3. Evaluating Performance

ILLUSTRATION 1: MATERIAL VARIANCES

A company manufacturers two products X & Y by using same raw material named 'Polyfil'. 5 & 3 kgs of raw material is used for making 1 unit of X and Y respectively. Purchase price of Polyfil is `.10 per kg. 500 units of X and 200 units of Y were manufactured in a particular period. Actual 2700 & 700 kgs of Polyfil was consumed for the actual production of X & Y respectively at total cost of `.37400/-. Calculate all Material variances.

Solution:

i. Material Cost Variance = Standard Cost – Actual Cost
= 31000 – 37400 = 6400 (A)

ii. Material Price Variance = AQ (SR – AR)
= 2700+700 (10 – 11) = 3400 (A)

iii. Material Usage Variance = SR (SQ – AQ)
= 10 (3100 – 3400) = 3000 (A)

Reconciliation

MCV = MPV + MUV = 3400 (A) + 3000 (A) = 6400 (A)

Working Note:

i. Actual Rate = 37400/ (2700 + 700) = `.11 per kg
ii. Standard Material Quantity for Actual Production = 500 × 5 +200 × 3 = 3100 kgs
iii. Standard Material Cost = 3100 × 10 = 31000
iv. Actual Material Cost = 37400 (given)

ILLUSTRATION 2: LABOUR VARIANCES

A company manufacturers two products X & Y by using same grade of labour. 10 & 8 labour hours are used for making 1 unit of X and Y respectively. Labour rate is `.50 per hour.

500 units of X and 200 units of Y were manufactured in a particular period. Actual labour hours consumed for production of X & Y are 6000 and 2000 respectively at total cost of `.360000/-. Calculate all labour variances.

Solution:

i. Labour Cost Variance = Standard Cost – Actual Cost
= 330000 – 360000 = 30000 (A)

ii. Labour Rate Variance = AH (SR – AR)
= 6000+2000 (50 – 45) = 40000 (F)

iii. Labour Efficiency Variance = SR (SH – AH)
= 50 (6600 – 8000) = 70000 (A)

Reconciliation

LCV = LRV + LEV = 40000 (F) + 70000 (A) = 30000 (A)

Working Note:

i. Actual Rate = 360000/ (6000 + 2000) = `.45 per hour

ii. Standard labour hours for Actual Production = 500 × 10 +200 × 8= 6600 Hours

iii. Standard Labour Cost = 6600 × 50 = 330000

iv. Actual Labour Cost = 360000 (given)

ILLUSTRATION 3: MATERIAL USAGE VARIANCES

ABC Ltd. Is engaged in the production of a standard mix using 90 kgs of chemical X and 60 kgs of chemical Y. Standard price of chemical X & Y are `. 5 and 10 per kg respectively. The standard loss of production is 30%. The actual mixture and yield were as follows:

i. Actual yield 115 kgs.

ii. X 80 kgs @ `.4.50 per kg

iii. Y 70 kgs @ `. 8.00 per kg

Calculate all material variances

Solution:

i. Material Cost Variance **= Standard Cost of Actual Production – Actual Cost**
= 1150 – 920 = 230 (F)

ii. Material Price Variance **= AQ (SR – AR)**
Chemical X = 80 (5 - 4.50) = 40 (F)
Chemical Y = 70 (10 – 8) = 140 (F)
Total Price Variance = 180 (F)

iii. Material Usage Variance = Material Yield Variance + Material Mix Variance

a. Material Yield Variance = Standard Yield Rate (Standard Yield – Actual Yield)
= 10 (105 – 115) = 100 (F)

b. Material Mix Variance = Standard Cost of (Standard Mix – Actual Mix)
= 1050 – 1100 = 50 (A)

c. Material Usage Variance = 100 (F) + 50 (A) = 50 (F)

Reconciliation

Material Cost Variance = Material Proce Variance + Material Usage

Variance 230 (F) = 180 (F) = 50 (F)

Working Note:

1. Computation of Yield Rate

Standard Cost		Actual Cost	
Computation	**Amount**	**Computation**	**Amount**
X: 90 Kgs @ `5/kg	450	X: 80 Kgs @ ` 4.5/kg	360

