Evaluating Performance 5

This Module Includes

Evaluating Performance

SLOB Mapped against the Module

1. Acquiring detailed insights into the principles of Management by Exception.
2. Command over principles of Standard Costing and Budgetary Control.
3. Expertise in Variance Analysis and Evaluation of Performance.

Module Learning Objectives:

After studying this module, the students will be able to –

- Acquiring detailed insights into the principles of Management by Exception.
- Command over principles of Standard Costing and Budgetary Control.
- Expertise in Variance Analysis and Evaluation of Performance.

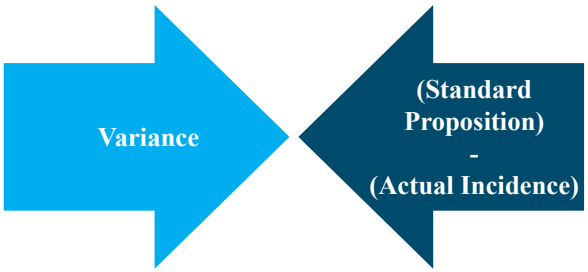
Variance Analyses

5.1

Introduction (Recapitulation)

Variance

Variance, by definition, denotes the deviation between the standard proposition and the actual incidence. The proposition could be a preset benchmark, budget or estimate and so on. The concept of variance is intrinsically connected with planned and actual results and effects of the difference between these two on the performance of the entity.



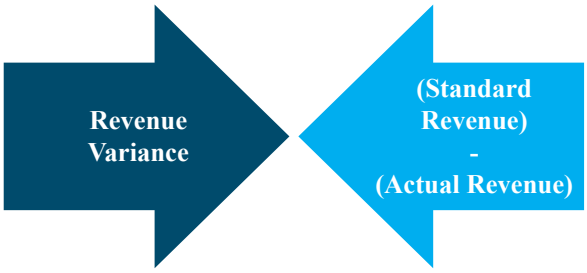
Variance analysis involves breaking down and analyzing the total variance to explain:

a. **Quantity:** How much of the variance is caused by using the resources that are different from the standards, i.e., the quantity variance; and

b. **Rate:** How much of the variance is caused by the cost of the resources being different from the standards, i.e. the rate (price) variance.

The main objective of variance analysis is to provide insights into the off-benchmark performance. It helps management to improve the operations and correct the errors on a concurrent basis; and deploy the resources more effectively and, thus, control and reduce costs and as also enhancing the revenues. An important feature of variance analysis is that it drives the enterprise towards quantitative analysis of the inputs and outputs whereby optimum productivity is achieved. Variance analysis is a tool that facilitates management by exception. Further, by recalibrating costs and prices by means of variance analysis, manufacturers can sustain themselves amidst uncertainties. In an era of global competition, Variance Analysis, certainly, continues to be an efficient tool for cost control.

Revenue Variance: Revenue Variance is the difference between planned, budgeted or standard revenue vis-à-vis the actual revenue generated. It is also known as Sales Variance and, in simple terms, denotes the difference between the Standard Revenue and the Actual Revenue. The derivation may be expressed as:



"Revenue Variance = (SR – AR) = (SQ × SP) – (AQ × AP)"

where

SR = Standard Revenue for the standard output;

AR = Actual Revenue for the actual output;

SQ = Standard Quantity of the output;

SP = Standard Price per unit;

AQ = Actual Quantity of the output; and

AP = Actual Price per unit.

Revenue Variance can be subdivided into Revenue Quantity Variance and Revenue Price Variance. Revenue Quantity Variance denotes the difference between the standard quantity of the output vis-à-vis the actual quantity, both at standard price. The derivation may be expressed as

"Revenue Quantity Variance = SP (SQ – AQ)"

where SP = Standard Price per unit;

SQ = Standard Quantity of the output; and

AQ = Actual Quantity of the output.

Revenue Price Variance denotes the difference between the standard price and the actual price for the actual quantity of the output. The derivation may be expressed as

"Revenue Price Variance = AQ (SP – AP)"

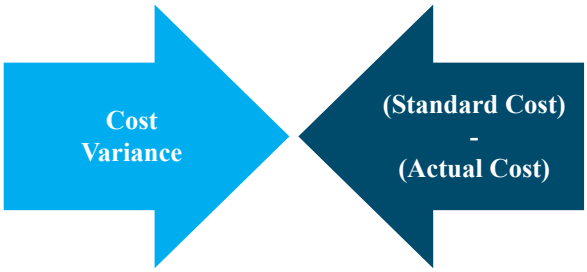
where AQ = Actual Quantity of the output;

SP = Standard Price per unit; and

AP = Actual Price per unit.

Cost Variance: Cost Variance is the difference between a planned, budgeted or standard cost vis-à-vis the actual cost. In other words, it is the difference between the standard cost and actual cost.

Cost Variances may be categorized element-wise such that as Direct Material Cost Variance, Direct Labour Cost Variance, Direct Expense Variance, Production Overhead Variance, Administration Overhead Variance, Selling Overhead Variance and Distribution Overhead Variance. They can also be broken down behaviour-wise into Variable Cost Variance and Fixed Cost Variance. For any of these categorizations, the key consideration is the convenience of cost control.



The general derivation for cost variance may be expressed as:

"Cost Variance = (SC – AC) = (SQ × SP) – (AQ × AP)"

where

SC = Standard Cost of the element for standard production;

AC = Actual Cost of the element for actual production;

SQ = Standard Quantity of the element for standard production;

SP = Standard Price per unit;

AQ = Actual Quantity of the element for actual production; and

AP = Actual Price per unit.

Cost Variance can be subdivided into Usage Variance and Price Variance. Usage Variance denotes the difference between the standard quantity of the element specified for the actual production and the actual quantity used, both at standard price. The derivation may be expressed as

"Usage Variance = SP (SQ – AQ)"

where

SP = Standard Price per unit;

SQ = Standard Quantity of the element needed for the standard output; and

AQ = Actual Quantity of the element consumed.

Usage Variance brings out the deviations in the cost of an element arising from consumption of non-standard elements. Usage Variance is, generally, impacted by the factors of input mix and yield.

Price Variance denotes the difference between the standard price and the actual price for the actual quantity of the element consumed. The derivation may be expressed as

"Price Variance = AQ (SP – AP)"

where AQ = Actual Quantity of the element consumed;

SP = Standard Price per unit; and

AP = Actual Price per unit.

Material Cost Variance: Material Cost Variance denotes the difference between the standard cost of the material needed and the actual cost of the material consumed for the production achieved. The derivation may be expressed as:

Material Cost Variance = (SC – AC) = (SQ × SP) – (AQ × AP)

where

SC = Standard Cost of the material for standard production;

AC = Actual Cost of the material for actual production;

SQ = Standard Quantity of the material for standard production;

SP = Standard Price per unit;

AQ = Actual Quantity of the material for actual production; and

AP = Actual Price per unit.

Material Cost Variance can be subdivided into Material Usage Variance and Material Price Variance.

Material Usage Variance: Material Usage Variance denotes the difference between the standard quantity of the material specified for the actual production and the actual quantity used, both at standard price. The derivation may be expressed as

"Material Usage Variance = SP (SQ – AQ)"

where

SP = Standard Price per unit;

SQ = Standard Quantity of the material needed for the standard output; and

AQ = Actual Quantity of the material consumed.

Material Usage Variance brings out the deviations in the material cost arising from consumption of non-standard materials. Some of the reasons for the material usage variance may be listed as:

a. Variation in usage of materials due to inefficient or careless use, or economic use of materials.
b. Changes in the specification or design of the product.
c. Purchase of inferior materials or change in quality of materials
d. Inefficiency in production resulting in wastages
e. Use of substitute materials.
f. Theft or pilferage of materials.
g. Inefficient labour force leading to excessive utilisation of materials.
h. Yield from materials in excess of or less than that provided as the standard yield.
i. Inaccurate standards
j. Change in composition of a mixture of materials for a specified output.

Material Usage Variance is, generally, impacted by the factors of input mix and yield and hence can be subdivided into Material Mix Variance and Material Yield Variance. The derivations may be expressed as:

Material Mix Variance	=	SP × (Revised Standard Quantity – Actual Quantity)

Material Yield Variance	=	SP × (Standard Yield – Actual Yield)

Material Price Variance: Material Price Variance denotes the difference between the standard price and the actual price for the actual quantity of the material consumed. The derivation may be expressed as:

"Material Price Variance = AQ (SP – AP)"

where AQ = Actual Quantity of the material consumed;

SP = Standard Price per unit; and

AP = Actual Price per unit.

Some of the reasons for the material price variance may be sated as:

a. Change in basic purchase price of material.

b. Change in quantity of purchase or uneconomical size of purchase order.

c. Rush order to meet shortage of supply, or purchase in less or more favourable market.

d. Transit losses and discrepancies.

e. Change in quality or specifications of material purchased.

f. Use of substitute material having a higher or lower unit price.

g. Change in the pattern or amounts of taxes and duties.

Labour Cost Variance: Labour Cost Variance denotes the difference between the standard cost of the labour needed and the actual cost of the labour consumed for the production achieved. The derivation may be expressed as:

Labour Cost Variance = (SC – AC) = (ST × SR) – (AT × AR)

where

SC = Standard Cost of the labour needed;

AC = Actual Cost of the labour consumed;

ST = Standard Time of the labour needed;

SR = Standard Rate per unit of time;

AT = Actual Time of the labour spent; and

AR = Actual Rate per unit of time.

Labour Cost Variance can be subdivided into Labour Rate Variance and Labour Efficiency Variance.

Labour Rate Variance: Labour Rate Variance denotes the difference between the standard rate per unit of time and the actual rate for the actual time consumed. The derivation may be expressed as:

Labour Rate Variance = AT (SR – AR)

where

AT = Actual Time of the labour spent;

SR = Standard Rate per unit of time; and

AR = Actual Rate per unit of time.

Some of the reasons for the labour rate variance may be stated as:

a. Change in basic wage structure or change in piece-work rate.

b. Employment of workers of grades and rates of pay different from those specified, due to shortage of labour of the proper category, or through mistake, or due to retention of surplus labour.

c. Payment of guaranteed wages to workers who are unable to earn their normal wages if such guaranteed wages form part of direct labour cost.

d. Overtime and night shift work in excess of or less than the standard, or where no provision has been made in the standard.

e. The composition of a gang as regards the skill and rates of wages being different from that laid down in the standard.

Labour Efficiency Variance: Labour Efficiency Variance denotes the difference between the standard time specified for the standard production and the actual time spent, both at the standard rate. The derivation may be expressed as:

Labour Efficiency Variance = SR (ST – AT)

where

SR = Standard Rate per unit of time;

ST = Standard Time of the labour needed for the standard production; and

AT = Actual Time of the labour spent.

Some of the reasons for the labour efficiency variance may be stated as:

a. Lack of proper supervision.

b. Poor working conditions.

c. Delays due to waiting for materials, tools, instructions, etc.

d. Defective machines, tools and other equipments.

e. Machine break-down.

f. Basic inefficiency of workers due to low morale, insufficient training, faulty instructions, incorrect scheduling of jobs, etc.

g. Use of non-standard material requiring more or less operation time.

h. Increase in labour turnover.

Labour Efficiency Variance can be subdivided into Mix Variance, Yield Variance and Idle Time Variance. The derivations may be expressed as:

Labour Mix Variance	=	(Cost of Actual Hours at Standard Rate of Standard Gang) - (Cost of Actual Hours at Standard Rate of Actual Gang) or SR × (Revised Standard Hours – Actual Hours)

Labour Yield Variance	=	Standard Cost Per Unit × (Standard Output for Actual Mix - Actual Output) or SR × (Standard Hours – Revised Standard Hours)

Idle Time Variance	=	Standard Rate per Hour × (Actual Hours Paid for - Actual Hours Worked) or (Standard Rate per Hour × Idle Time)

Overhead Cost Variance: Overhead Cost Variance denotes the difference between the standard overhead cost specified for the production achieved and the actual overhead cost incurred. In other words, overhead cost variance is under or over absorption of overheads. The derivation may be expressed as:

Overhead Variance = (SC – AC) = (SB × SR) – (AB × AR)

where

SC = Standard Overhead Cost specified for the standard production;

AC = Actual Overhead Cost incurred;

SB = Standard Quantum of the Overhead Base;

SR = Standard Overhead Rate per unit of the Base;

AB = Actual Quantum of the Overhead Base; and

AR = Actual Overhead Rate per unit of the Base.

Overhead Variance can be subdivided into Overhead Volume Variance and Overhead Expenditure Variance. Overhead Volume Variance is quantitative in nature and denotes the difference between cost for the actual quantum of the base at the standard overhead rate and the cost for the standard quantum at standard overhead rate. Overhead Efficiency Variance denotes the difference between the cost for the production achieved at standard overhead rate and the cost for the actual quantum of the base at the standards overhead rate. The relevant formulae may be expressed as:

Overhead Volume Variance	=	Standard Rate × (Actual Units – Standard Units)

Overheard Expenditure Variance	=	Actual Units × (Standard Rate – Actual Rate)

Example 1

The computation of the variances is demonstrated by means of illustrative data relating to XPML. Monthly Data of Production and Cost detailing the standards and actuals are furnished as follows.

XPML: Monthly Data of Production and Cost

Serial	Item	Standards	Actuals
1	Working Days	30	29
2	Production in MT	1025	1060
3	Sale price in ₹ Per MT	40250	40000
4	Raw Material		

XPML: Monthly Data of Production and Cost			
Serial	**Item**	**Standards**	**Actuals**
	A. Quantity in MT	1250	1285
	B. Rate per MT (₹)	20000	20250
5	Workers		
	A. Number of Workers	80	80
	B. Man Days	2400	2320
	C. Wage Rate in ₹ per Day	700	725
6	Power		
	A. KWH per MT of Production	650	640
	B. ₹ Per KWH	7.10	7.10
7	Fuel		
	A. MT per MT of Production	0.60	0.58
	B. ₹ Per MT	3000	3100
8	Chemical Consumption (₹ Per MT)	1800	1750
9	Wire Clothing (₹ Per MT)	400	380
10	Packing Material (₹ per MT)	300	320
11	Fixed Expenses		
	A. Factory Expenses (₹ Lakhs Per Month)	12.00	11.50
	B. Admn. Expenses (₹ Lakhs Per Month)	18.00	20.00
	C. Selling Expenses (₹ Lakhs Per Month)	12.00	12.50
	D. Sub Total	42.00	44.00

Computation of Variances:

1. Sales Variance

(Standard Revenue – Actual Revenue)	=	(1025 × 40250) – (1060 × 40000) = (412.56 – 424.00) = ₹ 11.44 Lakhs (F)

(a) Sales Quantity Variance

SP × (SQ – AQ)	=	40250 (1025 -1060) = ₹ 14.09 Lakhs (F)

(b) Sales Price Variance

AQ × (SP – AP)	=	1060(40250 - 40000) = ₹ 2.65 Lakhs (A)

(c) Check

Sales Variance	=	(Sales Quantity Variance + Sales Price Variance) = 14.09 F + 2.65 A = ₹ 11.44 Lakhs (F)

2. Material Cost Variance

(Standard Cost– Actual Cost)	=	(1250 × 20000) – (1285 × 20250) = (250.00 – 260.21) = ₹ 10.21 Lakhs (A)

(a) Material Usage Variance

SP × (SQ - AQ)	=	20000 (1250 -1285) = ₹ 7.00 Lakhs (A)

(b) Material Price Variance

AQ (SP – AP)	=	1285 (20000 - 20250) = ₹ 3.21 Lakhs (A)

(c) Check

Material Cost Variance	=	(Material Usage Variance + Material Price Variance) = 7.00 A + 3.21 A = 10.21 A

3. Labour Cost Variance

(Standard Cost– Actual Cost)	=	(2400 × 700) – (2320 × 725) = (16.80 – 16.82) = ₹ 0. 02 Lakhs (A)

(a) Labour Rate Variance

AT × (SR – AR)	=	2320 (700 – 725) = ₹ 0.58 Lakhs (A)

(b) Labour Efficiency Variance

SR × (ST – AT)	=	700 (2400 – 2320) = ₹ 0.56 Lakhs (F)

(c) Check

Labour Cost Variance	=	(Labour Rate Variance + Labour Efficiency Variance) = 0.58 A + 0.56 F = 0.02 A

4. Power Cost Variance

(Standard Cost for Standard Production – Actual Cost for Actual Production)	=	(1025 × 650 × 7) – (1060 × 640 × 7.10) = (46.63 – 48.16) = ₹ 1.53 Lakhs (A)

(a) Power Rate Variance

(Standard Cost for Actual Units – Actual Cost for Actual Units)	=	(1060 × 650) (7.00 - 7.10) = (689000 × – 0.10) = ₹ 0.68 Lakhs (A)

(b) Power Volume Variance

(Standard Cost for standard units of Standard Production – Standard Cost for Actual Production)	=	7 ((1025 × 650) – (1060 × 640)) = 46.64 – 47.49 = ₹ 0.85 Lakhs (A)

(c) Check

Power Cost Variance	=	(Power Rate Variance + Power Volume Variance) 0.68 A + 0.85 A = 1.53 A

5. Fuel Cost Variance

(Standard Cost for Standard Production – Actual Cost for Actual Production)	=	(1025 × 0.60 × 3000) – (1060 × 0.58 × 3100) = (18.45 – 19.06) = ₹ 0.61 Lakhs (A)

(a) Fuel Rate Variance

(Standard Cost for Actual Units – Actual Cost for Actual Units)	=	(1060 × 0.58) (3000 - 3100) = (614.8 × -100) = ₹ 0.62 Lakhs (A)

(b) Fuel Volume Variance

(Standard Cost for standard units of Standard Production – Standard Cost for Actual Production)	=	3000 (1025 × 0.60) – (1060 × 0.58) = 3000(615.00 – 614.80) = ₹ 0.01 Lakhs (F)

(c) Check

Fuel Cost Variance	=	(Fuel Rate Variance + Fuel Volume Variance) = 0.62 A + 0.01 F = 0.61 A

6. Chemical Cost Variance

(Standard Cost for Standard Production – Actual Cost for Actual Production)	=	(1025 × 1800) – (1060 × 1750) = (18.45 – 18.55) = ₹ 0.10 Lakhs (A)

(a) Chemical Rate Variance

AQ × (SR – AR)	=	1060 (1800 – 1750) = ₹ 0.53 Lakhs (F)

(b) Chemical Volume Variance

SR × (SQ – AQ)	=	1800 (1025 -1060) = ₹ 0.63 Lakhs (A)

(c) Check

Chemical Cost Variance	=	(Chemical Rate Variance + Chemical Volume Variance) = 0.53 F + 0.63 A = 0.10 A

7. Wire Clothing Cost Variance

(Standard Cost for Standard Production – Actual Cost for Actual Production)	=	(1025 × 400) – (1060 × 380) = (4.10 – 4.03) = ₹ 0.07 Lakhs (F)

(a) Wire Clothing Rate Variance

AQ × (SR – AR)	=	1060 (400 - 380) = ₹ 0.21 Lakhs (F)

(b) Wire Clothing Volume Variance

SR × (SQ – AQ)	=	400 (1025 -1060) = ₹ 0.14 Lakhs (A)

(c) Check

Wire Clothing Cost Variance	=	(Wire Clothing Rate Variance + Wire Clothing Volume Variance) = 0.21 F + 0.14 A = 0.07 F

8. Packing Material Variance

(Standard Cost for Standard Production – Actual Cost for Actual Production)	=	(1025 × 300) – (1060 × 320) = (3.08 –3.39) = ₹ 0.31 Lakhs (A)

(a) Packing Material Rate Variance

AQ × (SR – AR)	=	1060 (300 - 320) = ₹ 0.21 Lakhs (A)

(b) Packing Material Volume Variance

SR × (SQ – AQ)	=	300 (1025 -1060) = ₹ 0.10 Lakhs (A)

(c) Check

Packing Material Variance	=	(Packing Material Rate Variance + Packing Material Volume Variance) = 0.21 A + 0.10 A = 0.31 A

9. Fixed Cost Expenditure Variance

(Budgeted Cost – Actual Cost)	=	(12.00 + 18.00 + 12.00) – (11.50 + 20.00 + 12.50) = ₹ 2.00 Lakhs (A)

Summary of the variance Analysis is as follows:

XPML: Summary of Variance Analysis

₹ in Lakhs

Serial	Item	Standard	Actual	Variance
1	Revenue	412.56	424.00	11.44
2	Variable Costs			
	a. Raw Material	250.00	260.21	-10.21
	b. Direct Wages	16.80	16.82	-0.02
	c. Variable Expenses			
	i. Power	46.63	48.16	

Serial	Item	Standard	Actual	Variance
	ii. Fuel	18.45	19.06	
	iii. Chemicals	18.45	18.55	
	vi. Wire Clothing	4.10	4.03	
	v. Packing Material	3.08	3.39	
	vi. Sub Total (i..v)	90.71	93.19	-2.48
	d. Total (a..c)	357.51	370.22	-12.71
3	Contribution	55.05	53.78	-1.27
4	Fixed Expenses	42.00	44.00	-2.00
5	Margin	13.05	9.78	-3.27

Note: F = Favourable; A = Adverse

It may be observed that XPML has planned for a standard revenue of ₹ 412.56 lakhs for the month with a targeted margin of ₹ 13.05 lakhs. The company achieved a higher revenue of ₹ 424.00 lakhs, but fell short of the margin by ₹ 3.27 lakhs, the primary reason being a disproportionate increase in costs. The computations furnished above, would trace the causes element wise and enable decisions for corrective actions.

