - 2,25,000) | 45,000 |
| To Income tax provision | 52,400 | | |
| To Obsolescence loss | 20,700 | By Transfer fee | 10,200 |
| To Closing stock over valued | 9,500 | By Notional rent | 54,000 |
| **To Net profit as per Financial Books** | **35,400** | By Opening stock over valued | 23,000 |
| | **1,97,200** | | **1,97,200** |

## PYQ 8

***The Trading and Profit and Loss Account of a company for the year ended 31.03.2016 is as under:***

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Materials | 26,80,000 | By Sales (50,000 units) | 62,00,000 |
| To Wages | 17,80,000 | By Closing stock (2,000 units) | 1,50,000 |
| To Factory expenses | 9,50,000 | By Dividend received | 20,000 |
| To Administrative expenses | 4,80,200 | | |
| To Selling expenses | 2,50,000 | | |
| To Preliminary expenses written off | 50,000 | | |
| To Net Profit | 1,79,800 | | |
| | ***63,70,000*** | | ***63,70,000*** |

***In the Cost Accounts:***

***(i)*** Factory expenses have been allocated to production at 20% of Prime Cost.
***(ii)*** Administrative expenses absorbed at 10% of factory cost.
***(iii)*** Selling expenses charged at ₹10 per unit sold.

***Prepare the Costing Profit and Loss Account of the company and reconcile the Profit/Loss with the profit as shown in the Financial Accounts.***

***[(8 Marks) Nov 2016]***

## Answer

***Costing Profit & Loss A/c***

| Particulars | Amount | Particulars | Amount |
|---|---|---|---|
| To Materials | 26,80,000 | By Sales (50,000 units) | 62,00,000 |
| To Wages | 17,80,000 | By Closing stock (2,000 units) | 2,26,431 |
| To Factory overheads | 8,92,000 | | |
| To Administration overheads | 5,35,200 | | |
| To S & D Expenses (50,000 × 10) | 5,00,000 | | |
| To Net profit | 39,231 | | |
| | ***64,26,431*** | | ***64,26,431*** |

***Working notes:***

***1.*** Factory overheads in costs = 20% of Prime cost
= 20% of (26,80,000 + 17,80,000) = ***8,92,000***

***2.*** Administrative overheads = 10% of Factory cost
= 10% of (26,80,000 + 17,80,000 + 8,92,000) = ***5,35,200***

***3.*** Valuation of closing stock = $\frac{\text{Cost of production}}{\text{Units produced}} \times \text{Units in Closing stock}$

$$= \frac{26{,}80{,}000 + 17{,}80{,}000 + 8{,}92{,}000 + 5{,}35{,}200}{52{,}000} \times 2{,}000 =$$ ***2,26,431***

***4.*** Units produced = Units sold + Closing units – Opening units
= 50,000 + 2,000 – Nil = ***52,000***

***Reconciliation Statement***

| Particulars | Amount | Amount |
|---|---|---|
| ***Profit as per Cost Accounts*** | | ***39,231*** |
| ***Add:*** Administrative expenses over recovered (5,35,200 – 4,80,200) | 55,000 | |
| Selling expenses over recovered (5,00,000 – 2,50,000) | 2,50,000 | |
| Dividend received | 20,000 | 3,25,000 |
| ***Less:*** Factory expenses under recovered (9,50,000 – 8,92,000) | 58,000 | |

| | | |
|---|---|---|
| Closing stock over valued in costs (2,26,431 – 1,50,000) | 76431 | |
| Preliminary expenses written off | 50,000 | (1,84,431) |
| ***Profit as per Financial Accounts*** | | ***1,79,800*** |