Y: 60 Kgs @ `.10/kg	600	Y: 70 Kgs @ `. 8/kg	560
Total 150 Kgs	1050	Total 150 Kgs	920
Standard Loss @ 30%= 45 Kgs		Actual Loss (150 – 115) = 35 kgs	
Standard Yield = 105 kgs	1050	Actual Yield = 115 kgs	920
Standard Yield Rate (`./kg) (1050/105)	10	Actual Yield Rate (`./kg) (920/115)	8

2. Standard Cost of Standard Production = Standard Yield Rate × Actual Yield = 10 × 115=1150
3. Actual Cost of Actual Production = 920
4. Standard Cost of Standard Mix = `. 1050
5. Standard Cost of Actual Mix = Actual Qty × Standard Rate

   X: 80 × 5 = 400

   Y: 70 × 10 = 700

   Total = 1100

ILLUSTRATION 4: SALE VARIANCES

A Company engaged in the production and sales of 3 products viz P, Q & R receives the following data of Sales Budget from its Marketing department for the month of December 2024:

Product	Sale Quantity	Sale Price (`. per Unit)	Contribution Margin (`. per Unit)
P	2000	12	6
Q	2000	8	4
R	2000	5	1

Actual Sales was as under

P: 1500 units for `.15,000 Q: 2500 units for `.17,500 R: 3500 units for `.21,000

You are required to calculate all Sales Variances

Solution:

Product	Budget			Actual		
	Quantity	Rate	Amount	Quantity	Rate	Amount
P	2000	12	24000	1500	10	15000
Q	2000	8	16000	2500	7	17500
R	2000	5	10000	3500	6	21000
Total	6000		50000	7500		53500

We also need to work out the Standard sales i.e. Actual quantity sold at Budgeted Price and Revised standard sales i.e. Actual quantity sold at standard price per unit of standard mix.

Product	Standard Sales		
	Actual Quantity	Budgeted Rates	Amount
P	1500	12	18000
Q	2500	8	20000
R	3500	5	17500
Total	7500		55500

Revised Standard Sales (RSS) = Actual quantity × Price per unit of standard mix

= 7500 × (50000/6000) = 62500

a. Sales Value Variance = Budgeted Sales – Actual Sales

= 50000 – 53500 = 3500 (F)

b. Sales Price Variance = Actual Quantity (Standard Rate – Actual Rate)

P: = 1500 (12-10) = 3000 (A)

Q: = 2500 (8 – 7) = 2500 (A)

R: = 3500 (5 – 6) = 3500 (F)

Total 2000 (A)

c. Sales Volume Variance = Standard Rate (Budgeted Quantity – Actual Quantity)

P: = 12 (2000 -1500) = 6000 (A)

Q: = 8 (2000 – 2500) = 4000 (F)

R: = 5 (2000 – 3500) = 7500 (F)

Total 5500 (F)

d. Sales Quantity Variance = Budgeted Sales - Revised Standard Sales

= 50000 – 62500 = 12500 (F)

e. Sales Mix Variance = Revised Standard Sales - Standard Sales

= 62500 – 55500 = 7000 (A)

Reconciliation:

i. Sales Value Variance = Sales Price Variance + Sales Volume Variance = 2000 (A) +5500(F) = 3500 (F)

ii. Sales Volume Variance = Sales Quantity Variance + Sales Mix Variance = 12500(F)+7000(A) = 5500 (F)

ILLUSTRATION 5: SALES MIX VARIANCES

You are a Management Consultant retained by a Company that operates on budgetary control system and works out variance on monthly basis. Data for a particular month is given below. Calculate relevant variances.

	Budget	Actual

Product	Quantity Kgs	Rate (`./kg)	Amount (`. Lakhs)	Quantity Kgs	Rate (`./kg)	Amount (`. Lakhs)
P	50000	10.50	5.25	52000	11.00	5.72
Q	20000	12.00	2.40	16000	11.75	1.88
R	6000	15.00	0.90	5000	15.00	0.75
S	4000	16.00	0.64	5000	16.00	0.80
Total	80000		9.19	78000		9.15

Solution:

Product	Standard Sales		
	Actual Quantity	Budgeted Rates	Amount (`. Lakhs)
P	52000	10.50	5.46
Q	16000	12.00	1.92
R	5000	15.00	0.75
	5000	16.00	0.80
Total	78000		8.93