5.1.1 Investigation of Variances

Investigation of variances implies systematic examination of deviations undertaken for the purpose of initiating corrective actions. As such, Variance analysis is the quantitative investigation of the difference between actual and planned behaviour. Such an analysis is used to maintain control over a business through the investigation of areas in which performance was unexpectedly off the mark. Since the analysis of variances consumes resources and money not all variances need to be investigated. Management takes up only the significant variances for probing. As a common practice, minor deviations from the propositions, such as standards or budgets or estimates and random variances are not considered for investigation. The following factors need attention while deciding which variances to investigate and which variances not to investigate.

1. **Adverse or Favourable:** Adverse variances tend to attract most attention as they indicate problems. However, there is an argument for the investigation of favourable variances so that a business can learn from its successes. At the same time, it must be noted that all adverse variances are not bad and all favourable variances are not indicators of efficiency in operation. An adverse variance might result from something that is good that has happened in the business. For example, a budget statement might show higher production costs than budget (adverse variance). However, these may have occurred because sales are significantly higher than budget (favourable budget). In a standard costing system, some favorable variances are not indicators of efficiency in operations. For example, the materials price variance, the labour rate variance, the manufacturing overhead spending and budget variances, and the production volume variance are generally not related to the efficiency of the operations. On the other hand, the materials usage variance, the labour efficiency variance, and the variable manufacturing efficiency variance are indicators of operating efficiency. However, it is possible that some of these variances could result from standards that were not realistic. For example, if it realistically takes 2.4 hours to produce a unit of output, but the standard is set for 2.5 hours, there should be a favorable variance of 0.1 hour. This 0.1-hour variance results from the unrealistic standard, rather than operational efficiency. Remember, it is the cause and significance of a variance that matters – not whether it is favourable or adverse.

2. **Materiality:** The size of the variance may indicate the scale of the problem and the potential benefits arising from its correction. Small variations in a single period are bound to occur and are unlikely to be significant. Investigation of such variances is likely to be time-consuming and irritating from the manager concerned. For such variations further investigation is not worth the effort.
3. **Trends:** One adverse variance may be caused by a random event; but a series of adverse variances would definitely need investigation. If, say, an efficiency variance is ₹ 1,000 adverse in month 1, the obvious conclusion is that the process is out of control and that corrective action must be taken. This may be correct but what if the same variance is ₹ 1,000 adverse every month? The trend indicates that the process is in control and the standard has been wrongly set. Suppose, though, that the same variance is consistently ₹ 1,000 adverse for each of the first six months of the year but the production has steadily fallen from 100 units in month 1 to 65 units by month 6. The variance trend in absolute terms is constant, but relative to the number of units produced, efficiency has steadily worse.
4. **Controllability:** Controllability must also influence the decision whether to investigate further. If there is general worldwide price increase in the price of an important raw material there is nothing that can be done internally to control the effect of this. If a central decision is made to award all employees a 10% increase in salary, staff costs will increase by this amount and variance is not controllable by manager. Uncontrollable variances call for a change in the plan and not an investigation into past.
5. **Interdependencies:** Sometimes a variance in one area is related to a variance in another. For example, a favourable raw material price variance resulting from the purchase of a lower grade of material may cause an adverse labour efficiency variance because the lower grade material is harder to work with. These two variances would need to be considered jointly before making an investigation decision.
6. **Inherent Nature:** The inherent variability of the cost or revenue. Some costs, by nature, are quite volatile (oil prices, for example) and variances would therefore not be surprising. Other costs, such as labour rates, are far more stable and even a small variance may indicate a problem.
7. **Reliability:** Reliability and accuracy of the figures warrant due consideration. For example, mistakes in calculating budget figures or in recording actual costs and revenues could lead to a variance being reported inaccurately.

Cost Benefit Analysis of Investigation

In order to decide as to whether a variance shall be investigated or not, it is worth to carry out a cost benefit analysis. The costs of investigation would consist of:

(a) the cost of investigating the variance, and

(b) cost of corrective action (i.e., action needed to correct the process and to bring it back under control.

The benefit side would include the cost of allowing the process to continue as it is, i.e., in an out-of-control state. Investigation is taken up only if the cost of allowing the present state to continue exceeds the costs of investigation and correction.

The three important methods, that are in vogue to decide whether a variance should be investigated (or not), may be sated as:

(i) Managerial Intuition and Judgment

(ii) Expected Value Method

(iii) Statistical Control Chart Method

(i) Managerial Intuition and Judgment: Most of the firms prescribe the limits of variances expressed in terms of (a) absolute monetary amount, (for example ₹ 2,500 per month in case stationery expenses) or (b) as a percentage of the standard proposition, (for example 0.25% of the budget) or (c) both, as guidelines for investigation. Variances falling within these limits are considered to be in-control state and hence are not investigated. Variances beyond the limits are out-of-control variances and are taken up for investigation. The practice in some firms is to prescribe such limits separately for each element of costs and for revenue.

The limits are fixed partly on historical experience and partly on intuition. The basic assumptions are that variances falling within the limits fixed are under in-control and that the costs of investigation of such variances and bringing back the process into control will be higher than the cost of allowing the present state to continue. The intuition method is simple and inexpensive and, though not statistically justified like the other two methods, if fixed with proper care, may be reasonably accurate.

(ii) Expected Value Method: In this method, the probabilities of a variance being in out-of-control and in-control states are estimated and a payoff matrix is formed in the manner shown below:

Action		State	
		In-control	Out-of-control
	Probability	P_1	P_2
	Investigate, a_i	C_i	$C_i + Cc$
	Do not investigate, a_0	0	C_b

P_1 = Probability associated with in-control state

P_2 = Probability associated with out-of-control state

C_j = Cost of investigation

C_c = Cost of bringing back the process in-control

C_b = Cost of allowing the out-of-control state to continue

a_i = Value of the action to investigate

a_0 = Value of action not to investigate

From the pay-off matrix, we find that,

Expected value, $a_i = P_1C_i + P_2(C_i + C_c)$, and

Expected value, $a_0 = P_1 \times 0 + P_2C_b$,

If $a_i > a_0$, the decision will be not to investigate;

If $a_i < a_0$, the decision will be to investigate;

If $a_i = a_0$, the management will be indifferent, i.e. it is immaterial whether or not the variance is investigated.

When $a_i = a_0$, $P_1C_i + P_2 (C_i + C_c) = P_2C_b$.

But $P_1 + P_2 = 1$, or $P_1 = 1 - P_2$

Therefore, $(1 - P_2) C_i + P_2 (C_i + C_c) = P_2C_b$

Or $P_2 = [C_i \div (C_b - C_c)]$

In the above situation, P_2 becomes the break-even probability which indicates that the decision will be to investigate only if the estimated probability of the out of - control state is greater than the break-even probability, viz. $[C_i \div (C_b - C_c)]$.

This may be illustrated by assigning numerical values to the symbols. Let us assume that,

$P_1 = 0.85$, $P_2 = 0.15$, $C_i = ₹\ 300$, $C_c = ₹\ 2{,}000$, and $C_b = ₹\ 5{,}000$

$P_2 = [C_i \div (C_b - C_c)]$

$P_2 = [300 \div (5000 - 2000)] = 0.1$

Since P_2 (0.15) is higher than the break-even probability, the decision will be to investigate. This will be evident from the following, where $a_i < a_o$;

Expected value, $a_i = P_1C_i + P_2(C_i + C_c) = 0.85 \times 300 + 0.15\ (300+2{,}000) = ₹\ 600$

Expected value, $a_o = P_1 \times 0 + P_2C_b = 0 + 0.15 \times 5{,}000 = ₹\ 750$

The limitation of the expected value method arises mainly from the following:

(i) Estimation of the value of probability distribution for out-of-control state is difficult.

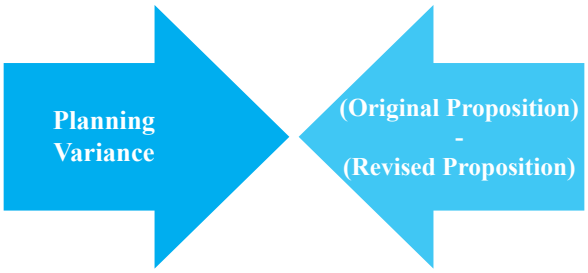
(ii) It is difficult to calculate the value of C_b, the cost of allowing the out-of-control state to continue.

(iii) Statistical Control Chart method: Statistical Quality Control is based on the concept that repetitive processes are subject to a certain amount of chance variability which has a stable pattern. A process is said to be in- control if all measurements fall within this pattern of variability. Items outside the pattern are in out-of-control state needing investigation. Thus. if we build up the parameters within which a standard or budgeted cost item should vary, we can find out whether a variance should or should not be investigated.

5.1.2 Planning and Operating Variances

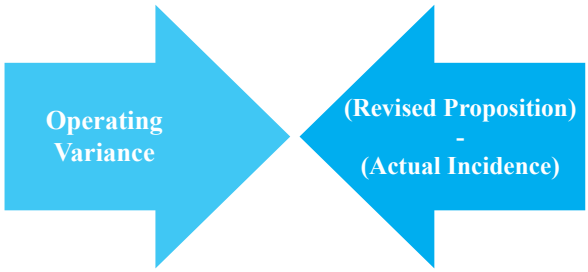
Introduction

May it be standard costing, may it be budgetary control or may it be any other system, explaining the causes of variances is a key step in variance analysis. In some cases, the cause is due to poor budgeting and planning (e.g., the planners used an out-of-date price list when setting the standard cost of materials). In some cases, the cause is purely operational (e.g., the price of raw materials went up due to market shortages). Often causes are a mixture of planning and operating factors. Some firms seek to make these distinctions more explicit by separating out planning and operating variances. The basic approach is to have two budgets - the original budget and a revised one that takes into account planning issues so that we can then determine two sets of variances viz. planning variances and operating variances.



Planning Variance denotes the deviation between the original proposition and the revised proposition whereas Operating Variance denotes the deviation between the revised proposition and the actual incidence.

Planning variances seek to explain the extent to which the original standard needs to be adjusted in order to reflect changes in operating conditions between the current situation and that envisaged when the standard was originally calculated. In effect it means that the original standard is brought up to date so that it is a realistic attainable target in current conditions. Operating variances indicate the extent to which attainable targets (i.e., the adjusted standards) have been achieved. Operating variances would be calculated after the planning variances have been established and are Thus, a realistic way of assessing performance.



Planning and Operating Variances for Sales

Sales volume variance as also the sales price variance can be sub-divided into a planning variance and operational variance. The relevant formulae are as under.

Sales Quantity Planning Variance (Market Size Variance)	=	Standard Price (Revised Sales Quantity – Original Sales Quantity) = (Revised Sales Quantity × Standard Price) – (Original Sales Quantity × Standard Price)

Sales Quantity Operating Variance (Market Share Variance)	=	Standard Price (Actual Sales Quantity - Revised Sales Quantity) = (Actual Sales Quantity × Standard Price) – Revised Sales Quantity × Standard Price)

Sales Price Planning Variance	=	Actual Quantities Sold (Revised Sale Price – Original Sale Price) = (Revised Sale Price × Actual Quantities Sold) – (Original Sale Price × Actual Quantities Sold)

Sales Price Operating Variance	=	Actual Quantities Sold (Actual Sale Price –Revised Sale Price) = (Actual Sale Price × Actual Quantities Sold) – Revised Sale Price × Actual Quantities Sold)

Illustration 1

The concepts of Sales Price Planning Variance and Sales Operating Variance are explained by means of the following illustration.

Product	Budget Sale Price (₹)	Revised Sales Price (₹)	Actual Sales Price (₹)	Budget Sale Units	Actual Sale Units
P1	20	15	18	2000	1900
P2	25	30	25	2000	2300
P3	25	27	28	2000	2000

Sales Price Planning Variance = Actual Sale Units (Revised Sale Price – Budget Sale Price)

Product	Actual Sale Units	Revised Sales Price - Budget Sale Price	Sales Price Planning Variance	Nature
P1	1900	(15 -20) = -5	1900 × -5 = -9500	Adverse
P2	2300	(30 -25) = 5	2300 × 5 = 11500	Favourable
P3	2000	(27 -25) = 2	2000 × 2 = 4000	Favourable
Total			6000	Favourable

Sales Price Operating Variance = Actual Sale Units (Actual Sale Price – Revised Sale Price)

Product	Actual Sale Units	Actual Sales Price - Revised Sale Price	Sales Price Planning Variance	Nature
P1	1900	(18 - 15) = 3	1900 × 3 = 5700	Favourable
P2	2300	(25 - 30) = -5	2300 × - 5 = -11500	Adverse
P3	2000	(28 - 27) = 1	2000 × 1 = 2000	Favourable
Total			-3800	Adverse

There are a number of factors causing a change in the product costs to change. These factors can be planned or unplanned events. A change in the cost of any product will compel the management to change the selling price. The budgeted or standard selling price will need to be revised; the difference in the selling price for actual number of units sold will then give the variance in the sale price planning.

Causes for sales price planning variance include:

- Change in the raw materials prices, compelling management to revise sale prices significantly
- Inefficient operations or unskilled labour, causes the product prices to rise or conversely efficient production to control the costs
- Market competition, with fewer competitors likely to achieve favourable sale price variance and intense competition to result in adverse

Competitive and attractive sales price for a product can be the difference between a successful and failed product launch. Also, for market leaders, to maintain the market share it is important to keep the variances in check. A well-planned sale price can help a company gain competitive advantage in the market.

Achieving the revised sales price is the responsibility of the operational managers, however, some controllable or unforeseen factors can still cause the difference in the actual sale prices. The deviation in the revised sales price and

the actual sales price is operational sales price variance. Some external factors, such as new entrants in the market can compel the management to sell the products at lower than revised prices. Some operational inefficiency such as unavailability of important raw material components can cause an increase the production costs.

Here are some of the factors that contribute to budget revisions and sales price operating variances:

- The threat of new competitors compelling management to lower the sales prices
- Unavailability of input components or increase in the raw material prices
- Inefficiency in operations leading to wastes and idle labour hours
- Seasonal product demand or lack of competition may temp the management to increase sales prices
- Operational efficiencies and economies of scale can also lead to favourable sales price variances

Revising the sales price budgets is inevitable for any management; however, closing the revised and actual sale price gaps should be the real focus. A careful interpretation of the drivers behind the variances can help achieve the desired goals. Sales price largely depend on the input components, securing long term supplier contracts, bulk buying discounts, and regular supplies can help reduce costs. Efficient operations and labour can also contribute towards lower product costs that can help achieving favourable sales price variance.

Planning and Operating Variances for Material and Labour Costs

In case of materials and labour, planning and operational variances can be calculated by comparing original and revised budgets (planning) and revised budgets with actual results (operational). A material price planning variance is really useful to provide feedback on just how skilled managers are in estimating future prices. The operational variance is more meaningful as it measures the purchasing department's efficiency given the market conditions that prevailed at that time. It ignores factors which cannot be controlled by purchasing department.

When applying planning and operating principles to cost variances (material and labour), care must be taken over flexing the budgets. One accepted approach is to flex both the original and revised budgets to actual production levels.

Example 2: Revising the Budget

Rhodes Co manufactures Stops which it is estimated require 2 kg of material XYZ at ₹ 100/kg In week 21 only 250 Stops were produced although budgeted production was 300. 450 kg of XYZ were purchased and used in the week at a total cost of ₹ 51,000 Later it was found that the standard had failed to allow for a 10% price increase throughout the material supplier's industry. Rhodes Ltd carries no stocks.

Solution::

(i) Actual Results

= 450 kgs for ₹ 51,000

(ii) Revised flexed budget

= 250 units @ 2 kg per unit and @ ₹ 110 per kg = ₹ 55,000

(iii) Operating Variance = (51,000 – 55,000) = 4000 (A)

(iv) Original flexed budget

= 300 units @ 2 kg per unit and @ ₹ 100 per kg = ₹ 60,000

(v) Planning Variance = (55,000 – 60,000) = 5000 (A)

Example 3: Revising the Budget

A transport business makes a particular journey regularly, and has established that the standard fuel cost for each journey is 20 litres of fuel at ₹ 80 per litre. New legislation has forced a change in the vehicle used for the journey and an unexpected rise in fuel costs. It is decided retrospectively that the standard cost per journey should have been 18 litres at ₹ 100 per litre.

Required: Calculate the original and revised flexed budgets if the journey is made 120 times in the period.

Solution:

Original flexed budget: 120 × 20 × 80 = ₹ 1,92,000

Revised flexed budget: 120 × 18 × 100 = ₹ 2,16,000

Direct materials form the largest chunk of the product cost. Careful planning for material usage and securing favorable prices, can save costs and increase profitability. Total material costs can change due to a change in raw material pricing or change in component usage. Material variance can be divided into the material price and material usage variances. A material price variance is simply finding each unit of product cost in comparison to the estimated cost. Material usage variance deals with the total input material component(s) usage per unit of product. The planning and operational variances for any measure can be calculated as the difference between planned budget and revised and actual results and revised budgets. Similarly, both material price and usage variance can be analyzed in terms of planning and operating variances.

Labour variance is unique in the sense that labour hours cannot be procured or saved in advance as materials. Top management can only plan using past data and forecasts to set standard labour hour rates and total labour costs. During operations, many factors affect production, and results are often different from planned. Total direct labour variance can also be divided into direct labour rate and direct labour efficiency variances. From planning and operational point of view, each of the two components, can further be analysed as Direct labour Rate Planning & Operational Variances and Direct labour Efficiency Planning & Operational Variances.

The following illustration demonstrates the computation and analysis of Material and Labour Variances.

Illustration 2

Green Chemicals produces agriculture fertilizers with following information provided. The management analysed past data and set the budgeted rates as following:

Standard hours per unit of product = 1.1

Standard direct labour rate per hour = ₹ 18.50

Standard usage of material per unit = 1.2 kg per unit

Standard price of material per unit = ₹ 70

During production times, the management revised the budgets with updated information as:

Revised price of material per unit = ₹ 71

Revised labour rate per hour = ₹ 20 per hour

Revised hours per unit of product = 1.05

Revised usage of material per unit = 1.175 kg per unit

After the production period the company recorded the following actual results:

Actual Production = 15,400

Raw Material usage = 16,555 KGs

Actual cost of raw material = ₹ 11,91,960 or ₹ 72 per KG

Actual labour costs= 16,632 hours and ₹ 3,24,324 or ₹ 19.50 per hour.

Calculate the Raw Material and Direct labour Planning & Operational Variances.