## *PYQ 9*

GK Limited showed a net loss of ₹2,43,300 as per their financial accounts for the year ended 31st March, 2018. However, cost accounts disclosed a net loss of ₹2,48,300 for the same period. On scrutinizing both the set of books of accounts, the following information were revealed:

| | | |
|---|---|---|
| ***(a)*** | Works overheads over recovered | 30,400 |
| ***(b)*** | Selling overheads under recovered | 20,300 |
| ***(c)*** | Administrative overhead under recovered | 27,700 |
| ***(d)*** | Depreciation over charged in cost accounts | 35,100 |
| ***(e)*** | Bad debts w/off in financial accounts | 15,000 |
| ***(f)*** | Preliminary Exp. w/off in financial accounts | 5,000 |
| ***(g)*** | Interest credited during the year in financial accountants | 7,500 |

***Prepare a reconciliation statement reconciling losses shown by financial and cost accounts by taking costing net loss as base.***

***[(5 marks) Nov 2018]***

## *Answer*

***Reconciliation Statement***

| ***Particulars*** | ***Amount*** | ***Amount*** |
|---|---|---|
| ***Loss as per Cost Records*** | | ***(2,48,300)*** |
| ***Add:*** Factory overhead over recovered | 30,400 | |
| Depreciation over charged in cost accounts | 35,100 | |
| Interest credited during the year in financial accounts | 7,500 | 73,000 |
| ***Less:*** Selling overheads under recovered | 20,300 | |
| Administrative overheads under recovered | 27,700 | |
| Bad debts w/off in financial accounts | 15,000 | |
| Preliminary Exp. w/off in financial accounts | 5,000 | (68,000) |
| ***Profit as per Financial Books*** | | ***(2,43,300)*** |

## *PYQ 10*

M/s Abid Private Limited disclosed a net profit of ₹48,408 as per cost books for the year ending 31st March 2019. However, financial accounts disclosed net loss of ₹15,000 for the same period. On scrutinizing both the set of books of accounts, the following information was revealed:

| | |
|---|---|
| Works Overheads under recovered in Cost Books | 48,600 |
| Office Overheads over recovered in Cost Books | 11,500 |
| Dividend received on Shares | 17,475 |
| Interest on Fixed Deposits | 21,650 |
| Provision for doubtful debts | 17,800 |
| Obsolescence loss not charged in Cost Accounts | 17,200 |
| Stores adjustments (debited in Financial Accounts) | 35,433 |
| Depreciation charged in financial accounts | 30,000 |
| Depreciation recovered in Cost Books | 35,000 |

***Prepare a Memorandum Reconciliation Account.***

***[(5 Marks) May 2019]***

## *Answer*

**Memorandum Reconciliation Account**

| Particulars | ₹ | Particulars | ₹ |
|---|---|---|---|
| To Works overhead under recovered | 48,600 | ***By Net profit as per Costing Books*** | ***48,408*** |
| To Provision for doubtful debts | 17,800 | By Admin overheads over recovered | 11,500 |
| To Obsolescence loss | 17,200 | By Dividend received | 17,475 |
| To Stores adjustments | 35,433 | By Interest on fixed deposits | 21,650 |
| | | By Depreciation over recovered (35,000 - 30,000) | 5,000 |
| | | ***By Net loss as per Financial Books*** | ***15,000*** |
| | ***1,19,033*** | | ***1,19,033*** |

## *PYQ 11*

The Profit and Loss account of ABC Ltd. for the year ended 31st March, 2021 is given below:

**Profit & Loss Account**
**(For the year ended 31st March, 2021)**

| | | | |
|---|---|---|---|
| To Direct Material | 6,50,000 | By Sales (15,000 units) | 15,00,000 |
| To Direct Wages | 3,50,000 | By Dividend received | 9,000 |
| To Factory overheads | 2,60,000 | | |
| To Administrative overheads | 1,05,000 | | |
| To Selling overheads | 85,000 | | |
| To Loss on sale of investments | 2,000 | | |
| To Net profit | 57,000 | | |
| | ***15,09,000*** | | ***15,09,000*** |

***Additional information:***

***(a)*** The factory overheads are 50% fixed and 50% variable.
***(b)*** The administration overheads are 100% fixed.
***(c)*** Selling overheads are completely variable.
***(d)*** Normal production capacity of ABC Ltd. is 20,000 units.
***(e)*** Indirect expenses are absorbed in the cost accounts on the basis of normal production capacity.
***(f)*** Notional rent of own premises charged in Cost Accounts is amounting to ₹12,000.