Revised Standard Sales (RSS) = Actual quantity × Price per unit of standard mix

= 78000 × (9,19,000/80000) = 896025

a. Sales Value Variance = Budgeted Sales – Actual Sales

= 919000 – 915000 = 4000 (A)

b. Sales Price Variance = Actual Quantity (Standard Rate – Actual Rate)

P: = 52000 (10.5-11.00) = 26000 (F)

Q: = 16000 (12 – 11.75) = 4000 (A)

R: = 5000 (15 – 15) = 00

S: = 5000 (16 – 16) = 00

Total = 22000 (F)

c. Sales Volume Variance = Standard Rate (Budgeted Quantity – Actual Quantity)

P: = 10.5 (50000 -52000) = 21000 (F)

Q: = 12 (20000 – 16000) = 48000 (A)

R: = 15 (6000 – 5000) = 15000 (A)

S: = 16 (4000 – 5000) = 16000 (F)

Total = 26000 (A)

d. Sales Quantity Variance = Budgeted Sales - Revised Standard Sales

= 919000 – 896025 = 22975 (A)

e. Sales Mix Variance = Revised Standard Sales - Standard Sales

= 896025 – 893000 = 3025 (A)

Reconciliation:

iii. Sales Value Variance = Sales Price Variance + Sales Volume Variance

= 22000 (F) + 26000(A)

= 4000 (A)

iv. Sales Volume Variance = Sales Quantity Variance + Sales Mix Variance

= 22975(A) + 3025(A)

= 26000 (A)

ILLUSTRATION 6:

The financial results of Sell Well Ltd are given below. Price increase over one year period is estimated to be 10%. Management asks you to prepare a statement showing variation contributed by each factor.

` in Lakhs

Particulars	2022-23	2023-24
Materials Consumed	100000	132000
Wages	60000	66000
Variable Overheads	12000	14000
Fixed Overheads	20000	24000
Net Profit	8000	17000
Sale Value	200000	253000

Solution:

a. Ascertain sale price increase due to inflation and sale quantity increase over an year. Sale of 2023-24 at 2022-23 prices = 253000 × 100/110 = 230000

Sale in 2022-23 = 200000

Sale increase in quantity = 30000, i.e. 15% increase over last year Add: 10% sale price increase over 2022-23 = 230000 × 10% = 23000

Sale in 2023-24 = 253000

b. Ascertain Material consumption increase due to price and sale volume

Material consumed in 2024 at 2023 prices = 132000 × 100/110 = 120000 Material Cost Variance = 100000 – 132000 = 32000 (A)

Material Price Variance = 132000 – 120000 = 12000 (A)

Material volume Variance = 100000 × 15% = 15000 (A)

Material Usage Variance = 5000 (A)Balancing Figure

c. Ascertain Wages increase due to price and sale volume

	Wages in 2024 at 2023 prices	= 66000 × 100/110	= 60000
	Labour Cost Variance	= 60000 – 66000	= 6000(A)
	Labour Rate Variance	= 60000 – 66000	= 6000(A)
	Labour volume Variance	= 60000 × 15%	= 9000(A)
	Labour Efficiency Variance		= 9000 (F) Balancing Figure
d.	Variable Overheads Variance	= 12000 – 14000	= 2000 (A)
	Volume Increase	= 12000 × 15%	= 1800(A)
	Efficiency Variance		= 200 (A) Balancing Figure
e.	Fixed Overheads Expenditure Variance	= 20000 – 24000	= 4000(A)

Statement of Variances **` in Lakhs**

Sr	Particulars	Total Variance	Price Variance	Volume Variance	Usage/ Efficiency Variance
1	Materials Consumed	32000 (A)	12000 (A)	15000 (A)	5000 (A)
2	Wages	6000 (A)	6000 (A)	9000 (A)	9000 (F)
3	Variable Overheads	2000 (A)		1800 (A)	200 (A)
4	Fixed Overheads	4000 (A)			4000 (A)
5	Total Cost	44000(A)	18000(A)	25800(A)	200 (A)
6	Sales	53000(F)	23000(F)	30000(F)	
7	Net Profit	9000(F)	5000(F)	4200(F)	200(A)

ILLUSTRATION 7: CASE STUDY

The executive of Something More Ltd. had several meetings and finalised the budget to be presented to Board of Directors in forthcoming Board Meeting. The budget envisaged an estimated profit of
`.33 lakhs for the year.