Solution:

(i) Calculation of Raw Material Price Variances

Raw Material Price Variance = Actual Quantity (Standard Price - Actual Price)

=16555 (70 – 72) = ₹ 33,110 Adverse

Raw Material Price Planning variance

= Actual Quantity (Standard Price - Revised Price)

= 16555 (70 - 71) = ₹ 16,555 Adverse

Raw Material Price Operational variance

= Actual Quantity (Revised Price – Actual Price)

= 16555 (71 – 72) = ₹ 16,555 Adverse

Check

Raw Material Price Variance

= Sum of Planning Variance and Operational Variance

= (₹ 16,555 Adverse + ₹ 16,555 Adverse)

= ₹ 33,110 Adverse

(ii) Calculation of Raw Material Usage Variances

Raw Material Usage Variance

= Standard Price (Standard Quantity – Actual Quantity)

=70 [(15400 × 1.2) - 16555]

= 70 (18480 - 16555) = ₹ 1,34,750 Favourable

Raw Material Usage Planning Variance

= Standard Price (Standard Quantity - Revised Quantity)

=70 [(15400 × 1.2) - [(15400 × 1.175)]

= 70 (18480 - 18095) = ₹ 26,950 Favourable

Raw Material Usage Operational Variance

= Standard Price (Revised Quantity - Actual Quantity)

=70 [(15400 × 1.175) -16555]

=70 (18095 -16555) = ₹ 1,07,800 Favourable

Check

Raw Material Usage Variance

= Sum of Planning Variance and Operational Variance

= (₹ 26,950 Favourable + ₹ 1,07,800 Favourable)

= ₹ 1,34,750 Favourable

Raw Material Variance = Standard Cost – Actual Cost

= (15400 units × 1.2 kg × ₹ 70) – (11,91,960)

= (12,93,600 – 11,91,960) = ₹ 1,01,640 Favourable

Or

Raw Material Variance = Sum of Price Variance and Usage Variance

= (₹ 33,110 Adverse + ₹ 1,34,750 Favourable)

= ₹ 1,01,640 Favourable

(iii) Calculation of Labour Rate Variances

Direct Labour Rate Variance = Actual Hours (Standard Rate - Actual Rate)

=16632 (18.50 – 19.50) = ₹ 16,632 Adverse

Direct Labour Rate Planning variance

= Actual Hours (Standard Rate - Revised Rate)

= 16632 (18.50 - 20.00) = ₹ 24,948 Adverse

Direct Labour Rate operational variance

= Actual Hours (Revised Rate – Actual Rate

= 16632 (20.00 – 19.50) = ₹ 8,316 Favourable

Check

Direct Labour Rate Variance

= Sum of Planning Variance and Operational Variance

= (₹ 24,948 Adverse + ₹ 8,316 Favourable) = ₹ 16,632 Adverse

(iv) Calculation of Labour Efficiency Variances

Direct Labour Efficiency Variance

= Standard Rate (Standard Hours – Actual Hours)

=18.50 [(15400 × 1.1) - 16632]

= 18.50 (16940 - 16632) = ₹ 5698 Favourable

Direct labour Efficiency Planning Variance

= Standard Rate (Standard Hours - Revised Hours)

=18.50 [(15400 × 1.1) - [(15400 × 1.05)]

= 18.50 (16940 -16170) = ₹ 14,245 Favourable

Direct Labour Efficiency Operational Variance

= Standard Rate (Revised Hours - Actual Hours)

= 18.50 [(15400 × 1.05) -16632]

= 18.50 (16170 -16632) = ₹ 8547 Adverse

Check

Direct Labour Efficiency Variance

= Sum of Planning Variance and Operational Variance

= (₹ 14,245 Favourable + ₹ 8,547 Adverse)

= ₹ 5698 Favourable

Direct Labour Variance = Standard Cost – Actual Cost

= (15400 units × 1.1 hours × ₹ 18.50) – (16632 hours × 19.50)

= (3,13,390 – 3,24,324) = ₹ 10,934 Adverse

Or

Direct Labour Variance

= Sum of Rate Variance and Efficiency Variance

= (₹ 16,632 Adverse + ₹ 5698 Favourable) = ₹ 10,934 Adverse

(v) Summary

The summary of variances may be presented in a tabular form as follows:

Serial	Description	Planning	Operational	Total
1	**Raw Material**			
a	Raw Material Price Variance	16,555 (A)	16,555 (A)	33,110 (A)
b	Raw Material Usage Variance	26,950 (F)	1,07,800 (F)	1,34,750 (F)
c	Sub Total	10,395 (F)	91,245 (F)	1,01,640 (F)
2	**Direct Labour**			
a	Direct Labour Rate Variance	24,948 (A)	8,316 (F)	16,632 (A)
b	Direct Labour Efficiency Variance	14,245 (F)	8547 (A)	5,698 (F)
c	Sub Total	10,703 (A)	231 (A)	10,934 (A)
3	**Total**	**308 (A)**	**91,014 (F)**	**90,706 (F)**

(vi) Observations

(a) The planning variance consists of ₹ 10,395 (Favourable) with respect to Raw Material and ₹ 10,703 (Adverse) in relation to Direct Labour, both together aggregating to ₹ 308 (Adverse). Even though the variance looks smaller at the aggregate level, it is substantial at the element level and hence needs further probing as to the causes and effects.

(b) The operational variance consists of ₹ 91,245 (Favourable) with respect to Raw Material and ₹ 231 (Adverse) in relation to Direct Labour, both together aggregating to ₹ 91,014 (Favourable). Favourable Direct Labour Operational Variance of ₹ 8,316 is neutralized by Adverse Direct Labour Efficiency

Operational Variance of ₹ 8,547. Therefore, all the elements of variance (material as also labour) warrant further probing as to the causes and effects.

Assimilation

Revision of original proposition is the basic cause for the Planning and Operational variances to occur. The analysis, as demonstrated in the earlier illustrations, can be extended to each and every element of revenue and cost, both direct and indirect. Competitive markets demand responsive actions to adjust to the market trends. A careful interpretation of the planning variances can help the planners to identify the reasoning for the change. Study of operating variances encourages operational managers to achieve efficiency in production processes.

5.1.3 Controllable and Non-Controllable Variances

The variance may be classified as Controllable and Uncontrollable., depending upon the controllability of the factors causing variances. Variance is said to be controllable if it is identified as the primary responsibility of a particular person or department. It refers to the deviation caused by such factors which could be influenced by the managerial/ executive action. For example, the excessive use of materials or labour hours than the standards can be attributable to a particular person.

When the variations are due to the factors beyond the control of the concerned person or department, it is said to be uncontrollable. The rise in prices of materials, increase in wage rates, Govt. restrictions etc., are the examples of uncontrollable variance. These factors are not within the control of the management and the responsibility of the variance cannot be assigned to any particular person or division. Revision of the standard becomes necessary to avoid non-recurrence of such variance in future.

The division of variance into controllable and uncontrollable is important from the view point of management as it can place more emphasis on controllable variance and Thus, facilitate the principle of management by exception. Standard costing to be more realistic, sometimes the standards set are to be revised on account of changes in uncontrollable factors like wages, materials etc. To take into account these factors into variance, a 'revised variance' is created and the basic standard is allowed to continue.

This revision variance is the difference between the standard cost originally set and the revised standard cost. The size of controllable variance reflects the degree of efficiency of the person/department. It is the controllable variance with which the management is concerned because it needs remedial measures. Finding variance is not the ultimate objective of the cost management. But their analysis and finding the causes of variance is the ultimate aim to control cost. Control of cost depends on the corrective action taken by the management. The analysis of variance helps the management to locate deficiency and assign responsibility to particular person or cost centre. The next step of the management is to find out the reason for the variance to pin points where necessary, corrective action should be taken over.

5.1.4 Relevant Cost Approach to Variance Analysis

'What is the relevancy?' is a contextual question that keeps springing up in many a process of managerial decision making. The term relevancy signifies, 'the quality or state of being closely connected or appropriate' with respect to the contextual situation. The context could be revenues, costs or even variances.

In cost and management accounting, notion of relevant costing has a lot of significance because these costs are pertinent with respect to a particular decision. A relevant cost for a particular decision is the one that changes the result if an alternative course of action is chosen. Studies have demonstrated that relevant costs will make a difference in decision making. And, therefore, a similar approach is advocated in variance analysis too.

The main intent of relevant costing is to determine the objective cost of a business decision. An objective measure of the cost of a business decision is the degree of profit that shall result from its execution. The fundamental principles of relevant costing are quite simple and managers can perhaps relate the concept relevancy to variance analysis. Costs are relevant, if they direct the executive towards the decision. So also, whether particular variances are relevant for decision making depends on decision circumstance and the options available.

Relevant variance analysis may be perceived as an incremental investigation which indicates that it considers only relevant costs, that is the costs that vary between alternatives, and ignores sunk costs that is the costs which have been incurred, which cannot be changed and therefore are inappropriate to the business situation.

The notion of the relevant variance is very helpful to eliminate irrelevant information from a particular decision-making process. Variances arising from committed contractual obligations such as price escalations in material costs; wage increases springing up from agreements with wage boards; power rates spiraling from electricity boards; etc. could become irrelevant for operating controls. By eliminating irrelevant variances from the process of decision making, management is prevented from focusing on information that might inaccurately affect its decision.

Moving forward, conventional approach to variance analysis is to compute variances based on acquisition cost and standard prices for the acquisition of the resources. This is misleading, when scarce resources exist. Failure to use scarce resources efficiently leads not only to increased acquisition cost but also to a lost contribution. Therefore, meaningful approach is to incorporate the lost contribution in variance analysis. For example, if scarce material is used excessively, it will cause material costs to be high and in addition there will be lost contribution, which should be attached to material usage variance. When this approach is used, price or expenditure variances are not affected. Quantity variance is affected by how efficiently scarce resource is being used.

5.1.5 Variance Analysis under Marginal Costing and Absorption Costing

Absorption of Overheads

Under absorption costing we use single overhead absorption rate to absorb overheads, because of the fact that overheads are not segregated into variable and fixed. Variances will occur if the absorption rate is incorrect (just as we will get over/under-absorption). Under absorption costing we calculate the overhead expenditure variance and the overhead volume variance. Overhead volume variance can, further, be split into a capacity variance and efficiency variance.

Marginal Costing is a very important technique in solving managerial problems and contributing in various areas of decisions. Marginal costing distinguishes between fixed costs and variable costs which in turn facilitates the analysis of variances to their causes and points of incidence. In that it takes a leap forward, from the absorption costing, and classifies overhead (indirect cost) variance into:

a. Variable Overhead Variance
b. Fixed Overhead Variance

Variable Overhead Variance: Variable Overhead Variance is the difference between the standard variable overhead cost allowed for the actual output achieved and the actual variable overhead cost. This variance is represented by expenditure variance only because variable overhead cost will vary in proportion to production whereby only a change in expenditure can cause such variance. The derivation may be expressed as:

Variable Overhead Variance	=	(Actual Output × Standard Variable Overhead Rate) – (Actual Variable Overheads)

Variable overhead variance can be sub divided into Variable Overhead Expenditure Variance and Variable

Overhead Efficiency Variance. The derivations may be expressed as:

Variable Overhead Expenditure Variance	=	(Actual Units × Standard Variable Overhead Rate) – (Actual Units × Actual Variable Overhead Rate) Or AU × (SR – AR)

Variable Overhead Efficiency Variance	=	Standard Variable Overhead Rate per unit × (Standard Units for Actual Production - Actual Units)

Variable overhead expenditure variance resembles the rate variance is calculated in a similar manner.

Fixed Overhead Variance: Fixed Overhead Variance is that portion of total overhead cost variance which is due to the difference between the standard cost of fixed overhead allowed for the actual output achieved and the actual fixed overhead cost incurred. The derivation may be expressed as:

Fixed Overhead Variance	=	Fixed Overheads Absorbed – Actual Fixed Overheads Or (SU × SR) – (AU × AR)

Fixed overhead variance can be sub divided into Fixed Overhead Expenditure Variance and Fixed Overhead Volume Variance.

Fixed Overhead Expenditure Variance: Fixed Overhead Expenditure Variance is that portion of the fixed overhead variance which is due to the difference between the budgeted fixed overheads and the actual fixed overheads incurred during a particular period. The derivation may be expressed as:

Fixed Overhead Expenditure Variance	=	Budgeted Fixed Overheads – Actual Fixed Overheads Or AU × (SR - AR)

Expenditure variance may arise on account of rise in general price level, changes in production methods, ineffective control, etc.

Fixed Overhead Volume Variance: Fixed Overhead Volume Variance is that portion of the fixed overhead variance which arises due to the difference between the standard cost of fixed overhead allowed for the actual output and the budgeted fixed overheads for the period during which the actual output has been achieved. The derivation may be expressed as:

Fixed Overhead Volume Variance	=	Standard Rate (Actual Units - Budgeted Units) Or SR (AU – BU)

Volume variance shows the over or under absorption of fixed overheads during a particular period. If the actual output is more than the budgeted output, there is over-recovery of fixed overheads and volume variance is favourable and vice versa if the actual output is less than the budgeted output. This is so because fixed overheads are not expected to change with the change in output. Volume variance can be further subdivided into Capacity Variance, Calendar Variance and Efficiency Variance.

Capacity Variance: Capacity Variance is that portion of the volume variance which is due to working at higher or lower capacity than the budgeted capacity. In other words, this variance is related to the under and over utilisation of plant and equipment and arises due to idle time, strikes and lock-out, break-down of the machinery, power failure, shortage of materials and labour, absenteeism, overtime, changes in number of shifts. In short, the variance arises due to more or less working hours than the budgeted working hours. The derivation may be expressed as:

Fixed Overhead Capacity Variance	=	Standard Fixed Overhead Rate per Unit × (Budgeted Units – Actual Units)

Calendar Variance: Calendar Variance is that portion of the volume variance which is due to the difference between the number of working days in the budget period and the number of actual working days in the period to which the budget is applicable. If the actual working days are more than the standard working days, the variance will be favourable and vice versa if the actual working days are less than the standard days. The derivation may be expressed as:

Fixed Overhead Calendar Variance	=	Standard Rate Per Hour or Per Day × Excess or Deficit Hours or Days Worked

Fixed Overhead Efficiency Variance: Fixed Overhead Efficiency Variance is that portion of the volume variance which is due to the difference between the budgeted efficiency of production and the actual efficiency achieved. This variance is related to the efficiency of workers and plant. The derivation may be expressed as:

Fixed Overhead Efficiency Variance	=	Standard Rate per Unit × (Actual Production in Units – Standard Production in Units) or SR × (AU – SU)

Reporting of Variances

In order that variance reporting should be effective, it is essential that the following requisites are fulfilled:

1. The variances arising out of each factor should be correctly segregated. If any part of a variance due to one factor is wrongly attributed to or merged with that of another, the report submitted to the management would be misleading and wrong conclusions may be drawn from it.
2. Variances, particularly the controllable variances, should be reported with promptness as soon as they occur. Mere operation of Standard Costing and reporting of variances is of no avail. The success of a Standard Costing system depends on the extent of responsibility which the management assumes in correcting the conditions which cause variances from standard. In order to assist the management in assuming this responsibility, the variances should be reported frequently and on time. This would enable corrective action being taken for future production while work is in progress and before the project or job is completed.
3. For effective control, the line of organisation should be properly defined and the authority and responsibility of each individual should be laid down in clear terms. This will avoid 'passing on the buck' and shirking of responsibility and will enable the tracing of the causes of variances to the appropriate levels of management.
4. In certain cases, a particular variance may be the joint responsibility of more than one individual or department. It is obvious that if corrective action has to be effective in such cases, it should be taken jointly.
5. Analysis of uncontrollable variances should be made with the same care as for controllable variances.

Though a particular variance may not be controllable at the lower level of management, a detailed analysis of the off-standard situation may reveal far reaching effects on the economy of the concern. This should compel the top management to take corrective action, say, by changing the policy which gave rise to the uncontrollable variance.

Forms of Variance Reports:

The forms of reports for the different types of variances should be designed keeping in view the needs of the management and the size of the concern, and no standard forms are, therefore, suggested. Variance Analysis Reports prepared for the top management would obviously be more formal and would contain broad details only, while those meant for presentation to the lower levels would contain details showing the causes of each variance and the specific responsibilities of the individuals concerned.

5.1.6 Activity Ratios

Although absolute monetary terms show the extent of the variances, the information is insufficient if the management wants to study the trend of variances from period to period. Absolute figures in themselves do not give the full picture and it is only by comparison of one item with another that their correct relationship is obtained. Variance Ratios serve this need and comparison of these ratios from one period to another can be gainfully made. Another advantage of Variance Ratio is in regard to its applicability in the dual plan of standard cost accounting. With the help of the Cost Variance Ratios, standard costs of production and the standard values of inventory can be easily converted into actual costs for the purpose of incorporation in the financial accounts.

A number of ratios are used for reporting to the management with respect to the effective use of capacity, material, labour and other resources. Some of these are listed below:

1. Efficiency Ratio.
2. Activity Ratio.
3. Calendar Ratio.
4. Capacity Usage Ratio
5. Capacity Utilization Ratio.
6. Idle Time Ratio.

1. **Efficiency Ratio:** Efficiency ratio reveals the input-output relationship. Input is available in terms of hours worked. Output is converted into standard hours to determine the relationship of input and output.

Efficiency Ratio	=	(Standard Hours ÷ Actual Hours) × 100

It is a very important ratio and it reveals the extent of efficiency or inefficiency of production during the related period. The student should bear in mind that standard hour is the media of expressing output in terms of hours. It can be referred to as a hypothetical hour which measures the amount of work which should be performed in one hour according to standard.

2. **Activity Ratio:** Activity Ratio is the number of standard hours equivalent to the output produced, expressed as a percentage of the budgeted standard hours.

Activity Ratio	=	(Standard Hours for Actual Work ÷ Budgeted Standard Hours) × 100

The following three steps are involved in determining this ratio:

a. Actual output should be expressed in terms of standard hours.

b. Budgeted output should be expressed in standard hours.

c. Percentage relationship of (a) and (b) should be expressed.

This ratio highlights the actual level of activity in comparison to budgeted activity level. This ratio reveals how effectively or ineffectively actual efforts were made in comparison to budgeted estimates.

3. **Calendar Ratio:** Calendar Ratio is the relationship between the number of working days in a period and the number of working days in the relative budget period.

Calendar Ratio	=	(Actual Working Days ÷ Budgeted Working Days) × 100

Calendar ratio indicates whether all the budgeted working days in a budgeted period have been available in actual practice. If the ratio is more than 100% actual working days are more than the budgeted working days and vice versa.

4. **Capacity Usage Ratio:** Capacity Usage Ratio is the relationship between the budgeted number of working hours and the maximum possible number of working hours in a budget period.

Capacity Usage Ratio	=	(Budgeted Hours ÷ Maximum Possible Hours in Budget) × 100

Capacity usage ratio indicates the extent to which the budgeted hours have actually been utilised.

1. **Capacity Utilisation Ratio:** It is the relationship between actual hours in a budget period and the budgeted working hours in the period.

Capacity Utilisation Ratio	=	(Actual Hours ÷ Budgeted Hours) × 100

2. **Idle Time ratio:** It is the ratio of idle time hours to the total hours budgeted.

Idle Time ratio	=	(Idle Time Hours ÷ Budgeted Hours) × 100

Example 3

Product X takes 5 hours to make and Product Y requires 10 hours. In a month of 25 effective days of 8 hours a day, 1,000 units of X and 600 units of Y were produced. The company employs 50 workers in the production department, and the budgeted hours for the year are 102,000.

Required: Calculate the following control ratios:

(a) Efficiency ratio

(b) Activity ratio

(c) Capacity ratio

Solution:

Standard Hours = (1000 units of X × 5 hours) + (600 units of Y × 10 hours)

= 5,000 + 6,000 = 11,000

Actual Hours = 25 days × 8 hours × 50 workers = 10,000

Budgeted Hours for the Month = (1,02,000 ÷12) = 8,500

(a) Efficiency Ratio

= (Standard Hours ÷ Actual Hours) × 100

= (11,000 ÷ 10,000) × 100 = 110%

(b) Activity Ratio

= (Standard Hours for Actual Work ÷ Budgeted Standard Hours) × 100

= (11,000 ÷ 8,500) × 100 = 129.41%

(c) Capacity Ratio = (Actual Hours ÷ Budgeted Hours) × 100

= (10,000 ÷ 8,500) = 117.65%

Observation: All the ratios are greater than 100%. The performance may be considered as better than the benchmarks.

5.1.7 Application of Budgetary Control and Standard Costing in Profit Planning

Profit Planning

Profit is considered as a significant element of a business activity. According to Peter Drucker, "profit is a condition of survival. It is the cost of the future, the cost of staying in a business." Therefore, profit should be planned and managed properly. An organisation should plan profits by taking into consideration its capabilities and resources. Profit planning lays foundation for the future income statement of the organisation.

Profit Planning aims to set a profit objective for a budgeting period. Also, it seeks to establish the main policy decisions regarding how to achieve the objectives. The profit objectives, in principle, reflect the expected return on capital employed. In profit planning, alternatives are evaluated to select the most likely option that will yield the required profit objective. Managers can plan their budgets on this basis.

There are several outputs that may be expected from any profit planning exercise. These include:

- Setting the profit objectives for the budget period
- Specifying the policy decisions and course of action to be followed during the budget period
- Providing planning directives for the preparation of detailed operating plans

The key factors that are considered in profit planning are:

- Changes needed in volume, price, and cost
- Availability of funds for investment
- Capital expenditure proposals
- Changes needed in the level of working capital
- Limits on discretionary expenditure (e.g., research and development)
- Return Required on Capital Employed

The end result of this process is a statement of the profit objective and how it is to be achieved. This statement is the starting point for budgeting.

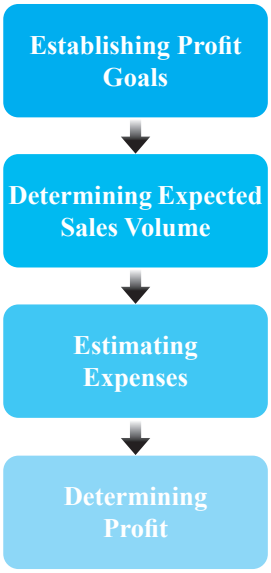
The steps involved in profit planning process may be stated as follows:

i. Establishing Profit Goals

ii. Determining Expected Sales Volume

iii. Estimating Expenses

iv. Determining Profit



Establishing Profit Goals: Implies that profit goals should be set in alignment with the strategic plans of the organisation. Moreover, the profit goals of an organisation should be realistic in nature based on the capabilities and resources of the organisation.

Determining Expected Sales Volume: Constitutes the most important step of the profit planning process. An organisation needs to forecast its sales volume so that it can achieve its profit goals. The sales volume can be anticipated by taking into account the market and industry trends and performing competitive analysis.

Estimating Expenses: Requires that an organisation needs to estimate its expenses for the planned sales volume. Expenses can be determined from the past data. If an organisation is new, then the data of similar organisation in same industry can be taken. The expense forecasts should be adjusted to the economic conditions of the country.

Determining Profit: Helps in estimating the exact value of profit. Estimated profit is calculated as excess projected income over projected expenses.