***You are required to:***

***(1)*** Prepare a Cost Sheet and ascertain the profit as per Cost records for the year ended 31st March, 2021.
***(2)*** Reconcile the Profit as per Financial Records with profit as per Cost Records.

***[(10 Marks) July 2021]***

## *Answer*

**(1) Cost Sheet**

| Particulars | Amount (₹) |
|---|---|
| Direct Materials | 6,50,000 |
| Direct Wages | 3,50,000 |
| ***Prime Cost*** | ***10,00,000*** |
| Factory Overheads: | |
| Variable (2,60,000 × 50%) | 1,30,000 |
| Fixed {(2,60,000 × 50%) × 15,000/20,000} | 97,500 |
| ***Factory Cost*** | ***12,27,500*** |
| Administrative Overheads (1,05,000 ×15,000/20,000) | 78,750 |
| Notional rent | 12,000 |
| ***Cost of Production*** | ***13,18,250*** |
| Selling Overheads (completely variable) | 85,000 |
| ***Cost of sales*** | ***14,03,250*** |
| Profit (balancing figure) | 96,750 |
| ***Sales*** | ***15,00,000*** |

***(2) Reconciliation Statement***

| ***Particulars*** | ***Amount*** |
|---|---|
| ***Profit as per Cost Accounts*** | ***96,750*** |
| ***Add:*** Dividend received | 9,000 |
| Notional rent | 12,000 |
| ***Less:*** Factory overheads under recovered (2,60,000 – 1,30,000 – 97,500) | 32,500 |
| Administration overheads under recovered (1,05,000 – 78,750) | 26,250 |
| Loss on sale of investments | 2,000 |
| ***Profit as per Financial Accounts*** | ***57,000*** |

### *PYQ 12*

R Ltd. showed a Net Profit of ₹3,60,740 as per their cost accounts for the year ended 31st March, 2021. The following information was revealed as a result of scrutiny of the figures from the both sets of accounts:

| | | |
|---|---|---|
| ***(a)*** | Over recovery of selling overheads in cost accounts | 10,250 |
| ***(b)*** | Over valuation of closing stock in cost accounts | 7,300 |
| ***(c)*** | Rent received credited in financial accounts | 5,450 |
| ***(d)*** | Bad debts provided in financial accounts | 3,250 |
| ***(e)*** | Income tax provided in financial accounts | 15,900 |
| ***(f)*** | Loss on sale of capital asset debited in financial accounts | 5,800 |
| ***(g)*** | Under recovery of administration overheads in cost accounts | 3,600 |

***Required: Prepare a reconciliation statement showing the profit as per financial records.***

***[(5 Marks) Dec 2021]***

### *Answer*

***Reconciliation Statement***

| ***Particulars*** | ***Amount*** | ***Amount*** |
|---|---|---|
| ***Profit as per Cost Books*** | | ***3,60,740*** |
| ***Add:*** Over recovery of selling overheads in cost accounts | 10,250 | |
| Rent received credited in financial accounts | 5,450 | 15,700 |
| ***Less:*** Over valuation of closing stock in cost accounts | 7,300 | |
| Bad debts provided in financial accounts | 3,250 | |
| Income tax provided in financial accounts | 15,900 | |
| Loss on sale of capital asset debited in financial accounts | 5,800 | |
| Under recovery of administration overheads in cost accounts | 3,600 | (35,850) |
| ***Profit as per Financial Books*** | | ***3,40,590*** |