On a scrutiny of the budget the Board felt that there is still a scope of profit improvement at least to the extent of 10% on budgeted figure.

In 2022-23, the total sales of the Industry were 10 lakh units, out of that the company's share was 1 lakh units. For the year 2023-24 the Sales Head had assumed the same total Industry market volume and Company's sales share. The Board directed that the industry volume and penetration be re- examined and a profit improvement plan to be submitted in consultation with other departments.

The plan submitted after due considerations embodied the following:

i. The total industry volume would grow in 2023-24 to 12 lakh units and the Company's share can be increased to 11%

ii. Sales mix will be changed from 50% of each size unit to 60% of the larger and 40% of the smaller with a contribution of `.11 & 9 respectively. The selling prices would be so raised that an additional contribution of `.0.50 per unit is available for all units sold.

iii. Additional Expenditure of `.50000 on advertisement and sales promotion, `.25000 on sales staff travelling, packaging design improvement `. 35000 will be incurred. A saving in sales office administrative expenses is anticipated to the extent of `.30000.

iv. Curtailing credit terms would result in saving of `.1.00 lakh and addition investment on
inventory would cost `.70000 more. Borrowing cost is 18% pa.

You are required to draw the profit improvement plan in financial terms spelling out separately the increase or decrease in profit due to volume, sales mix, price, expenses and financing charges.

Solution:

A. Profit Improvement Plan

Particulars	Present	Budget	Variance
Sales Volume – Total Units	100000	132000	32000
Sales Volume – Larger Units	50000	79200	29200
Sales Volume – Smaller Units	50000	52800	2800
Contribution			
Larger Units	50000 × 11 = 550000	79200 × 11.5 = 910800	360800
Smaller Units	50000 × 9 = 450000	52800 × 9.5 = 501600	51600
Total Contribution	1000000	1412400	412400
Less: Increase in Expenses		50000 + 25000 + 35000 - 30000 = 80000	-80000
Add: Reduction in Financing Charges		(100000 - 70000) × 18% = 5400	5400
Net Contribution	1000000	1337800	337800

B. Increase in Profit Due to

1. Volume : Larger Size: 11(79200 – 50000) = 321200
   Smaller Size: 9 (52800 – 50000) = 25200
   Total = 346400
2. Price: 132000 units @ `.0.50 = 66000
3. Savings in Financing Charges = 5400
4. Decrease in Profit due to Expenses increase = 80000

Net Increase in Profit = 337800

A. Let us further analyse the increase in profit due to change in sales volume. As we know: Sales Volume Variance = Sales Quantity Variance + Sales Mix Variance

Standard Contribution per unit of Standard Mix = 1000000/100000 = `.10/unit

Revised Standard Contribution = 132000 × 10 = 1320000

Standard Contribution of Actual Mix = Larger Size: 79200 × 11 = 871200

Smaller Size: 52800 × 9 = 475200

Total Standard Contribution of actual mix = 1346400

Sales Quantity Variance = Revised Standard Contribution – Standard Contribution

= 1320000 - 1000000 = 320000

Sales Mix Variance = Standard Contribution of Actual Mix – Revised Standard Contribution

= 1346400 – 1320000 = 26400

Reconciliation:

Volume Variance = Quantity Variance + Mix Variance = 320000 + 26400 = 346400

ILLUSTRATION 8: CASE STUDY

Net labour efficiency variance for punching department of a Company for the month of April 2024 was computed as follows:

Standard Labour Hours	28500
Actual Labour Hours	30200
Excess Hours	1700
Wage Rate per hour	`. 50
Total Unfavourable Variance	`. 85000

The factory superintendent is responsible for all production operations. He asked the punching department foreman who reports to him to explain the reasons for the excess labour hours consumed. Following analysis was submitted:

Sr	Particulars	Hours	Hours
A	Standard Labour Hours		28500
B	Excess Hours		2140
i	Trainee Operating Machines	48	
	Experienced operator instructing trainee	12	
	Rework time on rejected items	440	
	Rework time on job no. '007' as instructions of the supervisor not clear	80	
	Raw material was not as per quality standards	75	
	Work done on stand by machine as the regular one was overloaded	600	
	Extra set up time due to machine breakdown	15	