After planning the profit successfully, an organisation needs to control profit. Profit control involves measuring the gap between the estimated level and actual level of profit achieved by an organisation. If there is any deviation, the necessary corrective measures are taken by the organisation. Profit control, thus, involves continuous and concurrent comparison of the actuals with the estimates and initiating timely corrective actions. And this is where standard costing as also budgetary control fit in as important tools in profit planning.

Advantages of Standard Costing:

Standard Costing can be used for projecting the profit level of the business at any level of production. It is quite useful to the management in its functions of planning, controlling performance evaluation and decision making. The advantages derived from a system of standard costing may be stated as:

1. Standard Costing system establishes yard-sticks against which the efficiency of actual performances is measured.
2. The standards provide incentive and motivation to work with greater effort and vigilance for achieving the standard performance. This increases efficiency and productivity all round.
3. At the very stage of setting the standards, simplification and standardisation of products, methods, and operations are ensured and waste of time and materials is eliminated. This assists in managerial planning for efficient operation and benefits all the divisions of the concern.
4. Costing procedure is simplified. There is a reduction in paper work in accounting and a smaller number of forms and records are required.
5. Costs are available with promptitude for various purposes like fixation of selling prices, pricing of inter-departmental transfers, ascertaining the value of costing stocks of work-in-progress and finished stock and determining idle capacity.
6. Standard Costing is an exercise in planning - it can be very easily fitted into and used for budgetary planning.
7. Standard Costing system facilities delegation of authority and fixation of responsibility for each department or individual. This also tones up the general organisation of the concern.
8. Variance analysis and reporting is based on the principles of management by exception. The top management

may not be interested in details of actual performance but only in the variances form the standards, so that corrective measures may be taken in time. When constantly reviewed, the standards provide means for achieving cost reduction.

9. Standard costs assist in performance analysis by providing ready means for preparation of information.
10. Production and pricing policies may be formulated in advance before production starts. This helps in prompt decision-making.
11. Standard costing facilitates the integration of accounts so that reconciliation between cost accounts and financial accounts may be eliminated.
12. Standard Costing optimizes the use of plant capacities, current assets and working capital.

Limitations of standard costing:

1. Establishment of standard costs is difficult in practice.
2. In course of time, sometimes even in a short period the standards become rigid.
3. Inaccurate, unreliable and out of date standards do more harm than benefit.
4. Sometimes, standards create adverse psychological effects. If the standard is set at high level, its non-achievement would result in frustration and build-up of resistance.
5. Due to the play of random factors, variances cannot sometimes be properly explained, and it is difficult to distinguish between controllable and non-controllable expenses.
6. Standard costing may not sometimes be suitable for some small concerns. Where production cannot be carefully scheduled, frequent changes in production conditions result in variances. Detailed analysis of all of which would be meaningless, superfluous and costly.
7. Standard costing may not, sometimes, be suitable and costly in the case of industries dealing with non- standardized products and for repair jobs which keep on changing in accordance with customer's specifications.
8. Lack of interest in standard costing on the part of the management makes the system practically ineffective. This limitation, of course, applies equally in the case of any other system which the management does not accept wholeheartedly.

Budgets and Budgetary Control:

A budget is a profit plan reflecting anticipated financial inflows and outflows. Budgeting helps all sorts of entities to plan and control their operations, and to support their managerial strategies. A budget sets out the benchmark against which performance will be measured. The main purposes of budgeting may be summed up as aiding the achievement of strategic plans by:

a. Translating the long-term plans into an annual workable budget;
b. Communicating the plans to those who will be held accountable;
c. Coordinating with the various departments of the organisation to ensure that they are working in harmony; and
d. Controlling the performance by continuous monitoring of the actual results with the budget and initiating timely corrective measures.

Put in a nut shell, the role of the budget is to give focus to an organisation, help the co-ordination of activities and enable control.

Advantages of the Budgetary Control System:

1. The use of budgetary control system enables the management of a business concern to conduct its business activities in the efficient manner.
2. It is a powerful instrument used by business houses for the control of their expenditure. It, in fact, provides a yardstick for measuring and evaluating the performance of individuals and their departments.
3. It reveals the deviations to management, from the budgeted figures after making a comparison with actual figures.
4. Effective utilization of various resources like-men, material, machinery and money is made possible, as the production is planned after taking them into account.
5. It helps in the review of current trends and framing of future policies.
6. It creates suitable conditions for the implementation of standard costing system in a business organisation.
7. It inculcates the feeling of cost consciousness among workers.

Limitations of the Budgetary Control System:

1. **Estimates:** Budgets may or may not be true, as they are based on estimates. The assumptions about future events may or may not actually happen.
2. **Rigidity:** Budgets are considered as rigid documents. Too much emphasis on budgets may affect day-today operations and ignores the dynamic state of organisational functioning.
3. **False Sense of Security:** Mere budgeting cannot lead to profitability. Budgets cannot be executed automatically. It may create a false sense of security that everything has been taken care of in the budgets.
4. **Lack of co-ordination:** Staff co-operation is usually not available during Budgetary Control exercise.
5. **Time and Cost:** The introduction and implementation of the system may be expensive.

Assimilation: Both standard costing and budgetary control aim at the objective of maximum efficiency and managerial control.

5.1.8 Standard Costing vs Budgetary Control

Standard Costing: Standard Costing is a control technique that reports variances by comparing actual costs to pre-set standards thereby facilitating action through management by exception. A standard is a stipulated norm, something set up and established by an authority as a rule for the measure of quantity, weight, extent, value, or quality. Standards are set based on predetermined physical inputs of materials, labour, machine hours, power and other resources which should be consumed while manufacturing a product. Accordingly, standard costs stand for predetermined costs; they are the target costs, which should be incurred under the normative operating conditions.

In standard costing system, the standard costs for the standard and the actual output for a particular period are traced to the functional managers who are responsible for the various operations of a responsibility centre. The actual costs for the same period are also traced to the same responsibility centre. The two costs, the standard and the actual, are then compared and the variance between the two is analysed and reported to the cost controllers. The designated controllers keep initiating corrective actions, wherever needed on a continuous basis. The system, thus, facilitates not only concurrent monitoring, but as also concurrent control of costs whereby competitive advantage is gained. In principle, Standard Costing is Engineered Costing.

Budgetary Control: Budgetary Control is the process that facilitates effective implementation of the budgets. The process allows continuous monitoring of actual results versus budget, either to secure by individual action the

budget objectives or to provide a basis for budget revision. Budgetary control refers to how well managers utilize budgets to monitor and control costs and operations in a given budget period. In other words, budgetary control is a process for managers to set financial and performance goals with budgets, compare the actual results, and adjust performance, as it is needed.

Budget Centres provide a convenient means to exercise control on budgets. Budget Centre is often a responsibility centre where the manager has authority over, and responsibility for, defined costs and (possibly) revenues. Budgetary Control is the process whereby Budgets enable in authorising expenditure, communicating objectives and plans, controlling operations, co-coordinating activities, evaluating performance, planning and rewarding performance. Often, reward systems involve comparison of the actual with the budgeted performance.

Budget aids the planning of actual operations by forcing managers to consider how the conditions might change and what steps should be taken to prevent the problems before they arise. It also helps to co-ordinate the activities of the organisation by compelling managers to examine relationships between their own operations and those of other departments.

Similarities: Both Standard Costing and Budgetary Control are based on the principle that costs can be controlled along certain lines of supervision and responsibility and focus on controlling costs by comparing actual performance with the predefined parameters. However, the two systems are neither similar nor interdependent. Standard Costing delineates the variances between actual cost and the standard cost, along with the reasons. On the contrary, Budgetary Control comprises the creation of budgets, then comparing the actual output with the budgeted one and taking corrective action immediately. Similarity between Standard Costing and Budgetary Control are as follows:

i. Both aim at the determination of cost in advance.

ii. For both of them predetermined benchmarks are fixed.

iii. In both of them actual costs are compared with the benchmarks.

iv. Both require periodic cost reports.

v. Both aim at the maximum efficiencies and managerial costs.

Key Differences: Similarities apart, Standard Costing and Budgetary Control differ in scope and technique. The following are the major differences between standard costing and budgetary control:

1. Standard Costing is a cost accounting system, in which performance is measured by comparing the actual and standard costs. Budgetary Control is a control system in which actual and budgeted results are compared continuously in order to achieve the desired results.
2. Standard Costing has a restricted scope, limited to costs only, whereas Budgets are complete in as much as they are framed for all the activities and functions of a concern such as production, purchase, selling and distribution, research and development, capital utilisation, etc.
3. Standard costing is a unit concept whereas budgetary control is a total concept.
4. Budgets are the ceilings or limits of expenses above which the actual expenditure should not normally rise; if it does, the planned profits will be reduced. Standards are minimum targets to be attained by actual performance at specified efficiency.
5. A more searching analysis of the variances from standards is necessary than in the case of variations from the budget.
6. Budgets are indices, adherence to which keeps a business out of difficulties. Standards are pointers to further possible improvements.

7. Standard costs do not change due to short-term changes in the conditions, but budgeted costs may change.
8. A system of Budgetary Control may be operated even if no Standard Costing system is in use in the concern.

Assimilation: Accurate cost information is fundamental to budgeting. Companies that use accurate cost management techniques and provide budget developers with ready access to cost information improve both the accuracy and the speed of their budget process. Standardizing the cost management system entity-wide is an important step in improving the link between cost management and budgeting. As such, Standard Costing facilitates better budgetary control.

5.1.9 Reconciliation of Actual Profit with Standard Profit and /or Budgeted Profit

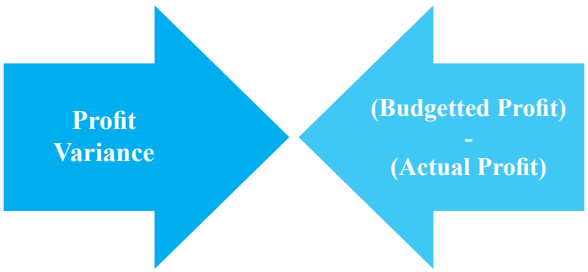
Profit

Profit reflects the financial gains wherein benefits derived from a business activity exceed the costs. Profit, therefore, is considered as the bottom-line for every entrepreneurial activity. Actual profit reflects the actual accruals, budgeted profit reflects the budgeted accruals and the standard profit refers to the normative accruals.

There could be multiple reasons for actual profit being different from the budgeted or standard profit. Some of the reasons may be listed as:

i. Differences between actual and expected units of sales
ii. Differences between actual and expected product pricing
iii. Changes in the cost of materials
iv. Changes in labour costs
v. Changes in the amount of overhead costs incurred
vi. Changes in the amount of scrap and wastages
vii. And so on.

Profit Variance: Profit Variance is the difference between planned, budgeted or standard profit vis-à-vis the actual profit attained. In practical usage it represents the difference between budgeted profit and actual profit. Profit Variance can be subdivided into Profit Price Variance and Profit Volume Variance.



Profit Price Variance: Profit Price Variance is calculated with reference to the turnover. It represents the difference of standard and actual profit on actual volume of sales. The formula is:

Profit Price Variance	=	(Actual Quantity Sold) × (Standard Rate of Profit - Actual Rate of Profit)

Profit Volume Variance: Profit Volume Variance denotes the difference between the standard quantity of the

output vis-à-vis the actual quantity, both at standard price. The profit at the standard rate on the difference between the standard and the actual volume of sales would be the amount of volume variance. The formula is:

Profit Volume Variance	=	(Budgeted Profit – Standard profit) = (Standard Rate of Profit) × (Budgeted Quantity - Actual Quantity)

Profit Volume Variance can be subdivided into Mix Variance and Quantity Variance.

Profit Volume Mix Variance: When more than one product is manufactured and sold, the difference in profit can result because of the variation of actual mix and budgeted mix of sales. The difference between revised standard profit and the standard profit is the mix variance. The formula is:

Profit Volume Mix Variance = Revised Standard Profit – Standard Profit

Profit Volume Quantity Variance: It results from the variation in profit because of difference in actual quantities sold and the budgeted quantities both taken in the same ratio. The actual quantities are to be revised in the ratio of standard mixture. The formula is:

Profit Volume Quantity Variance = Budgeted Profit – Revised Standard Profit

Reconciliation

Reconciliation refers to the action of making one view or belief compatible with another. The purpose of calculating variances is to identify the diverse reasons for the deviations and to analyse the effect of each item of cost or income on actual profit in comparison to the expected profit. Reconciliation of actual profit with the standard or budgeted profit, therefore, throws of the causes of variance and facilitates corrective steps.

Illustration 4

In a company operating on a standard costing system for a given four-week period budgeted sales of 10,000 units at ₹ 50 per unit, actual sales were 9,000 units at ₹ 51.25 per unit. Costs relating to that period were as follows:

	Standard (₹)	Actuals (₹)
Materials	2,50,000	2,57,400
Wages	75,000	70,875
Fixed Overheads	20,000	18,810
Variable Overheads	10,000	9,250
Semi-Variable Overheads	2,700	2430
Standard Hours 50,000		
Actual Hours 40,500		

- The Standard material content of each unit is estimated at 25 kg. at ₹ 1 per kg, actual figures were 26 kg at ₹ 1.10 per kg.
- Semi-variable Overhead consists of FIVE - NINTHS fixed expenses and FOUR - NINTHS variable.
- The Standard wages per unit are 5 hours at ₹ 1.50, per Unit actual wages were 4.5 hours at ₹ 1.75.
- There were no opening stocks and the whole production for the period was sold.
- The four-week period was normal period.

You are required:

(a) To compute the variances in Sales, Materials, Labour and Over heads due to all possible causes; and

(b) With the help of such a computation draw a statement reconciling the actual profit for the period with the standard profit.

Solution:

Step 1: Segregation of Overheads

Element	Budget (₹)	Actual (₹)
Fixed Overhead	20,000	18,810
Share in Semi-Variable Overheads (5/9)	1,500	1,350
Total of Fixed Overheads	21,500	20,160
Variable Overheads	10,000	9,250
Share in Semi-Variable Overheads (4/9)	1,200	1,080
Total of Variable Overheads	11,200	10,330

Step 2: Computation of Variances:

(i) Sales Variances

(1)	(2)	(3)
AQAP	AQSP	SQSP
9000 × 51.25	9000 × 50	10000 × 50
₹ 4,61,250	₹ 4,50,000	₹ 5,00,000

AQAP = Actual value of sales = ₹ 4,61,250

AQSP = Actual sales at standard price = ₹ 4,50,000

SQSP = Standard value of sales = ₹ 5,00,000

(a) Sales Volume Variance = (AQSP - SQSP) = 50000 (A)

(b) Sales Price Variance = (AQAP – AQSP) =11250 (F)

(c) Sales Value Variance = (AQAP – SQSP) = 38750 (A)

(ii) Material Variances

AQ = 9000 × 26 = 234000

SQ = 9000 × 25 = 225000

(1)	(2)	(3)
SQSP	AQSP	AQAP
225000 × 1	234000 × 1	234000 × 1.1
2,25,000	2,34,000	2,57,400

SQSP = Standard cost of standard material = ₹ 225000

AQSP = Standard cost of actual material = ₹ 234000

AQAP = Actual cost of material = ₹ 257400

(a) Material Price Variance = (AQSP – AQAP) = 23400 (A)

(b) Material Usage Variance = (SQSP – AQSP) = 9000 (A)

(c) Material Cost Variance = (SQSP – AQAP) = 32400 (A)

(iii) Labour Variances

SH = 9000 units × 5 hours per unit= 45000

AH = ₹ 70,875 ÷ 1.75 per hour = 40,500

(1)	(2)	(3)
SRSH	SRAH	ARAH
1.5 × 45000	1.5 × 40500	1.75 × 40500
₹ 67500	₹ 60750	₹ 70875

SRSH = Standard cost of standard labour = ₹ 67500

SRAH = Standard cost of actual labour = ₹ 60750

ARAH = Actual cost of labour = ₹ 70875

(a) Labour Efficiency Variance = (SRSH – SRAH) = ₹ 6750 (F)

(b) Labour Rate Variance = (SRAH - ARAH) = ₹ 10125 (A)

(c) Labour Cost Variance = (SRSH - ARAH) = ₹ 3375 (A)

(iv) Variable Overhead Variances

SR = 11200 ÷ 50000 = ₹ 0.224

(1)	(2)	(3)
SRSH	SRAH	ARAH
0.224 × 45000	0.224 × 40500	10330
₹ 10080	₹ 9072	₹ 10330

SRSH = Standard cost of standard variable overheads = ₹ 10080

SRAH = Standard cost of actual variable overheads = ₹ 9072

ARAH = Actual cost of variable overheads = ₹ 10330

(a) Variable Overheads Efficiency Variance = (SRSH – SRAH) = ₹ 1008 (F)

(b) Variable Overheads Budget Variance = (SRAH – ARAH) = ₹ 1258 (A)

(c) Variable Overheads Cost Variance = (SRSH – ARAH) = ₹ 250 (A)

(v) Fixed Overhead Variances

SR = 21500 ÷ 50000 = ₹ 0.43

(1)	(2)	(3)	(4)
SRSH	SRAH	SRBH	ARAH
0.43 × 45000	0.43 × 40500	0.43 × 50000	
₹ 19350	₹ 17415	₹ 21500	₹ 20160

SRSH = Standard cost of standard fixed overheads = ₹ 19350

SRAH = Standard cost of actual fixed overheads = ₹ 17415

SRBH = Budgeted fixed overheads = ₹ 21500

ARAH = Actual fixed overheads = ₹ 20160

(a) Fixed Overheads Efficiency Variance = (SRSH – SRAH) = ₹ 1935 (F)

(b) Fixed Overheads Capacity Variance = (SRAH - SRBH) = ₹ 4085 (A)

(c) Fixed Overheads Volume Variance = (SRSH – SRBH) = ₹ 2150 (A)

(d) Fixed Overheads Budget Variance = (SRBH – ARAH) = ₹ 1340 (F)

(e) Fixed Overheads Cost Variance = (SRSH – ARAH) = ₹ 810 (A)

Step 3: Reconciliation

(i) Statement of Profit

Serial	Particulars	Amount (₹)		
		Budget	Standard for Actual Quantity	Actual
A	Sales			
	1. Number of Units	10,000	9,000	9,000
	2. Selling Price per Unit	50.00	50.00	51.25
	3. Value of Sales	5,00,000	4,50,000	4,61,250
B	Costs			
	1. Material	2,50,000	2,25,000	2,57,400
	2. Wages	75,000	67500	70,875
	3. Variable Overheads	10,000	9,000	9,250
	4. Semi-Variable Overheads	2,700	2,430	2,430
	5. Fixed Overheads	20,000	18,000	18,810
	6. Total Cost	3,57,700	3,21,930	3,58,765
C	Profit (A – B)	1,42,300	1,28,070	1,02,485

Notes: Standard costs for actual quantity of sales (at actual price) have been calculated in the ratio of 9,000 to 10,000.