### *PYQ 13*

'X' Ltd. follows Non-Integrated Accounting System. Financial Accounts of the company show a Net Profit of ₹5,50,000 For the year ended 31st March, 2022. The chief accountant of the company has provided following information form the Financial Accounts and Cost Accounts :

| ***SN.*** | ***Particulars*** | ***(₹)*** |
|---|---|---|
| (i) | Legal Charges provided in financial accounts | 15,250 |
| (ii) | Interim Dividend received credited in financial accounts | 4,50,000 |
| (iii) | Preliminary Expenses written off in financial accounts | 25,750 |
| (iv) | Over recovery of selling overheads in cost accounts | 11,380 |
| (v) | Profit on sale of capital asset credited in financial accounts | 30,000 |
| (vi) | Under valuation of closing stock in cost accounts | 25,000 |
| (vii) | Over recovery of production overheads in cost accounts | 10,200 |
| (viii) | Interest paid on Debentures shown in financial accounts | 50,000 |

**RECONCILIATION 15.22**

***Find out the Profit (Loss) as per Cost Accounts by preparing a Reconciliation Statement.***

***[(5 Marks) Nov 2022]***

## *Answer*

***Reconciliation Statement***

| Particulars | Amount | Amount |
|---|---|---|
| ***Profit as per Financial Books*** | | ***5,50,000*** |
| ***Add:*** Legal charges | 15,250 | |
| Preliminary expenses | 25,750 | |
| Interest paid on debentures | 50,000 | 91,000 |
| ***Less:*** Interim dividend received | 4,50,000 | |
| Over recovery of selling overheads | 11,380 | |
| Profit on sale of capital assets | 30,000 | |
| Under valuation of closing stock in cost accounts | 25,000 | |
| Over recovery of production overheads | 10,200 | (5,26,580) |
| ***Profit as per Cost Books*** | | ***1,14,420*** |

## *PYQ 14*

The following has been obtained from financial accounting and cost accounting records.

| | *Financial Accounting* | *Cost Accounting* |
|---|---|---|
| Factory Overhead | 94,750 | 90,000 |
| Administrative overhead | 60,000 | 57,000 |
| Selling Overhead | 55,000 | 61,500 |
| Opening Stock | 17,500 | 22,500 |
| Closing Stock | 12,500 | 15,000 |

***Indicate under-recovery and over-recovery and their effects on cost accounting profit.***

***Note:*** You are not required to prepare reconciliation statement.

***[(5 Marks) May 2023]***

## *Answer*

| *Particulars* | *Financial Accounting* | *Cost Accounting* | *Under-over Recovered* | *Effect on Cost Accounting Profit* |
|---|---|---|---|---|
| Factory Overhead | 94,750 | 90,000 | 4,750 under recovered | Increased |
| Administrative overhead | 60,000 | 57,000 | 3,000 under recovered | Increased |
| Selling Overhead | 55,000 | 61,500 | 6,500 over recovered | Decreased |
| Opening Stock | 17,500 | 22,500 | 5,000 over valued | Decreased |
| Closing Stock | 12,500 | 15,000 | 2,500 over valued | Increased |

# SUGGESTED REVISION

| Ques. No. | Observations or KEY Points (Note down during revisions) | Page No. of Practical Register | 1st & 2nd Revision | 3rd, 4th & 5th Revision | Revision during Exams |
|---|---|---|---|---|---|
| BQ (Book Questions covering Study Module of ICAI, PM, RTP's, MTP's and Important Questions) | | | | | |
| 1 | | | Y | Y | Y |
| 2 | | | Y | Y | Y |
| 3 | | | Y | Y | Y |
| 4 | | | Y | Y | Y |
| 5 | | | Y | Y | - |
| 6 | | | Y | Y | - |
| 7 | | | Y | Y | Y |
| 8 | | | Y | Y | Y |
| 9 | | | Y | - | - |
| PYQ (Past Year Questions) | | | | | |
| 1 | | | Y | Y | - |
| 2 | | | Y | Y | - |
| 3 | | | Y | Y | - |
| 4 | | | Y | Y | - |
| 5 | | | Y | Y | - |
| 6 | | | Y | Y | Y |
| 7 | | | Y | Y | Y |
| 8 | | | Y | Y | - |
| 9 | | | Y | - | - |
| 10 | | | Y | - | - |
| 11 | | | Y | Y | Y |
| 12 | | | Y | - | - |
| 13 | | | Y | - | - |
| 14 | | | Y | - | - |