	Idle time, No production schedule	420	
	Unexplained	450	
C	Hours saved		440
	New tools used	400	
	Asst Foreman assigned for machine operation for 1 week	40	
D	Actual Working Hours		30200

Examineeachitemcarefullyandgroupthemasresponsibilityoffollowingofficerswithproperreasonof assigning it:

a. Punching Department Supervisor

b. Factory Manager

c. Item not covered under the purview of both

Solution:

A. Items falling within the responsibility of Punching Department Supervisor

Sr	Particulars	No. of Hours	Reason
1	Rework time on items rejected during inspection	440	Due to inefficiency in the department
Sr	**Particulars**	**No. of Hours**	**Reason**
2	Extra Set up time due to machine breakdown	15	Preventive maintenance should have been undertaken to avoid this incurrence
3	Unexplained	450	Proper time booking is required
	Sub Total	905	
4	Less: Saving for deputing Asst Foreman to machine operation for 1 week	40	
5	Net Excess Hours	865	

A. Items falling within the responsibility of Factory Manager

Sr	Particulars	No. of Hours	Reason
1	Rework time on Job No.007	80	Instructions from Superintendent were not clear
2	Work done on standby machine	600	Proper loading of machine was not done
3	Idle Time	420	Proper work scheduling is is required to avoid such recurrence
	Sub Total	1100	

4	Less: Hours saved due to new tools used	400	Good initiative on the part of Factory
5	Net Excess Hours	700	

B. Items not falling within the purview of Both

Sr	Particulars	No. of Hours	Reason
1	Trainee Operating Machine	48	Management Policy
2	Experienced Operator Instructing Trainee	12	Management Policy
3	Raw material was not as per quality standards	75	Responsibility of the Purchase Department
	Sub Total	135	

Grand Total A + B + C = 1700 Hours

ILLUSTRATION 9:

A Ltd manufacturers metal furniture. Product 'Y' is one of the middle range products of the company that uses metal for frame and upholstery in plastic. The company follows standard Costing systems and works out variance analysis regularly and data remains quite confidential. During February 2024, a fire broke out in the office of the Company that destroyed all the documents related to budget and standards of the Company for year 2023-24.

All the operations data for the month of February 2024 is given below:

Particulars	Values
Production Materials	1500 standard units
Labour & Overheads	1200 standard units
Materials Issued in Kgs: Metal Plastic	 15000 3100
Material Cost in `. Lakhs Metal Plastic	 8250 3255
Direct Labour in `. Lakhs Direct Labour Hours Worked	19000 5000
Actual Overheads Fixed Variable	 6560 3950
Variances	
Metal Price: `.750 (Adverse)	Usage: Nil
Plastics Price: `.155 (adverse)	Usage `. 100 (Adverse)

Labour Rate: `.1000 (Favourable)	Efficiency `.800 (Adverse)
Variable Overheads: Total : `.350 (Adverse)	
Fixed Overheads: Budget: `.40 (Favourable)	Capacity: `.600 (Favourable)

Reconstruct the Standard Cost Sheet of the Product 'Y' and find out the standard cost per unit.

Solution:

A. Cost Sheet for Product 'Y'

Elements of Cost	Actual		Standard		
	Quantity	Amount	Quantity	Rate	Amount
Materials: Metal Price Variance (A) Usage Variance	15000 Unit	8250 (-)750 0	15000	0.50	7500
Plastic Price Variance (A) Usage Variance (A)	3100 U (-)100	3255 (-)155 (-)100	3000	1.00	3000
Labour Rate Variance (F) Efficiency Variance (A)	5000 H 200	19000 1000 800	4800	4	19200
Variable Overheads Total Variance (A)		3950 (-)350			3600
Fixed Overheads Budget Variance (F) Capacity Variance (F)		6560 40 600			7200
Total Cost					40500

B. Standard Cost Per unit of Product 'Y'

Elements of Cost	Quantity Per Unit	Rate (`. Per Unit)	Amount (`.)
Materials			
Metal	15000/1500=10 Kgs	0.50 per kg	5.00
Plastic	3000/1500 = 2 kgs	1.00 per kg	2.00
Direct Labour	4800/1200 = 4 hours	4.00 per Hour	16.00
Variable Overheads	3600/1200	`.3.00 per unit	3.00
Fixed Overheads	7200 /1200	`.6.00 per unit	6.00
Total Cost Per unit			32

ILLUSTRATION 10

A Ltd. uses standard Costing system for its widely sold product 'Alexa'. Standard Cost card is as follows:

Sr	Particulars	`. Per Unit
1	Selling Price	120
2	Direct Material: 1 kg per unit	20
3	Direct Labour: 6 hours	48
4	Variable Overheads	24

Budgeted Sale & production is 50000 units for the period whereas actual production is 52000 units and actual sale is 51200 units.