Working note:-

Calculation of standard for actual quantity of-

variable overhead = (10,000/50,000) × 45,000 = 9,000

semi-variable overheads = (2,700/50,000) × 45,000 = 2,430

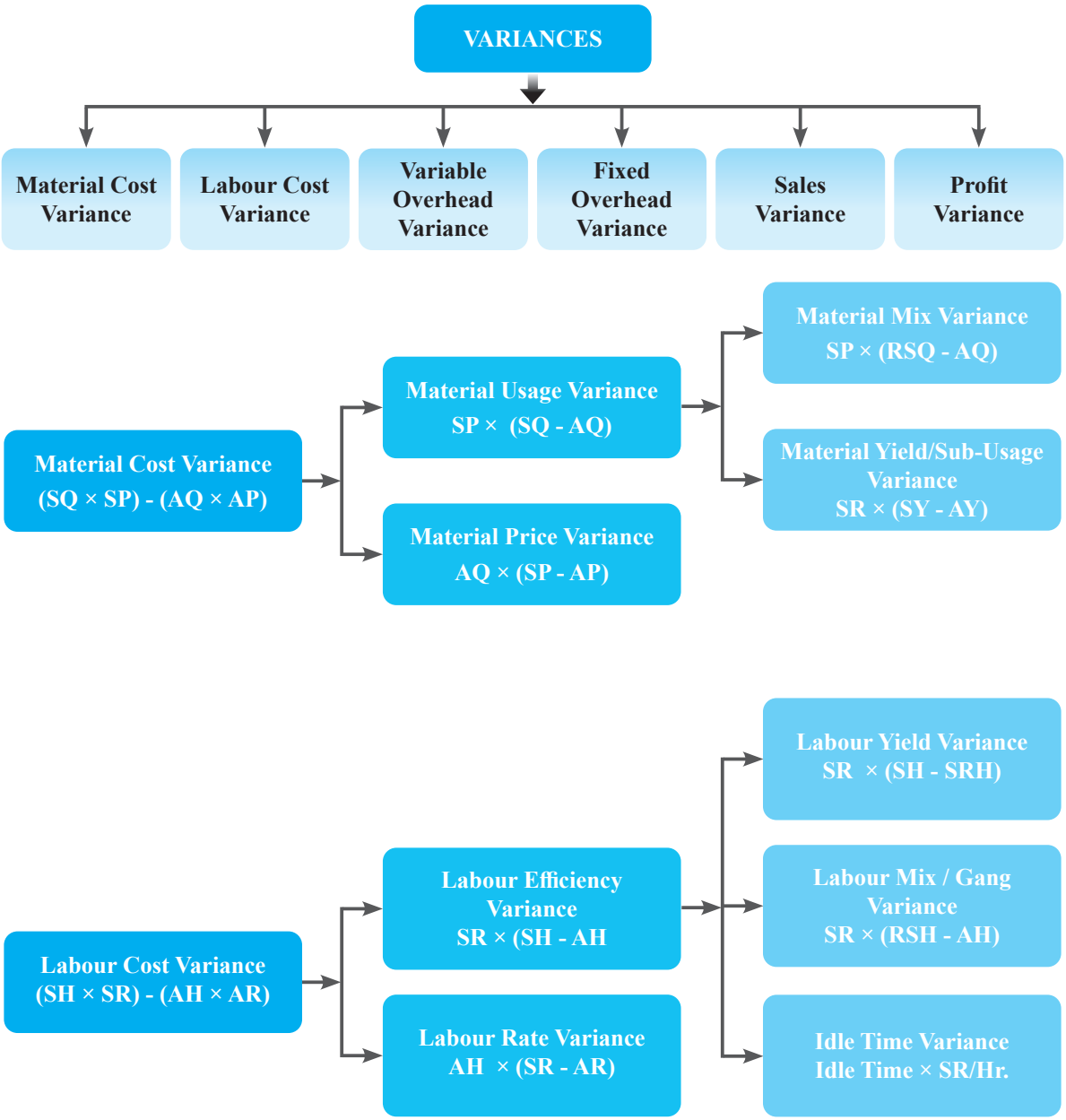
Fixed overhead = (20,000/50,000) × 45,000 = 18,000

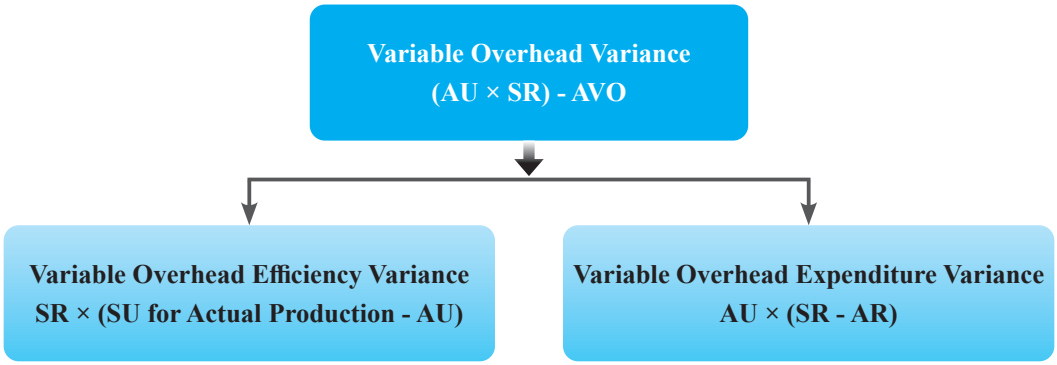
(ii) Statement showing reconciliation of Budgeted Profit, Standard Profit and Actual Profit

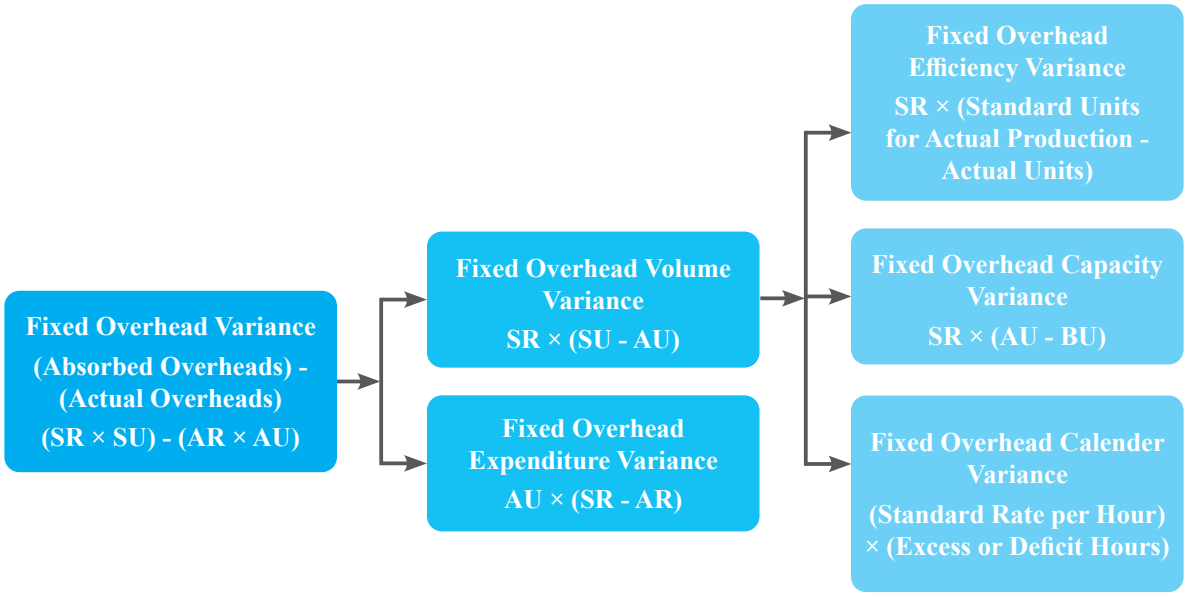
Element	₹	₹
Budgeted Sales		5,00,000
Budgeted Costs		3,57,700
Budgeted Profit		1,42,300
(-) Sales Volume Variance	(50,000)	
(+) Diff. in Budgeted Costs & Standard Costs for Actual Quantity	35,770	(14,230)
Standard Profit for Actual Quantity		1,28,070
Add: Favourable Variances		
Sales Price Variance	11,250	
Labour Efficiency variance	6,750	
Variable Overhead Efficiency Variance	1,008	
Fixed Overhead Efficiency Variance	1,935	
Fixed Overhead Budget Variance	1,340	22,283
Less: Adverse Variances		
Material Usage Variance	9,000	
Material Price Variance	23,400	
Labour Rate Variance	10,125	
Variable Overhead Budget Variance	1,258	
Fixed Overhead Capacity Variance	4,085	47,868
Actual Profit		1,02,485

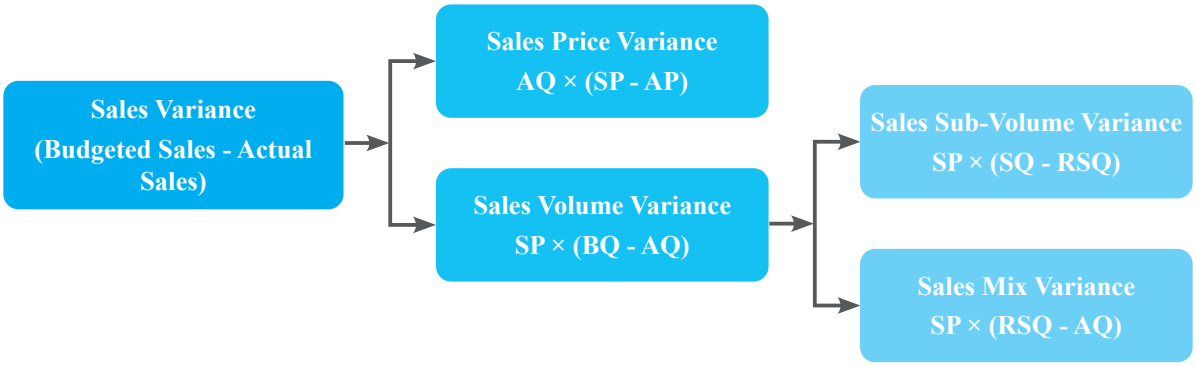
Take-home Pack: The illustration clearly demonstrates the multiple reasons that could lead to variances between the budgets, standards and actuals. The reconciliation serves as a tool whereby efforts can be focused on the areas that warrant attention. Variance Analysis is a concept of 'Management by Exception'. The kinds and sorts of variances discussed in this module are conceptual in nature. Scope always does exist to carve out one more type of variance that would serve one more need. In the ultimate, it is the wisdom of decision makers that ensures effective application.

Overview of Variances with Formulae




Variable Overhead Variance
(AU × SR) - AVO
Variable Overhead Efficiency Variance
SR × (SU for Actual Production - AU)
Variable Overhead Expenditure Variance
AU × (SR - AR)


Fixed Overhead Variance
(Absorbed Overheads) - (Actual Overheads)
(SR × SU) - (AR × AU)
Fixed Overhead Volume Variance
SR × (SU - AU)
Fixed Overhead Expenditure Variance
AU × (SR - AR)
Fixed Overhead Efficiency Variance
SR × (Standard Units for Actual Production - Actual Units)
Fixed Overhead Capacity Variance
SR × (AU - BU)
Fixed Overhead Calender Variance
(Standard Rate per Hour) × (Excess or Deficit Hours)


Sales Variance
(Budgeted Sales - Actual Sales)
Sales Price Variance
AQ × (SP - AP)
Sales Volume Variance
SP × (BQ - AQ)
Sales Sub-Volume Variance
SP × (SQ - RSQ)
Sales Mix Variance
SP × (RSQ - AQ)

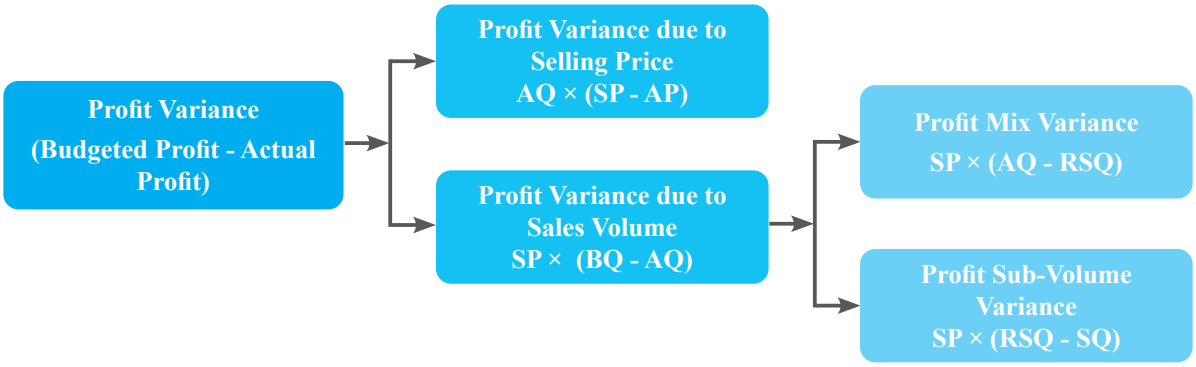


Illustration 5

S.V.Ltd. manufactures BXE by mixing three raw materials. For every batch of 100Kg. of BXE, 125 Kg. of raw materials are used. In April 2021, 60 batches were prepared to produce an output of 5,600 Kg. of BXE. The standard and actual particulars for April 2024 are as under:

	Standard		Actual		
Raw material	Mix %	Price per kg	Mix %	Price per kg	Quantity of raw materials purchased kg
A	50	20	60	21	5,000
B	30	10	20	8	2,000
C	20	5	20	6	1,200

Calculate relevant material variances.

Solution:

Standard Production = (60 batches ×100 units per batch) = 6,000 units

Standard Raw Material for 6,000 units = (60 batches ×125 kg) = 7,500 kg

Standard Loss = (7,500 - 6,000) = 1,500 kg

Actual Production = 5,600 units

Standard Mix for 60 batches (i.e., 6,000 units)

Raw Material	Mix (%)	Quantity (Kg)	Price (₹)	Value (₹)
A	50	3,750	20	75,000
B	30	2,250	10	22,500
C	20	1,500	5	7,500
Total		7,500		1,05,000
Standard Loss @ 25 kg per batch		60 × 25 = 1,500		
Production		6,000		1,05,000

Standard Mix for Actual Production of 5,600 units

Raw Material	Mix (%)	Quantity (Kg)	Standard Price (₹)	Value (₹)
A	50	3,500	20	70,000
B	30	2,100	10	21,000
C	20	1,400	5	7,000
Total		7,000		98,000

Actual Mix for 5,600 units

Raw Material	Mix (%)	Quantity (Kg)	Standard Price (₹)	Actual Price (₹)	Standard Value (₹)	Actual Value (₹)
A	60	4,500	20	21	90,000	94,500
B	20	1,500	10	8	15,000	12,000
C	20	1,500	5	6	7,500	9,000
Total		7,500			1,12,500	1,15,500
Actual Loss = 7,500 – 5600		1,900				
Production		5,600			1,12,500	1,15,500

Note: Purchased quantity is 8,200 kg; but consumed quantity is only 7,500 kg.

Material Cost Variance = Standard Cost – Actual Cost

= 98,000 – 1,15,500 = ₹ 17,500 (A)

Material Price Variance = AQ (SP-AP) = (1,12,500 - 1,15,500) = ₹ 3,000 (A)

Material Yield Variance = (Standard Price of Standard Mix for Actual Production

– Standard Price of Standard Mix for Standard Production)

= (98,000 – 1,05,000) = ₹ 7,000 (A)

Material Mix Variance = Standard Price of Standard Mix for Standard Production – Standard Price of Actual Mix for Actual Production

= (1,05,000 – 1,12,500) = ₹ 7,500 (A)

Illustration 6

A brass foundry making castings which are transferred to the machine shop of the company at standards in regard to material stocks which are kept at standard price are as follows:

Standard Mixture 70% Material C; 30% Material Z

Standard Price Material C ₹ 2,400 per ton; Material Z ₹ 650 per ton

Standard loss in melting 5% of input

Figures in respect of a costing period are as follows:

Commencing stocks	Material C	100 tons	
	Material Z	60 tons	
Finishing stocks	Material C	110 tons	
	Material Z	50 tons	
Purchases	Material C	300 tons	Cost ₹ 7,32,500
	Material Z	100 tons	Cost ₹ 62,500
Metal melted	400 tons		
Casting produced	375 tons		

Present figures showing: Material Price, Mixture, and Yield Variance.

Solution:

Description	Material C		Material Z	
	Quantity	Value	Quantity	Value
Opening Stock at Standard Price	100	240000	60	39000
(+) Purchases (Actuals)	300	732500	100	62500
	400	972500	160	101500
(-) Closing Stock (Standard Price)	110	264000	50	32500
Consumption	290	708500	110	69000

	Standard			Actual		
	Qty.	Price	Value	Qty.	Price	Value
Material C	280	2400	672000	290		708500
Material Z	120	650	78000	110		69000
	400		750000	400		777500
(-) Standard Loss @ 5%	20			25		
	380		750000	375		777500

Standard Mix for Actual Production of 375 tons

Standard Consumption = (400 ÷ 380) × 375 = 394.737 tons

Raw Material	Mix (%)	Quantity (Tons)	Standard Price (₹)	Value (₹)
Material C	70	276.316	2400	6,63,158
Material Z	30	118.421	650	76,974
Total		394.736		7,40,132

SQSP = ₹ 7,40,132

RSQSP = ₹ 7,50,000

AQSP = 7,67,500

AQAP = (7,08,500 + 69,000) = 7,77,500

Material Price Variance = (AQSP – AQAP) = (7,67,500 – 7,77,500) = ₹ 10,000 (A)

Material Mix Variance= (RSQSP – AQSP) = (7,50,000 – 7,67,500) = 17500 (A)

Material Yield Variance = (SQSP – RSQSP) = (7,40,132 – 7,50,000) = 9868 (A)

Illustration 7

A company manufacturing a special type of fencing tile 12" × 8" × 1/2" used a system of standard costing. The standard mix of the compound used for making the tiles is:

1,200 kg. of material A @ ₹ 0.30 per kg.

500 kg. of Material B @ ₹ 0.60 per kg

800 kg. of Material C @ ₹ 0.70 per kg

The compound should produce 12,000 square feet of tiles of 1/2" thickness. During a period in which 1,00,000 tiles of the standard size were produced, the material usage was:-

Kg		₹
7,000	Material A @ ₹ 0.32 per kg.	2,240
3,000	Material B @ ₹ 0.65 per kg.	1,950
5,000	Material C @ ₹ 0.75 per kg.	3,750
15,000		7,940

Present the cost figures for the period showing Material price, Mixture, Sub-usage Variance.

Solution:

Step (i): Number of tiles for 12,000 sq ft.

Area of one tile =12" × 8" = 96" = (96÷144) sq ft = 2/3 sq ft

Number of tiles that can be laid in 12000 sq ft is {12000 ÷ (2/3)} = 18000

Step (ii): Standard and Actual Material for 1,00,000 tiles

Material	Standard Data			Actual Data		
	Quantity	Price	Value	Quantity	Price	Value
A	(1200 ÷ 18,000) × 1,00,000 = 6,666.67	0.30	2,000	7,000	0.32	2,240
B	(500 ÷ 18,000) × 1,00,000 = 2,777.77	0.60	1,667	3,000	0.65	1,950
C	(800 ÷ 18,000) × 1,00,000 = 4,444.44	0.70	3,111	5,000	0.75	3,750
Total	13,888.89		6,778	15,000		7,940

Step (iii): Revised Standard quantities (RSQ) for 1,00,000 tiles

RSQ for A = (15000÷13888.89) × 6666. 67 = 7200

RSQ for B = (15000÷13888.89) × 2777.77 = 3000

RSQ for C = (15000÷13888.89) × 4444.44 = 4800

Step (iv): Analysis of Computed Data

Material	SQSP	RSQSP	AQSP	AQAP
A		7,200 × 0.3 = 2,160	7,000 × 0.3 = 2,100	
B		3,000 × 0.6 = 1,800	3,000 × 0.6 = 1,800	
C		4,800 × 0.7 = 3,360	5,000 × 0.7 = 3,500	
Total	6,778	7,320	7,400	7,940

Step (v): Computation of Variances

a. Material Sub-Usage Variance = (SQSP – RSQSP) = (6778 - 7320) = ₹ 542(A)

b. Material Mix Variance = (RSQSP – AQSP) = (7320 - 7400) = ₹ 80(A)

c. Material Usage Variance = (SQSP – AQSP) = (6778 - 7400) = ₹ 622(A)

d. Material Price Variance = (AQSP-AQAP) = (7400 - 7940) = ₹ 540(A)

e. Material Cost Variance = (SQSP – AQAP) = (6778 – 7940) = ₹ 1162(A)

Check:

Material Usage Variance = (Material Sub-Usage Variance + Material Mix Variance)

i.e., 622(A) = 542(A)+ 80(A)

Material Cost Variance = (Material Usage Variance + Material Price Variance)

i.e., 1162(A) = 622(A) + 540(A)

Illustration 8

One kilogram of product 'K' requires two chemicals A and B. The following were the details of product 'K' for the month of June, 2021:

Standard mix Chemical 'A' 50% and Chemical 'B' 50%

Standard price per kilogram of Chemical 'A' ₹ 12 and Chemical 'B' ₹ 15

Actual input of Chemical 'B' 70 kilograms.

Actual price per kilogram of Chemical 'A' ₹ 15

Standard normal loss 10% of total input.

Materials Cost variance total ₹ 650 adverse.

Materials Yield variance total ₹ 135 adverse.

You are required to calculate:

Materials mix variance total

Materials usage Variance total

Materials price variance total

Actual loss of actual input

Actual input of chemical 'A'

Actual price per kilogram of Chemical 'B'

Solution:

Let, actual input of chemical A be 'a' kgs

Actual price per Kg of chemical B be ₹ 'b'

Standard input be 100Kgs

Actual output be 90Kgs

	Standard			Actual		
	Qty.	Price	Value	Qty.	Price	Value
A	50	12	600	a	15	15a
B	50	15	750	70	b	70b
	100		1350	70 + a		15a + 70b
(-) Normal loss	10	--	--	(70 + a) -90 = a -20	--	--
	90		1350	90		15a + 70b

	(1)	(2)	(3)	(4)
	SQSP	RSQSP	AQSP	AQAP
A		12 × (70 + a) × 50% = 420 + 6a	12 × a	
B		15 × (70 + a) × 50% = 525 +7.5a	15 × 70	
	1350	945 + 13.5a	1050 + 12a	15a + 70b

Given Material Cost Variance

= (SQSP – AQAP) = [1350 – (15a + 70b)] = - 650

1350 -15a – 70b = -650

2000 = 15a +70b

15a + 70b = 2000

Given Material Yield Variance

= (SQSP – RSQSP = - 135

1350 – (945 +13.5a) = -135

405-13.5a = -135

540 = 13.5a

a = 40

15 a + 70 b = 2000

70 b = 2000 – 600 = 1400

b = 20

We, thus, have: a = 40 and b = 20

SQSP = ₹ 1350

RSQSP = 945 + (13.5 × 40) = ₹ 1485

AQSP = 1050 + (12 × 40) = ₹ 1530

AQAP = (15 × 40) + (70 × 20) = ₹ 2000

Material Mix Variance = (RSQSP- AQSP) = (1485 – 1530) = ₹ 45 (A)

Material Usage Variance = (SQSP- AQSP) = (1350 – 1530) = ₹ 180 (A)

Material Price Variance = (AQSP – AQAP) = (1530 – 2000) = ₹ 470 (A)

Actual loss of actual input = 20 Kgs

Actual input of chemical A = 40Kgs

Actual price per Kgs of chemical B = ₹ 20

Illustration 9

The standard labour component and the actual labour engaged in a week for a job are as under:

Particulars	Skilled workers	Semi-skilled workers	Unskilled workers
Standard no. of workers in a gang	32	12	6
Standard wage rate per hour (₹)	3	2	1
Actual no. of workers employed in the gang during the week	28	18	4
Actual wage rate per hour (₹)	4	3	2

During the 40-hour working week the gang produced 1800 standard labour hours of work. Calculate Labour efficiency variance, Mix variance, wage rate variance and labour cost variance.

Solution:

Step (i); Analysis of Given Data

Particulars	Standard Data			Actual Data		
	Hours	Rate	Value	Hours	Rate	Value
Skilled	32 × 40 = 1280	3	3840	28 × 40 = 1120	4	4480
Semi-Skilled	12 × 40 = 480	2	960	18 × 40 = 720	3	2160
Unskilled	6 × 40 = 240	1	240	4 × 40 = 160	2	320
Total	2000		5040	2000		6960

Step (ii): Computation of Standard Hours

Being given that during the 40-hour working week the gang produced 1800 standard labour hours of work (as against revised hours of 2000), we may find out the standard hours by adopting the formula:

$$\text{Standard Hours (SH)} = \left(\frac{\text{Standard Hours}}{\text{Total Std. Hrs}}\right) \times \text{Standard Hours for the Category}$$

$$\text{SH for Skilled Workers} = \frac{1800}{2000} \times 1280 = 1152$$

$$\text{SH for Semi-Skilled Workers} = \frac{1800}{2000} \times 480 = 432$$

$$\text{SH for Unskilled Workers} = \frac{1800}{2000} \times 240 = 216$$

Step (iii): Analysis of Computed Data

Particulars	SRSH	SRRSH	SRAH	ARAH
Skilled	3 × 1152 = 3456	3 × 1280 = 3840	3 × 1120 = 3360	4 × 1120 = 4480
Semi-Skilled	2 × 432 = 864	2 × 480 = 960	2 × 720 = 1440	3 × 720 = 2160
Unskilled	1 × 216 = 216	1 × 240 = 240	1 × 160 = 160	2 × 160 = 320
Total	4536	5040	4960	6960

Step (iv): Computation of Variances

Labour Mix Variance = (SRRSH – SRAH) = 5040 - 4960 = ₹ 80 (F)

Labour Efficiency Variance = (SRSH – SRAH) = (4536 – 4960) = ₹ 424 (A)

Labour Rate Variance = (SRAH – ARAH) = 4960 – 6960 = ₹ 2000 (A)

Labour Cost Variance = (SRSH – ARAH) = 4536 – 6960 = ₹ 2424 (A)

Illustration 10

DM is a denim brand specializing in the manufacture and sale of hand-stitched jeans trousers. DM manufactured and sold 10,000 pairs of jeans during a period. Information relating to the direct labour cost and production time per unit is as follows:

	Actual Hours Per Unit	Standard Hours Per Unit	Actual Rate Per Hour	Standard Rate Per Hour
Direct Labour	0.65	0.60	₹ 120	₹ 100

During the period, 800 hours of idle time was incurred. In order to motivate and retain experienced workers, DM has devised a policy of paying workers the full hourly rate in case of any idle time. Find out:

(a) Idle Time Variance

(b) Labour Efficiency Variance

Solution:

(a) Idle Time Variance:

Idle time variance = number of idle hours × standard rate

= 800 hours × ₹100 = ₹ 80,000 (A)

(b) Labour Efficiency Variance:

Total Hours = 10,000 units × 0.65 hours per unit = 6,500 hours.

Actual Hours (Active) = 6,500 hours - 800 idle hours = 5,700 hours.

Standard Hours = 10,000 units × 0.60 hours per unit = 6,000 hours.

Labour Efficiency Variance = Standard Rate × (Standard Hours – Actual Hours)

= (6,000 – 5700) × 100 = ₹ 30,000 (F)

Illustration 11

Calculate material and labour variances from the following:

Standard				Actual		
Input	Material	₹ /Kg	Total	Input	₹ /Kg	Total
400	A	@ 50	20,000	420	@ 45	18,900
200	B	@20	4,000	240	@ 25	6,000
100	C	@15	1,500	90	@15	1,350
700			25,500	750		26,250

	Labour Hours				Labour Hours		
	100 @ ₹ 20 Per hour	2000			120 Hrs. @ ₹ 25	3000	
	200 Women @ ₹ 15	3000	5000		240 Women @ ₹ 16	3840	6840
25	Normal Loss			75	Actual Loss		
675			30,500	675			33,090

Solution:

Calculation of Material Variances:

RSQ for

A = (400 ÷ 700) × 750 = 428.57

B = (200 ÷700) × 750 = 214.29

C = (100÷700) × 750 = 107.14

	SQSP	RSQSP	AQSP	AQAP
A		428.57 × 50 = 21429	420 × 50 = 21000	
B		214.29 × 20 = 4286	240 × 20 = 4800	
C		107.14 × 15 = 1607	90 × 15 = 1350	
	₹ 25500	₹ 27322	₹ 27150	₹ 26250

SQSP = Standard Cost of Standard Material = ₹ 25,500

RSQSP = Revised Standard Cost of Material = ₹ 27,325

AQSP = Standard Cost of Actual Material = ₹ 27,150

AQAP = Actual Cost of Material = ₹ 26,250

Material Yield Variance = (SQSP - RSQSP) = (25,500 – 27,322) = ₹ 1822 (A)

Material Mix Variance = (RSQSP - AQSP) = (27,322 – 27,150) = ₹ 172 (F)

Material Usage Variance = (SQSP - AQSP) = (25,500 - 27,150) = ₹ 1650 (A)

Material Price Variance = (AQSP – AQAP) = (27,150 - 26,250) = ₹ 900 (F)

Material Cost Variance = (SQSP – AQAP) = (25,500 - 26,250) = ₹ 750 (A)

Check

Material Usage Variance = (Material Yield Variance + Material Mix Variance)

= [1822 (A) + 172 (F)] = ₹ 1650 (A)

Material Cost Variance = (Material Usage Variance + Material Price Variance)

= [(1650 (A) + 900 (F)] = ₹ 750 (A)

Calculation of Labour Variances:

RSH for

Men = 100 ÷ 700 × 750 = 107.14

Women = 200 ÷ 700 × 750 = 214.28

	SRSH	SRRSH	SRAH	ARAH
Men		20 × 107.14 = 2143	20 × 120 = 2400	
Women		15 × 214.28= 3214	15 × 240 = 3600	
	₹ 5000	₹ 5357	₹ 6000	₹ 6840

SRSH = Standard Cost of Standard Labour = ₹ 5000

SRRSH = Revised Standard Cost of Labour = ₹ 5357

SRAH = Standard Cost of Actual Labour = ₹ 6000

ARAH = Actual Cost of Labour = ₹ 6840

Labour Yield Variance = (SRSH - SRRSH) = (5000 -5357) = ₹ 357 (A)

Labour Mix variance = (SRRSH - SRAH) = (5357 – 6000) = ₹ 643 (A)

Labour Efficiency Variance = (SRSH - SRAH) = (5000 – 6000) = ₹ 1000 (A)

Labour Rate Variance = (SRAH - ARAH) = (6000 – 6840) = ₹ 840 (A)

Labour Cost Variance = (SRSH - ARAH) = (5000 – 6840) = ₹ 1840 (A)

Check

Labour Efficiency Variance = (Labour Yield Variance + Labour Mix Variance)

= [357 (A) + 634 (A)] = ₹ 1000 (A)

Labour Cost Variance = (Labour Efficiency Variance + Labour Rate Variance)

= [(1000 (A) + 840 (A)] = ₹ 1840 (A)

Illustration 12

Item	Budget	Actual
No. of working days	20	22
Output per man hour	1.0 Units	0.9 Units
Overhead cost	₹ 1,60,000	₹ 1,68,000
Man-hours per day	8,000	8,400

Calculate Overhead Variances.

Solution:

Step1: Computations

SR = Budgeted FOH ÷ Budgeted Hours

= 160000 ÷ (20 working days × 8000 man hours)

= 160000 ÷ 160000 = 1

RBH = (22 working days × 8000 man hours) = 176000

AH = (22 working days × 8400 man hours) = 184800

AQ = 184800 × 0.9 = 166320

SH = (AQ ÷ Units per hour) = (166320 ÷ 1unit per hour) = 166320

(1)	(2)	(3)	(4)	(5)
SRSH	SRAH	SRRBH	SRBH	ARAH
1 × 166320	1 × 184800	1 × 176000		
₹ 166320	₹ 184800	₹ 176000	₹ 160000	₹ 168000

SRSH = Standard Cost of Standard Fixed Overheads = ₹ 1,66,320

SRAH = Standard Cost of Actual Fixed Overheads (or)

Fixed Overheads absorbed or recovered = ₹ 1,84,800

SRRBH = Revised budgeted Fixed overheads = ₹ 1,76,000

SRBH = Budgeted Fixed overheads = ₹ 1,60,000

ARAH = Actual Fixed Overheads = ₹ 1,68,000

Step2: Computations

FOH Efficiency Variance = (SRSH – SRAH) = (166320 – 184800) = ₹ 18480(A)

FOH Capacity Variance = (SRAH – SRRBH) = (184800 – 176000) = ₹ 8800(F)

FOH Calendar Variance = (SRRBH- SRBH) = (176000 – 160000) = ₹ 16000(F)

FOH Volume Variance = (SRSH – SRBH) = (166320 – 160000) = ₹ 6320(F)

FOH Budget Variance = (SRBH – ARAH) = (160000 – 168000) = ₹ 8000(A)

FOH Cost Variance = (SRSH – ARAH) = (166320 – 168000) = ₹ 1680(A)

Illustration 13

X uses traditional standard costing system. The inspection and setup costs are actually ₹ 1,760 against a budget of ₹ 2,000. ABC system is being implemented and accordingly, the number of batches is identified as the cost driver for inspection and setup costs. The budgeted production is 10,000 units in batches of 1,000 units, whereas actually, 8,800 units were produced in 11 batches.

a. Find the volume and total fixed overhead variance under the traditional standard costing system.

b. Find total fixed overhead cost variance under the ABC system.

Solution:

(a) Calculation of volume and total fixed overhead variances under Traditional Standard Costing System

Budgeted overhead cost per unit = ₹ 2,000 ÷ 10,000 units = ₹ 0.20

Actual overhead cost per unit = ₹ 1,760 ÷ 8,800 units = ₹ 0.20

Total fixed overhead variance = Absorbed budgeted overhead - Actual overhead

= (₹ 0.20 × 8,800 units) – ₹ 1,760 = Nil

Fixed overhead expenditure variance = Budgeted overhead - Actual overhead

= 2,000 – 1,760 = 240(F)

Fixed overhead volume variance = {(Standard absorption rate) × (Budgeted units - Actual units)}

= {₹ 0.20 × (10,000 units - 8,800 units)} = ₹ 240(A)

Check

Total fixed overhead variance = (Expenditure Variance + Volume Variance)

= 240(F) + 240(A) = Nil

(b) Calculation of fixed overhead cost variance under ABC System

Under ABC 8,800 units should have been produced in standard batch size of 1,000 units per batch, i.e. 9 batches. Further, under ABC, variability is to be considered with respect to batches and not units

Budgeted cost per batch = ₹ 2,000 ÷ 10 batches = ₹ 200

Absorbed overheads under ABC = (Budgeted cost per batch × ABC standard number of batches)

= 200 × 9 = ₹ 1,800

Overhead Cost Variance = Absorbed overheads – Actual Overheads

= (1800-1760) = 40(F)

Illustration 14

Compute the missing data indicated by the Question marks from the following.

	Product 'R'	Product 'S'
Sales quantity		
Std.(units)	?	400
Actual (Units)	500	?

	Product 'R'	Product 'S'
Price (Unit)		
Standard	₹ 12	₹ 15
Actual	₹ 15	₹ 20
Sales price variance	?	?
Sales volume variance	₹ 1,200 F	?
Sales value variance	?	?

Sales mix variance for both the products together was ₹ 450 F. 'F' denotes Favorable.

Solution:

Let the standard units of product R be r

Actual units of product S be s

	Standard			Actual		
	Quantity	Price	Value	Quantity	Price	Value
R	R	12	12r	500	15	7500
S	400	15	6000	s	20	20s
	400 + r		6000 + 12r	500 + s		7500 + 20s

Given sales volume variance for R = ₹ 1200(F)

i.e., AQSP –SQSP = ₹ 1200

[(500 × 12) - 12 r] = 1200 or 6000 - 12r = 1200

r = ₹ 400

	AQSP	RSQSP
R	12 × 500	12 × {(500+s)/(400+r)} × 400 = 3000 + 6s
S	15 × s	15 × {(500+s)/(400+r)} × 400 = 3750 +7.5s
	6000 + 15s	6750 + 13.5s

Given, Sales Mix Variance = (AQSP – RSQSP) = ₹ 450(F)

(6000 + 15s – 6750 -13.5s) = 450

-750 +1.5 s = 450

Then s = 800

We, thus, have

Standard units of product R, r = ₹ 400

Actual units of product S, s = ₹ 800

Sales price variance for R = AQ (AP - SP) = ₹ 1500(F)

Sales price variance for S = AQ (AP – SP) = 4000(F)

Sales volume variance for S = SP (AQ – SQ) = ₹ 6000(F)

Sales value variance for R = (AQAP – SQSP) = ₹ 2700(F)

Sales value variance for S = (AQAP – SQSP) = ₹ 10000(F)

Illustration 15

GLOBAL Ltd. is engaged in marketing of wide range of consumer goods. A, B, C and D are the zonal sales officers for four zones. The company fixes annual sales target for them individually. You are furnished with the followings.

- The standard costs of sales target in respect of A, B, C, D are ₹ 5,00,000, ₹ 3,75,000, ₹ 4,00,000 and ₹ 4,25,000 respectively.
- A, B, C, D respectively earned ₹ 29,900, ₹ 23,500, ₹ 24,500 and ₹ 25,800 as commission at 5% on actual sales effected by them during the previous year.
- The relevant variances as computed by a qualified cost accountant are as follows.

	A	B	C	D
	₹	₹	₹	₹
Sales price variance	4000(F)	6000(A)	5000(A)	2000(A)
Sales volume variance	6000(A)	6000(F)	15000(F)	8000(F)

(A) = Adverse variance and (F) = Favorable variance

You are required tocompute the amount of target sales and margin fixed in case of each of the zonal sales officers.

Solution:

Particulars	A	B	C	D
Commission Earned	29,900	23,500	24,500	25,800
Actual Sales (Commission Earned ÷ 5%)	(29,900 ÷ 5%) = 5,98,000	(23,500 ÷ 5%) = 4,70,000	(24,500 ÷ 5%) = 4,90,000	(25,800 ÷ 5%) = 5,16,000
Sales Price Variance	4000(F)	6000(A)	5000(A)	2000(A)
Sales Volume variance	6000(A)	6000(F)	15000(F)	8000(F)
Sales Value Variance	2000 A (+4000 - 6000)	0 (-6000F + 6000)	10000 F (-5000 +15000)	6000 F (-2000 + 8000)
Budgeted Sales	6,00,000 (598000 + 2000)	4,70,000 (470000 - 0)	4,80,000 (490000 - 10000)	5,10,000 (516000 - 6000)
Standard Costs	5,00,000	3,75,000	4,00,000	4,25,000
Budgeted Margin	1,00,000 (600000 - 500000)	95,000 (470000 - 375000)	80,000 (480000 - 400000)	85,000 (510000 - 425000)

Illustration 16

	(₹ In Lakhs)	
	31-03-2020	31-03-2021
Sales	120	129.60
Prime Cost of Sales	80	91.10
Variable Overheads	20	24
Fixed expenses	15	18.50
Profit	5	(4)

During 2020-21, average prices increased over those of the previous years

(1) 20% in case of sales

(2) 15% in case of prime cost

(3) 10% in case of Overheads.

Prepare a profit variance statement from the above data.

Solution:

Step 1: Calculation of Variances:

1. Sales Price Variance = 129.60 – (129.60 × 100/120) = ₹ 21.60 (F)
   (Increase in sale price by 20%)
2. Sales Volume Variance = (129.60 × 100/120) - 120 = ₹ 12 (A)
   (Reduction in sales volume = 10%)
3. Sales Value Variance = 129.60 – 120 = ₹ 9.60 (F)
4. Prime Cost Price Variance = (91.10 × 100/115) – 91.10 = ₹ 11.88 (A)
5. Prime Cost Volume Variance = 80 × 10/100 = ₹ 8 (F)
   (Reduction corresponding to Sales)
6. Prime Cost Usage or Efficiency Variance = (80 × 90/100) - (91.10 × 100/115)
   = ₹ 7.22 (A)
7. Prime Cost Variance = 80 – 91.1 = ₹ 11.1 (A)
8. Variable Overhead Price Variance = (24 × 100/110) - 24 = ₹ 2.18 (A)
9. Variable Overhead Volume Variance = 20 × 10/100 = ₹ 2 (F)
10. Variable Overhead Efficiency Variance = (20 × 90/100) - (24 × 100/110)
    = ₹ 3.82 (A)
11. Variable Overhead Cost Variance = 20 – 24 = ₹ 4 (A)
12. Fixed Overhead Price Variance = (18.50 × 100/110) – 18.50 = ₹ 1.68 (A)
13. Fixed Overhead Efficiency Variance = 15 - (18.50 × 100/110) = ₹ 1.82 (A)
14. Fixed Overhead Cost Variance = 15 – 18.50 = ₹ 3.5 (A)

Step 2: Profit Variance Statement

		₹
Budgeted Profit		5.00
Add: Sales price variance	21.60	
Prime cost volume variance	8.00	
Variable overhead variance	2.00	31.60
		36.60
Less: Sales volume variance	12.00	
Prime cost price variance	11.88	
Prime cost usage variance	7.22	
Variable overhead price variance	2.18	
Variable overhead efficiency variance	3.82	
Fixed overhead price variance	1.68	
Fixed overhead efficiency variance	1.82	40.60
Actual Loss		4.00

Illustration 17

The assistant management accountant of your company has been preparing the profit and loss account for the week ended 31st October. Unfortunately, he has had a traffic accident and is now in a hospital. So, as senior cost analyst you have been asked to complete this statement. The uncompleted statement and relevant data are shown below.

Week ended 31st October

	₹	₹
Sales		50,000
Standard Cost:		
Direct Materials		
Direct Wages		
Overheads	---	---
Standard Profit		
Variances	Fav. /(Adv.)	Fav. /(Adv.)
	₹	₹
Direct Material:		
Price Variance	(400)	
Usage Variance	(300)	
Total Direct Material Variance		(700)

Direct Labour: Rate Variance Efficiency Variance Total Direct Labour Variance		 ---
Overhead Expenditure Variance Overhead Volume Variance Total Overhead Variance		 ---
Total Variance Actual Profit		--- ---

Standard Data

The standard price of direct material used is ₹ 600 per ton. From each tone of material, it is expected that 2,400 units will be produced. A forty-hour week is operated. Standard labour rate per hour is ₹4. There are 60 employees working as direct labour. The standard performance is that each employee should produce one unit of product in 3 minutes. There are 4 working weeks in October. The budgeted fixed overhead for October is ₹ 76,800.

Actual data

Materials used during the week were 20 tones at ₹ 620 per ton. During the week 4 employees were paid of ₹ 4.2 per hour and 6 were paid ₹ 3.8 per hour and remaining were paid at standard rate. Overheads incurred was ₹ 18000. You are required to complete the P & L Statement for the week ended 31st Oct.

Solution:

		₹
Actual Cost of Material 620 × 20		12400
(-) direct material:		
price variance	400	
usage variance	300	(700)
		11700

Production from one ton of direct material of ₹ 600 = 2400 units

Proportionate production for direct material of ₹ 11700

= (2400 ÷600) × 11700 = 46800 units

Standard Labour Hours = (46800 units × 3 minutes) ÷ 60 = 2340 hours

Labour variances

(1)	(2)	(3)
SRSH	SRAH	ARAH
4 × 2340	4 × (40 × 60)	[(4 × 4.20) + (6 × 3.80) + (50 × 4)] × 40 hrs

(1)	(2)	(3)
₹ 9360	₹ 9600	₹ 9584

Labour Rate Variance = (SRAH – ARAH) = (9600-9584) = 16(F)

Labour Efficiency Variance: (SRSH – SRAH) = (9360 -9600) = 240(A)

Overhead variances:

Standard Hours per Week = 40 × 60 = 2400 hours

Budgeted Overheads per Week = ₹ 76,800 ÷ 4 weeks = ₹ 19,200

Standard Overhead Recovery Rate = (19,200 ÷ 2400) ₹ 8 per hour

(1)	(2)	(3)	(4)
SRSH	SRAH	SRBH	ARAH
8 × 2340	8 × 2400		
₹ 18720	₹ 19200	₹ 19200	₹ 18000

OH Expenditure Variance = (SRBH – ARAH) = (19200 – 18000) = 1200(F)

OH Volume Variance = (SRSH – SRBH) = (18720 – 19200) 480(A)

P&L Statement for the week ended 31st October:

		₹	₹
Sales			50000
Standard cost Direct material Direct wages Overheads		 11700 9360 18720	 39780
Standard Profit			10220
Variance	F/(A)	F/(A)	
Direct material: Price Usage Total	 (400) (300)	 (700)	
Direct Labour: Rate Efficiency Total	 16 (240)	 (224)	

Overheads:			
Expenditure	1200		
Volume	(480)		
Total		720	
Total variance			(204)
Actual Profit			10016

Illustration 18

A Company manufactures two products X and Y. Product X requires 8 hours to produce while Y requires 12 hours. In April, 2024, of 22 effective working days of 8 hours a day. 1,200 units of X and 800 units of Y were produced. The company employs 100 workers in production department to produce X and Y. The budgeted hours are 1,86,000 for the year. Calculate Capacity, Activity and Efficiency ratios and establish their relationship

Solution:

		(Hours)
Standard hours of production		
Product X	(1,200 units × 8 hrs.)	9,600
Product Y	(800 units × 12 hrs.)	9,600
Total standard hours		19,200
Actual hours worked	(100 workers × 8 hrs. × 22 days)	17,600
Budgeted hours per month	(1,86,000 hrs./ 12 months)	15,500

$$\text{Capacity Ratio} = \frac{\text{Actual Hours Worked}}{\text{Budgeted Hours p.m.}} \times 100 = \frac{17,600}{15,500} = 113.55\%$$

$$\text{Efficiency Ratio} = \frac{\text{Standard Hours of Production}}{\text{Actual Hours Worked}} \times 100 = \frac{19,200}{17,600} = 109.09\%$$

$$\text{Activity Ratio} = \frac{\text{Standard Hours of Production}}{\text{Budgeted Hours p.m.}} \times 100 = \frac{19,200}{15,500} = 123.87\%$$

Relationship of Ratios

$$\text{Activity Ratio} = \text{Efficiency Ratio} \times \text{Capacity Ratio} = 123.870 = \frac{109.09 \times 113.55}{100}$$

Illustration 19

The following is a flexible budget of FB Co. Ltd. For a production department.

	Level of Activity		
Direct Labour Hours	4000	5000	6000
Number of Units	8000	10000	12000
Fixed Overhead (₹)	5000	5000	5000
Variable Overhead (₹)	800	1000	1200
Total Overheads (₹)	5800	6000	6200

Normal Level of activity was 5000 direct labour hours.

Actual Results were:

Direct Labour hours – 4800

Variable Overhead – ₹ 900

Output in Units – 10400

Fixed Overhead – ₹ 5100

Compute Fixed overhead cost, volume and expenditure variances, variable overhead cost, efficiency and expenditure variances, efficiency, capacity and activity ratios.

Solution:

Step 1: Initial Workings

Normal level of activity has been expressed in terms of direct labour hours. Accordingly:

Standard Labour Hours per unit of Output = (10,000 ÷ 5,000) = 2 hours per unit

Standard Labour Hours for Actual Output = (10,400 ÷ 2) = 5,200 hours

Standard Rate of Recovery for FOH = (5,000 ÷ 5,000) = ₹1 per labour hour

Standard Rate of Recovery for VOH = (1,000 ÷ 5,000) = ₹0.20 per labour hour

Step 2: FOH Variances

Description	Formula	Workings	Variance
FOH Cost Variance	SRSH – AOH	(1 × 5200) – 5100 = 100 (F)	₹ 100 (F)
FOH Volume Variance	SR (SH – BH)	1 × (5200 – 5000) = 200 (F)	₹ 200 (F)
FOH Expenditure Variance	SRBH – AOH	(1 × 5000) – 5100) = 100 (A)	₹ 100 (A)

Step 3: VOH Variances

Description	Formula	Workings	Variance
VOH Cost Variance	SRSH – AOH	(0.2 × 5200) – 900 = 140 (F)	₹ 140 (F)
VOH Volume Variance	SR (SH – BH)	0.2 × (5200 – 4800) = 80 (F)	₹ 80 (F)
VOH Expenditure Variance	SRAH – AOH	(0.2 × 4800) - 900 = 60 (F)	₹ 60 (F)

Step 4: Ratios

Description	Formula	Workings	Ratio
Efficiency Ratio	SH ÷ AH	5200 ÷ 4800	108.33%
Capacity Ratio	AH ÷ BH	4800 ÷ 5000	96 %
Activity Ratio	SH ÷ BH	5200 ÷ 5000	104%

Illustration 20

ABC Ltd adopts a standard costing system. The standard output for a period is 20,000 units and the standard cost and profit per unit is as under:

	₹
Direct Material (3 units @ ₹ 1.50)	4.50
Direct Labour (3 Hrs. @ ₹ 1.00)	3.00
Direct Expenses	0.50
Factory Overheads : Variable	0.25
Fixed	0.30
Administration Overheads	0.30
Total Cost	8.85
Profit	1.15
Selling Price (Fixed By Government)	10.00

The actual production and sales for the period were 14,400 units. There has been no price revision by the Government during the period. The following are the variances worked out at the end of the period.

		Favorable (₹)	Adverse (₹)
Direct Material	Price		4,250
	Usage	1,050	
Direct labour			

		Favorable (₹)	Adverse (₹)
	Rate		4,000
	Efficiency	3,200	
Factory Overheads			
	Variable – Expenditure	400	
	Fixed – Expenditure	400	
	Fixed – Volume		1,680
Administration Overheads			
	Expenditure		400
	Volume		1,680

You are required to:

a. Ascertain the details of actual costs and prepare a Profit and Loss Statement for the period showing the actual Profit/Loss. Show the workings clearly.

b. Reconcile the actual Profit with standard profit.

Solution:

(a) Statement showing the actual profit and loss statement

Serial	Particulars	Amount (₹)	Amount (₹)
A	**Sales (14400 × 10)**		**1,44,000**
B	**Cost**		
1	Material Cost		
	Standard Material Cost (14400 × 4.50)	64800	
	Add: Price Variance	4250	
	Deduct: Usage Variance	(1050)	
	Actual Material Cost		68000
2	Labour Cost		
	Standard Labour Cost (14400 × 3)	43200	
	Add: Rate Variance	4000	
	Deduct: Efficiency Variance	(3200)	
	Actual Labour Cost		44000
3	Direct Expenses (14400 × 0.50)		7200
4	Factory Overhead		

Serial	Particulars	Amount (₹)	Amount (₹)
5	Variable Overhead		
	Standard Variable Overhead (14400 × 0.25)	3600	
	Deduct: Expenditure Variance	(400)	
	Actual Variable Overhead		3200
6	Fixed Overhead		
	Standard Fixed (14400 × 0.30)	4320	
	Add: Volume Variance	1680	
	Deduct: Expenditure Variance	(400)	
	Actual Fixed Overhead		5600
7	Administration Overhead		
	Standard Administration Overhead (14400 × 0.3)	4320	
	Add: Volume Variance	1680	
	Add: Expenditure Variance	400	
	Actual Administrative Overhead		6400
8	Total Cost		134400
C	**Profit (144000 – 134400)**		**9600**

(b) Statement showing reconciliation of standard profit with actual profit

Serial	Particulars	Amount (₹)	Amount (₹)
1	Standard Profit (14400 × 1.15)		16560
2	Add:		
	Add: Material usage variance	1050	
	Labour efficiency variance	3200	
	Variable overhead expenditure variance	400	
	Fixed overhead expenditure variance	400	
	Sub Total		5050
3	Deduct:		
	Material price variance	4250	
	Labour rate variance	4000	
	Fixed overhead volume variance	1680	
	Administration expenditure variance	400	
	Administration volume variance	1680	
	Sub Total		12010
4	Actual Profit (1 + 2 -3)		9600

Illustration 21

X Ltd. produces and sells a single product. Standard cost card per unit of the product is as follows: (₹)

Direct materials:	A	(10 kg.@ 5 per kg.)	50
	B	(5 kg. @ 6 per kg.)	30
Direct wages		(5 hours @ 5 per hour)	25
Variable production overheads		(5 hours @ 12 per hour)	60
Fixed production overheads			25
Total standard cost			190
Standard gross profit			35
Standard selling price			225

Fixed production overhead has been absorbed on the expected annual output of 25,200 units produced evenly throughout the year. During the month of December, 2024, the following were the actual results for an actual production of 2,000 units.

			(₹)
Sales		(2,000 units @ 225)	4,50,000
Direct materials:	A	18,900 kg.	99,225
	B	10,750 kg.	61,275
Direct wages	10,500 hours (actually worked 10,300 hours)		50,400
Variable production overheads			1,15,000
Fixed production overheads			56,600
Total			3,82,500
Gross profit			67,500

The material price variance is extracted at the time of receipt of materials. Material purchases were Material A 20,000 kg. @ ₹ 5.25 per kg & B 11,500 kg. @ ₹ 5.70 per kg.

Required:

i. Calculate all variances.

ii. Prepare an operating statement showing standard gross profit, variances and actual gross profit.

iii. Explain the reason for the difference, if any, in actual gross profit given in the question and calculated in (ii) above.

Solution:

(i) Calculation of variances

Material Variances

Sl	Description	Workings	Derivation
1	**Material Variances**		
a	Standard Quantity for actual output	A = 2,000 × 10 = 20,000 B = 2,000 × 5 = 10,000	20,000 kg. 10,000 kg
b	Revised Standard Quantity (Actual Quantity prorated in proportion to standard consumption)	A = 20,000 / 30,000 × 29,650 = 19,766.67 B = 10,000 / 30,000 × 29,650 = 9,883.33	19,766.67 kg. 9,883.33 kg.
c	Standard yield (Standard Output ÷ Standard Consumption) × Actual Consumption	(2,100/31,500) × 29,650 = 1,976.67	1,976.67
d	Material price variance (on receipt basis)	(SP - AP) AQ A = (5 - 5.25)× 20,000 = 5,000 (A) B = (6 - 5.7) × 11,500 = 3,450 (F)	₹ 1,550 (A)
e	Material usage variance	(SQ- AQ) SP A = (20,000 - 18,900) × 5 = 5,500 (F) B = (10,000 - 10,750) × 6 = 4,500 (A)	₹ 1,000 (F)
f	Material mix variance	SP (RSQ - AQ) A = (19,766.67-18,900) × 5 = 4,333.35 (F) B = (9,883.33 -10,750) × 6 = 5,200.02 (A)	866.67 (A)
g	Material yield variance	SC (AY - SY) = 80 × (2,000 - 1,976.67) = 1,866.67 (F)	₹ 1,866.40 (F)
2	**Labour Variances**		
a	Labour rate variance	(SR - AR) × AH = (5 - 4.8) × 10,500 = 2,100 (F)	₹ 2,100 (F)
b	Labour efficiency variance	SR (SH - AH) = 5 × (10,000 - 10,300) = 1,500(A)	₹ 1,500(A)
c	Labour idle time variance	Idle hours × SR = 200 × 5 = 1,000 (A)	₹ 1,000 (A)
3	**Variable Overhead Variances**		
A	Recovered VOH Standard VOH	2000 × 60 = 1,20,000 10300 × 12 = 1,23,600	
B	VOH Cost Variance	Recovered overhead - Actual overhead = (1,20,000 - 1,15,000) = 5,000 (F)	₹ 5,000 (F)

Sl	Description	Workings	Derivation
C	VOH Expenditure Variance	Standard VOH - Actual VOH = (1,23,600 - 1,15,000) = 8,600 (F)	₹ 8,600 (F)
D	VOH Efficiency Variance	Recovered VOH - Standard VOH = 1,20,000 - 1,23,600 = 3600 (A)	₹ 3600 (A)
4	**Fixed Overhead Variances**		
A	Recovered FOH Budgeted FOH	2000 × 25 = ₹ 50,000 (25,200 × 25) / 12 = ₹ 52,500	
B	FOH Cost Variance	Recovered overhead - Actual overhead = (50,000 - 56,600) = 6,600 (A)	₹ 6,600 (A)
C	FOH Expenditure Variance	Budgeted overhead- Actual overhead = (52,500 - 56,600) = 4100(A)	₹ 4,100 (A)
D	FOH Volume Variance	Recovered overhead - Budgeted overhead = (50,000 - 52,500) = 2,500 (A)	₹ 2 ,500 (A)

(ii) Reconciliation Statement

(₹)

Serial	Description	Favourable	Adverse	Rupees
1	**Standard profit (35 × 2,000)**			**70,000**
2	**Variances**			
A	Material			
	Price		1550.00	
	Mix		866.67	
	Yield	1866.67		
	Sub Total			550 (A)
B	Labour			
	Rate	2100		
	Efficiency		1500	
	Idle Time		1000	
	Sub Total			400 (A)
C	Variable Overheads			
	Expenditure	8600		
	Efficiency		3600	
	Sub Total			5000 (F)

Serial	Description	Favourable	Adverse	Rupees
1	**Standard profit (35 × 2,000)**			**70,000**
2	**Variances**			
D	Fixed Overheads			
	Expenditure		4100	
	Volume		2500	
	Sub Total			6600 (A)
E	Total	12566.67	15116.67	2550 (A)
3	**Actual Profit (70,000 – 2550)**			**67,450**

(iii) Explanation for the difference

Actual gross profit given in the question is 67,500 while calculated profit in statement is ₹ 67,450. The difference amount of ₹ 50 is due to material price variance that is calculated at the time of receipt of material instead of consumption of material.

Material price variance on consumption basis	(SP - AP) AQ A = (5 - 5.25) × 18,900 = 4,725 (A) B = (6 - 5.7) × 10,750 = 3,225 (F)	₹ 1,500 (A)

Material price variance on consumption basis works out to ₹ 1,500(A) instead of ₹ 1,550(A) considered in the reconciliation statement whereby the difference of ₹ 50 arises. Actual Profit stands revised to ₹ 67,500, i.e. (67450 + 50) after adding the difference.

Illustration 22

The summarized results of a company for the two years ended 31st December 2022 and 2023 are given below: -

Year	2023	2022
Particulars	**₹ lacs**	**₹ lacs**
Sales	**770**	**600**
Direct Materials	**324**	**300**
Direct Wages	**137**	**120**
Variable Overheads	**69**	**60**
Fixed Overheads	**150**	**80**
Profit	**90**	**40**

As a result of re-organisation of production methods and extensive advertisement campaign use, the company was able to secure an increase in the selling prices by 10% during the year 2023 as compared to the previous year. In the year 2022, the company consumed 1,20,000 Kgs. of raw materials and used 24,00,000 hours of direct labour. In the year 2023, the corresponding figures were 1,35,000 kgs of raw materials and 26,00,000 hours of direct labour.

You are required to:

Use information given for the year 2022 as the base year information to analyze the results of the year 2023 and to show in a form suitable to the management the amount each factor has contributed by way of price, usage and volume to the change in profit in 2023.

Solution:

(v) Statement of Variances

Sl	Description	Workings	₹ lacs
1	**Sales Variances**		
a	Sales price variance	770 – {770 × (100/110)} = 70(F)	70 (F)
b	Sales volume variance	{770 × (100/110)} - 600 = 100(F)	100(F)
c	Sales value variance	770 – 600 = 170(F)	170(F)
d	% of increase in Volume = (100÷600) × 100 = 16.67%		
2	**Material Variances**		
a	Key computations Material price in 2022 = (30000000)/120000 = ₹ 250 Material expected to be used in 2023 = (120000/600) × 700 = 140000 Kgs Standard Material Cost for 2023 = 140000 × ₹ 250 = ₹ 350 Lacs Material price in 2023 = (32400000)/135000 = ₹ 240		
b	Material cost variance	350 – 324 = 26 (F)	26(F)
c	Material volume variance	16.67% of Consumption for 2022 = 300 × 16.67% = 50(A)	50(A)
d	Material usage variance	SP (SQ-AQ) 250(140000-135000) = 12,50,000	12.50(F)
e	Material price variance	AQ(SP-AP) 135000(250-240) = 1350000	13.50(F)
3	**Labour Variances**		
a	Key computations Labour hours expected to be used in 2023 = (2400000/600) × 700 = 2800000 Labour rate of 2022 = (12000000)/(2400000) = ₹ 5 per hour Standard labour cost for 2023 = 2800000 × 5 = ₹ 140 lacs Labour rate of 2023 = (13700000)/(2600000) = ₹ 5.269 per hour		
b	Labour cost variance	140 -137 = 3 (F)	3(F)

Sl	Description	Workings	₹ lacs
c	Labour volume variance	16.67% of Consumption for 2022 = 120 × 16.67% = 20(A)	20(A)
d	Labour efficiency variance	SR (SH-AH) 5(2800000-2600000) = 10,00,000	10.00(F)
e	Labour rate variance	AH(SR-AR) 2600000(5 - 5.269) = 6,99,400(A) i.e. say 7 lacs(A)	7.00(A)
4	**Variable Overhead Variances**		
a	Key computations Standard variable overheads = ₹ 60 + (₹ 60 × 16.67%) = ₹ 70 Standard variable overheads rate per labour hour = ₹ 60 /24 = ₹ 2.5 VOH rate of 2023 = (6900000)/(2600000) = ₹ 2.65 per hour		
b	VOH cost variance	70 - 69 = 1(F)	1(F)
c	VOH volume variance	16.67% of Consumption for 2022 = 60 × 16.67% = 10(A)	10(A)
d	VOH efficiency variance	SR (SH-AH) 2.5(2800000 - 2600000) = 5,00,000	5(F)
e	VOH expenditure variance	AH(SR-AR) 2600000(2.50 – 2.65) = 3,90,000(A) i.e. say 4 lacs(A)	4(A)
5	**FOH cost variance**	**150 – 80 = 70(A)**	**70(A)**

(ii) Reconciliation Statement

(₹ lacs)

Serial	Description	Favourable	Adverse	Rupees
1	**Profit for 2022**			**40.00**
2	**Variances**			
A	Sales			
	Price	70.00		
	Volume	100.00		
	Sub Total	170.00		170.00(F)

Serial	Description	Favourable	Adverse	Rupees
1	**Profit for 2022**			**40.00**
2	**Variances**			
B	Material			
	Volume		50.00	
	Usage	12.50		
	Price	13.50		
	Sub Total	26.00	50.00	24.00(A)
C	Labour			
	Volume		20.00	
	Efficiency	10.00		
	Price		7.00	
	Sub Total	10.00	27.00	17.00(A)
D	Variable Overheads			
	Volume		10.00	
	Efficiency	5.00		
	Expenditure		4.00	
	Sub Total	5.00	14.00	
				9.00(A)
E	Fixed Overheads		70.00	70.00(A)
F	Total	211.00	161.00	50.00(F)
3	**Profit for 2023**			**90.00**

Uniform Costing and Inter-firm Comparison

5.2

Uniform Costing may be defined as the application and use of the same costing principles and procedures by different organisations under the same management or on a common understanding between members of an association. It is the application of the same costing principles, methods or procedures uniformly by various undertakings in the same industry. It is neither a separate method of cost accounting like specific order costing or operation costing nor a separate technique of costing like marginal costing, or standard costing but is only a particular system of costing which takes the help of both methods and techniques of costing. It is a technique which applies the usual costing techniques like standard costing, marginal costing, and budgetary control uniformly in a number of concerns in the same industry, or even in different but similar industries. Amalgamation and closer working arrangements between groups of manufacturers in particular industries, and organisation for nationalization have necessitated, to a certain extent, the establishment of some degree of uniform costing by industries.

The principles and methods adopted for the accumulation, analysis, apportionment and allocation of costs vary so widely from concern to concern that comparison of costs is rendered difficult and unrealistic. Uniform Costing attempts to establish uniform methods so that comparison of performances in various undertakings can be made to the common advantage of all the constituent units. Uniform Costing, thus, enables cost and accounting data of the member undertakings to be compiled on a comparable basis so that useful and crucial decisions can be taken.

Scope of Uniform Costing

Uniform Costing methods may be advantageously applied:

(a) In a single enterprise having a number of branches or units, each of which may be a separate manufacturing unit,

(b) In a number of concerns in the same industry bound together through a trade association or otherwise, and

(c) In industries which are similar in nature such as gas and electricity, various types of transport, and cotton, jute and woolen textiles.

The need for application of Uniform Costing System exists in a business, irrespective of the circumstances and conditions prevailing therein. In concerns which are members of a trade association, the procedure for Uniform Costing may be devised and controlled by the association or by any other central body specially formed for the purpose.

Need for Uniform Costing:

The need for uniform costing arises from the fact that different units use different cost procedures and principles for costing. The need also arises because of differences in size of the organisation, wage structure, methods of production, degree of automation, and so on. The basic reasons for the differences may be as follows:

(a) Size and organisational set up of the business: The number and size of the departments, sections and

services also vary from one concern to another according to their size and organisation. The difficulty in operating Uniform Cost Systems for concerns which vary widely in regard to size and type of business may to some extent be overcome by arranging the various units in a number of size or type ranges, and applying different uniform systems for each such type.

(b) Methods of production: The use of different types of machines, plant and equipments, degree of mechanization, difference in materials mix and sequence and nature of operations and processes are mainly responsible for the difference in costs.

(c) Methods and principles of cost accounting applied: It is in this sphere that the largest degree of difference arises. Undertakings manufacturing identical or similar products and having the same system of cost accounting would generally employ different methods of treatment of expenditure on buying, storage and issue of materials, pricing of stores issues, payment to workers, basis of classification and absorption of overhead, calculation of depreciation, charging rent on freehold or leasehold assets etc.

In the application of Uniform Costing, the fundamental requirement is to locate any kind of differences and to eliminate or overcome, as far as practicable, the causes giving rise to such differences.

Requisites for Installation of a Uniform Costing System

The organisational set up for implementing the principles and methods of Uniform Costing may take different forms. It may range from a small association of a number of concerns who agree to have uniform information regarding a few specific cost accounting respects, to a large organisation which has a fully developed scheme covering all the aspects of costing. The success of a uniform costing system will depend upon the following:

(a) There should be a spirit of mutual trust, co-operation and a policy of give and take amongst the participating members.

(b) There should be a free exchange of ideas and methods.

(c) The bigger units should be prepared to share improvements, achievements of efficiency, benefits of research, know-how, etc. with the smaller ones,

(d) There should not be any hiding or withholding of information.

(e) There should be no rivalry or sense of jealousy amongst the members.

Fields covered by Uniform Costing:

There is no system of Uniform Costing which may be found to fit in all circumstances. The system to be installed should be tailored to meet the needs of each individual case. The essential points on which uniformity is normally required may be summarized as follows:

(a) Whether costs are required for the individual products i.e., for the cost units or for cost centres.

(b) The method of costing to be applied.

(c) The technique employed such as Standard Costing, Marginal Costing.

(d) Items to be excluded from costs.

(e) The basis of departmentalization.

(f) The basis of allocation of costs to departments and/or service department costs to production departments.

(g) The methods of application administration, selling and distribution overhead to cost of sales.

(h) The method of valuation of work-in-progress.

(i) Methods of treating cost of spoilage, defective work, scrap and wastage.

(j) Methods of accounting of overtime pay bonus and other miscellaneous allowances paid to workers.

(k) Whether purchase, material handling and upkeep expenses are added to the cost of stores or are treated as overhead expenses.

(l) The system of materials control, pricing of issues and valuation of stock.

(m) The system of classification and coding of accounts.

(n) The method of recording accounting information.

Advantages of Uniform Costing:

Main advantages of a Uniform Costing System are summarised below:

i. It provides comparative information to the members of the organisation / association and helps to reduce or eliminate the evil effects of competition and unnecessary expenses arising from competition.

ii. Uniform Costing is a useful tool for management control. Performance of individual units can be measured against norms set for the industry as a whole.

iii. It enables the member concerns to compare their own cost data with that of the others, detect the weakness and to take corrective steps for improvement in efficiency.

iv. It avoids cut-throat completion by ensuring that competition among member units proceeds on healthy lines.

v. The process of pricing policy becomes easier when Uniform Costing is adopted.

vi. By showing the one best way of doing things, Uniform Costing creates cost consciousness and provides the best system of cost control and cost presentation in the entire industry.

vii. The benefits of research and development can be passed on to the smaller members of the association which, in turn, leads to economic prosperity of the industry as a whole.

viii. It enables the industry to submit the statutory bodies reliable and accurate data which might be required to regulate pricing policy or for other purposes.

ix. It serves as a prerequisite to Cost Audit and inter firm comparison.

x. Uniform costing simplifies the work of wage boards set up to fix minimum wages and fair wages for an industry.

Limitations of Uniform Costing:

(i) Uniform costing presumes the application of same principles and methods of Costing in each of the member firms. But individual units generally differ in respect of certain key factors and methods.

(ii) For smaller units the cost of installation and operation of Uniform Costing System may be more than the benefits derived by them.

(iii) Uniform costing may create conditions that are likely to develop monopolistic tendencies within the industry. Prices may be raised artificially and supplies curtailed.

(iv) If complete agreement between the members is not forthcoming, the statistics presented cannot be relied upon. This weakens the Uniform Costing System and reduces its usefulness.

Inter-firm Comparison

Concept of Inter-firm Comparison: Inter-firm comparison as the name denotes means the techniques of

evaluating the performances, efficiencies, deficiencies, costs and profits of similar nature of firms engaged in the same industry or business. It consists of exchange of information, voluntarily of course, concerning production, sales, costs, prices, profits, etc., among the firms who are interested and willing to make the device a success. The basic purposes of such comparison are to find out the weak points in an organisation and to improve the efficiency by taking appropriate measures to wipe out the weakness gradually over a period of time.

Need for Inter-firm Comparison: Every Progressive management, all over the world. has always asked itself the question—how is my company performing in comparison to that of others? The published trading and profit and loss accounts and the balance sheets along-with the annual reports provide scanty data for any purposeful study and assessment of the performance of a company. The figures available from these reports just indicate, in a general way, the profitability, stability, solvency and growth of an organisation; but they do not throw light on whether a company has really made the optimum use of all the available resources in men, materials, etc.

The answer, therefore, depends fully on the availability of more detailed data, and the possibility of comparison with the competitive units in the same line of manufacture.

It is the inter-firm comparison that provides the management with a vivid comparative picture of how its operating performance, financial results, and product cost structure compare with those of other firms of similar size, nature, industry or trade.

Pre-Requisites for Inter-firm Comparison: The following are the main requirements while installing a scheme of inter-firm comparison.

1. **Adaption of Uniform Costing:** There must be a sound system of uniform costing in the firm where inter-firm comparison scheme is to be implemented. A uniform manual should also be prepared and distributed among the member units to enable the function of the system efficiently.
2. **Responsible Organisation:** An organisation must be established to run the system efficiently and for better results. Firms of different sizes in an industry should become members of the organisation. In industrially advanced countries independent agencies such as British Centre for Inter-firm Comparison, European Productivity Agency and U.S. Bureau of Labour Statistics are responsible for collection, coordination and presentation of information. In India some undertakings such as National Productivity Council, the Trade Development Authority, the Bureau of Industrial Costs and Pricing, the Tariff Commission have undertaken, in a limited way, the task of inter-firm comparison. In some cases, trade associations, holding company or parent organisation are doing the work of interfirm comparison.
3. **Collection of Relevant Information:** The information to be collected must be relevant. The nature of information to be collected from the participating firms depends upon the needs of the management, comparative importance of the information and the efficiency of the central body responsible for the collection of the information. Information is generally collected relating to costs and cost structure, labour or machine efficiency and utilisation, raw material consumption, wastage, inventory, return on capital employed, liquidity, reserves and appropriation of profit, methods of production, creditors and debtors, technical aspects, etc.
4. **Methods of Collection:** The time and the form in which the information is to be submitted by the member units must be decided in advance. Multiple statistical tools can be used for the purpose of collection of data, its editing, classification, presentation, drawing conclusions and inferences. Ratio analysis for measuring profitability, efficiency and productivity etc. can also be used.

Benefits of Inter-firm Comparison: The benefits derived from Inter-firm Comparison are as below:

(a) Inter-firm Comparison makes the management of the organisation aware of its strengths and weakness in relation to the other organisations in the same industry.

(b) As only the significant items are reported to the Management, substantial time and efforts are saved.

(c) The management is able to keep up-to-date information of the trends and ratios and, therefore, it becomes easier for them to take the necessary steps for improvement.

(d) It develops cost consciousness among the members of the industry.

(e) Information about the organisation is made available freely without the fear of disclosure of confidential data to outside market or public.

(f) Specialized knowledge and experience of professionally run and successful organisations are made available to smaller units who can take the advantage, as otherwise it may not be possible for them to have such an infrastructure.

(g) The industry, as a whole, benefits from the process due to increased productivity, standardization of products, elimination of unfair comparison and the trade practices.

(h) Reliable and correct data enhance the organisation's power in dealing in with various authorities and Government bodies.

(i) Inter firm comparison assists in a big way in identifying industry sickness and gives a timely warning so that effective remedial steps can be taken to save the organisation.

Limitations of Inter-firm Comparison: The practical difficulties that are likely to arise in the implementation of a scheme of inter-firm comparison are:

(a) The top management may not be convinced of the utility of inter-firm comparison.

(b) Reluctance to disclose data which a concern considers to be confidential.

(c) A sense of complacence on the part of the management who may be satisfied with the present level of profits.

(d) Absence of a proper system of Cost Accounting because of which the costing figures supplied may not be relied upon for comparison purposes.

(e) Non-availability of a suitable base for comparison.

These difficulties may be overcome to a large extent by taking the following steps:

(a) 'Selling' the scheme through education and propaganda. Publication of articles in journals and periodicals, and lecturers, seminars and personal discussions may prove useful.

(b) Installation of a system which ensures complete secrecy.

(c) Introduction of a scientific cost system.

Illustration 23

The share of total production and the cost-based fair price computed separately for each of the four units in industry are as follows:

	₹ Per unit			
Share of Production	40%	25%	20%	15%
Material cost	150	180	170	190
Direct labour	100	120	140	160
Depreciation	300	200	160	100
Other overheads	300	300	280	240
Total Cost	850	800	750	690
20% Return on Capital employed	630	430	350	230
Fair price	1,480	1,230	1,100	920
Capital employed per unit is worked out as follows:				
Net Fixed Assets	3,000	2,000	1,600	1,000
Working Capital	140	150	150	150
Total	3,140	2,150	1,750	1,150

Suggest an Uniform Price that may be adopted by the industry.

Solution:

Computation of Uniform Price:

Weighted Average Cost = [850 × 40%] + [800 × 25%] + [750 × 20%] + [690 × 15%]

= 340 + 200 + 150 + 103.5

= ₹ 793.50

Weighted Average Return (Profit) on Capital Employed

= [630 × 40%] + [430 × 25%] + [350 × 20%] + [230 × 15%]

= 252 + 107.5 + 70 + 34.5

= ₹ 464

Suggested Uniform Price = 793.5 + 464 = ₹ 1,257.50

Terms to Master

Variance: Variance denotes the deviation between the standard proposition and the actual incidence. The proposition could be a pre-set benchmark, budget or estimate and so on.

Revenue Variance: Revenue Variance is the difference between planned, budgeted or standard revenue vis-à-vis the actual revenue generated.

Cost Variance: Cost Variance is the difference between a planned, budgeted or standard cost vis-à-vis the actual cost.

Investigation of Variances: Investigation of variances implies systematic examination of deviations undertaken for the purpose of initiating corrective actions.

Planning Variance: Planning Variance denotes the deviation between the original proposition and the revised proposition

Operating Variance: Operating Variance denotes the deviation between the revised proposition and the actual incidence.

Controllable Variance: Variance is said to be controllable if it is identified as the primary responsibility of a particular person or department.

Uncontrollable Variance: When the variations are due to the factors beyond the control of the concerned person or department, it is said to be uncontrollable.

Standard Costing: Standard Costing is a control technique that reports variances by comparing actual costs to pre-set standards thereby facilitating action through management by exception.

Budgetary Control: Budgetary Control is the process that facilitates effective implementation of the budgets.

Profit Variance: Profit Variance is the difference between planned, budgeted or standard profit vis-à-vis the actual profit attained.

Uniform Costing: Uniform Costing may be defined as the application and use of the same costing principles and procedures by different organisations under the same management or on a common understanding between members of an association.

Inter-firm Comparison: Inter-firm Comparison means the techniques of evaluating the performances, efficiencies, deficiencies, costs and profits of similar nature of firms engaged in the same industry or business.

Exercise

A. Theoretical Questions:

⊙ Multiple Choice Questions

1. A manufacturing company uses two types of materials, X and Y, for manufacture of a standard product. The following information is given:

Standard Mix			Actual Mix		
Material X	120 kg @ ₹ 5	₹ 600	Material X	112 kg @ ₹ 5	₹ 560
Material Y	80 kg @ ₹ 10	₹ 800	Material Y	88 kg @ ₹ 10	₹ 880
	200 kg			200 kg	
Less 30% Loss	60 Kg		Less 25% Loss	50 Kg	
Final Product	140 kg	₹ 1400	Final Product	150 kg	₹ 1440

Direct Materials Mix Variance is:

(a) ₹ 40 (fav.)

(b) ₹ 40 (unfav.)

(c) ₹ 80 (fav.)

(d) ₹ 80 (unfav.)

Workings:

Formula for Direct Materials Mix Variance = SP (SQ – AQ)

Direct Materials Mix Variance for X = 5(120 - 112) = 40 F

Direct Materials Mix Variance for Y = 10(80 - 88) = 80 UF

Total = 40F + 80UF = 40 UF

2. The information relating to the direct material cost of a company is as follows:

Standard price per unit ₹ 7.20

Actual quantity purchased in units 1600

Standard quantity allowed for actual production in units 1450

Material price variance on purchase (Favourable) ₹ 480 What is the actual purchase price per unit?

(a) ₹ 7.50

(b) ₹ 6.40

(c) ₹ 6.5

(d) ₹ 6.90

Workings:

Material Price Variance (MPV) = Standard cost of Actual Quantity - Actual Cost

480 = 7.20 × 1,600 - Actual Cost

or, Actual Cost = 11,520 - 480

or, Actual Cost = 11,040

Actual Price per Unit = 11,040 ÷ 1,600 = ₹ 6.90.

3. In a factory where standard costing system is followed, the production department consumed 1100 kgs of a material @ ₹ 8 per kg for product X resulting in material price variance of ₹ 2200 (Fav) and material usage variance of ₹ 1000 (Adv). What is the standard material cost of actual production of product X?

   (a) 11,000

   (b) 20,000

   (c) 14,000

   (d) 10,000

   Workings:

   Actual Cost = 1100 kgs × ₹ 8 = 8,800

   Material Cost Variance = 2200 F + 1000 A = 1200F

   Standard Cost = Actual Cost + Material Cost Variance

   = 8,800 + 1,200 = 10,000

4. AB Ltd. uses standard cost system. The following information pertains to direct labour for Product X for the month of March, 2020:

   Standard rate per hour = ₹ 8

   Actual rate per hour = ₹ 8.40

   Standard hours allowed for actual production = 2000 hours

   Labour Efficiency variance = ₹ 1,600 (Adverse)

   What were the actual hours worked?

   (a) 1,800

   (b) 1,810

   (c) 2,200

   (d) 2,190

   Workings:

   Labour Efficiency Variance = (ST – AT) × SR

   or,

   (–) ₹ 1,600 = (2,000 – AT) × ₹ 8

   (-) 1600 = 16000 – 8AT

   (-) 17,600 = (-) 8 AT

   AT = 17,600 ÷ 8 = 2,200 hours

5. Aderholt uses activity-based costing to allocate its overheads. The budgeted cost/expected for the Supervisor cost pool was:

Budgeted units	5,000
Number of employees	75

Budgeted Cost	₹ 7,500
The actual costs incurred were:	
Actual Units	5,500
Actual Employees	77
Actual cost	₹ 8,085

What was the total variance for the **pool**?

(a) ₹ 585 Adverse

(b) ₹ 165 Favourable

(c) ₹ 5550 Favourable

(d) ₹ 385 Adverse

Workings:

Standard Quantity (SQ) = 75 employees ÷ 5,000 units × 5,500 units = 82.5 employees

Standard Price (SP) = 7500 ÷75 employees = 100

Standard Cost (SQ × SP) = 82.5 × 100 = 8,250

Actual cost = 8,085

Variance = 8250 - 8085 = 165 F

6. The following figures are extracted from the books of a company:

Budgeted O/H ₹ 10,000 (Fixed ₹ 6,000, Variable ₹ 4,000)

Budgeted Hours 2000

Actual O/H ₹ 10,400 (Fixed ₹ 6,100, Variable ₹ 4,300)

Actual Hours 2100

Variable O/H cost variance and Fixed O/H cost variance will be:

(a) 100 (A) and 200 (A)

(b) 100 (F) and 200 (F)

(c) 100 (A) and 200 (F)

(d) 200 (A) and 100 (F)

Workings:

Overhead Recovery Rate = Budgeted OH ÷ Budgeted Hours = ₹ 2 per hour

Variable O/H Cost variance = Recovered O/H - Actual O/H

= 4200 – 4300 = 100(A)

Fixed O/H Cost variance = 6300 - 6100 = 200 (F)

7. XYZ Ltd is a manufacturing company involved in the production of automobiles. Information from its last budget period is as follows:

Actual production	2, 75,000 Units
Budgeted Production	2, 50,000 Units
Actual fixed production Overheads	₹ 52, 60, 00,000
Budgeted fixed production Overheads	₹ 50, 00, 00,000

Then fixed overhead volume variance and expenditure variance will be:

(a) ₹ 5,00,00,000 (A)

(b) ₹ 5,00,00,000 (F)

(c) ₹ 5,00,00,000 (F)

(d) ₹ 5,00,00,000 (A)

8. A company uses standard absorbing costing. The following information is recorded by the company for October:

	Budget	Actual
Output and sales	8700	8200
Selling Price per unit	₹ 26	₹ 31
Variable Cost per unit	₹ 10	₹ 10
Total Fixed Overheads	₹ 34800	₹ 37000

The sales price variance for October was:

(a) 38500 (A)

(b) 38500 (F)

(c) 41000 (A)

(d) 41000 (F)

Workings:

Sales Price Variance =Actual Quantity × (Actual Price – Standard Price)

= 8200 (31-26)

= ₹ 41000 (F)

9. Which of the following may be the cause of Material Price Variance?

(a) Change in quantity of purchase or uneconomical size of purchase order.

(b) Failure to take advantage of off-season price or failure to purchase when price is cheaper.

(c) Change in basic purchase price of material.

(d) All of the above

10. Variance analysis involves breaking down and analysing the total variance to explain

    (a) How much of the variance is caused by using the resources that are different from the standards, i.e., the quantity variance.

    (b) How much of the variance is caused by using the cost of the resources being different from the standards, i.e., the rate variance.

    (c) All of the Above.

    (d) None of the above

11. A standard costing system consists of the following key elements

    (a) Setting standards for each of the operations.

    (b) Comparing the actual performance with the standard performance.

    (c) Analyzing and reporting variances arising from the difference between actual and standard performance.

    (d) All of the Above.

12. Which of the following statements is correct?

    (a) Standard costing facilitates the integration of accounts so that reconciliation between cost accounts and financial accounts may be eliminated.

    (b) Standard costs are planned costs determined on a scientific basis and they are based upon certain assumed conditions of efficiency and other factors.

    (c) Standard costing is defined as the preparation and use of standard cost, their comparison with actual cost and the measurement and analysis of variances to their cause and points of incidence.

    (d) All of the above.

13. Which of the following statements is true?

    (a) If the actual cost is more than the standard, we call it adverse variance and if the difference is less than the standard, we call it favourable variance.

    (b) In case of sales and profit, if the standard is more than actual, it is adverse variance and if the standard is less than the actual, it is favourable variance.

    (c) Both (a) and (b).

    (d) None of the above.

14. Standard cost and budgeted cost are

    (a) Interrelated but not interdependent.

    (b) Interdependent but not interrelated.

    (c) Interrelated and interdependent.

    (d) None of the above.

15. Efficiency Ratio is

    (a) Available working days ÷ Budgeted working days × 100

    (b) Budgeted hours ÷ Maximum hours in budgeted period × 100

    (c) Standard hours ÷ Actual hours × 100

    (d) None of the above

16. Uniform Costing may not be successfully applied in the following case:

    (a) In a single enterprise having a number of branches, each of which manufactures the same set of products with the same facilities.

    (b) In a number of entities in the same industry bound by a trade association.

    (c) In a number of units across different geographical locations manufacturing one or more of a given set of products.

    (d) In different branches of the same company, each branch making a different product using a unique process.

Explanatory Comment

Though the entity is the same, different products using different (unique) process cannot follow uniform costing.

Answer

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
B	D	D	C	B	C	C	D	D	C	D	D	C	A	B	D

⊙ Essay Type Questions

1. 'The main objective of variance analysis is to provide insights into the off-standard performance'. Discuss.
2. State the primary reasons for cost variances.
3. Highlight the significance of investigation of Variances. What are the methods of Investigation?
4. Write a note on Planning and Operating Variances.
5. What do you understand by Controllable and Non-controllable Variances?
6. Write a note on Cost Variance Ratios.
7. Distinguish between Standard Costing and Budgetary Control.
8. What are the merits and demerits of Standard Costing?
9. What are the merits and demerits of Budgetary Control?
10. Write a note on Profit Variance.
11. What are the advantages of Uniform Costing?
12. What is the need for Interfirm Comparison?

Abbreviations

A	Adverse
AC	Actual Cost
AH	Actual Hours
AQ	Actual Quantity
AP	Actual Price
AR	Actual Rate
AY	Actual Yield
F	Favorable
RBH	Revised Budgeted Hours
RSH	Revised Standard Hours
RSQ	Revised Standard Quantity
SC	Standard Cost
SH	Standard Hours
SQ	Standard Quantity
SP	Standard Price
SR	Standard Rate
SY	Standard Yield