Other actual information is Sale Value - `. 6133760
Direct Materials - `. 1065600
Direct Labour - 3.00 Lakhs
Hours
- `. 2442000
Variable Overheads - `. 1228000

Calculate

i. Direct Labour Rate Variance,
ii. Direct Labour Efficiency Variance,
iii. Sales Volume Variance
iv. Sales Price Variance

Also comment on your findings in i. & ii above.

Solution:

i. Direct Labour Rate Variance = Standard Rate (SR) × Actual Hours produced (AHP) – Actual Rate (AR) × Actual Hours produced = 8 × 300000 – 2442000 = 42000 (A)

ii. Direct Labour Efficiency Variance = SR (Standard Hours for Actual Output – AHP)
= 8 ((6 × 52000) – 300000) = 96000 (F)

iii. Sales Volume Variance = Budgeted selling price (Actual Quantity – Budgeted Quantity)
= 120 × (51200 – 50000) = 144000 (F)

iv. Sales Price Variance = Actual Quantity × (Actual Selling Price – Budgeted Selling Price)
= 51200(119.80 - 120) = 10240(A)

Comments on i. & ii:

a. Labour efficiency variance of `. 96000 (F) represents cost savings due to time saved. On the other hand adverse Labour rate variance indicates extra wage burden due to rate increase.

b. Labour time saving will also lead to savings in the variable overheads and thereby contribution will also increase.

ILLUSTRATION 11

The following information relates to a manufacturing concern:

Standard	**Rs.**
Material A 24,000 kgs @ Rs. 3 per kg.	72,000
Material B 12,000 kgs @ Rs. 4 per kg	48,000
Wages 60,000 hours @ Rs. 4 per hour	2,40,000
Variable Overheads 60,000 hours @ Rs. per hour	60,000
Fixed Overheads 60,000 hours @ Rs. 2 per hour	1,20,000
Total Cost	5,40,000
Budgeted Profit	60,000
Budgeted Sales	6,00,000
Budgeted Production (units)	12,000
Actual	**Rs.**
Sales (9,000 units)	4,57,500
Material A Consumed 22,275 kgs.	62,370
Material B Consumed 10,890 kgs.	44,649
Wages Paid (48,000 hours)	1,91,250
Fixed Overhead	1,20,900
Variable Overhead	45,000
Labour Hours Worked	47,700
Closing (Work in Progress)	900 units
Degree of Completion	
Material A and B	100%
Wage and Overheads	50%

Required

Calculate all variances.

Solution

BASIC CALCULATIONS

Equivalent Production in Units

Particulars	**Direct Materials**		**Labour & Overhead**	
Units Completed	100%	9,000	100%	9,000
Work-in-Progress	100%	900	50%	450
Total Equivalent Units		9,900		9,450

Standard and Actual Cost of Material

Material	Standard Cost of 9,900 units			Actual Cost of 9,900 units			Amt (Rs.) [AQ × SP]
	Qty. (Kg.) [SQ]	Rate (Rs.) [SP]	Amt (Rs.) [SQ × SP]	Qty. (Kg.) [AQ]	Rate (Rs.) [AP]	Amt (Rs.) [AQ × AP]	
A	19,800	3	59,400	22,275	2.80*	62,370	66,825
B	9,900	4	39,600	10,890	4.10*	44,649	43,560
Total	29,700		99,000	33,165		1,07,019	1,10,385

**Actual Cost/Actual Quantity*

COMPUTATION OF VARIANCES

Direct Material Variances

Material Cost Variance = Standard Cost – Actual Cost

= SQ × SP – AQ × AP

(A) = Rs. 59,400 – Rs. 62,370

= Rs. 2,970 (A)

(B) = Rs. 39,600 – Rs. 44,649

= Rs. 5,049 (A)

Total = Rs. 2,970 (A) + Rs. 5,049 (A)

= Rs. 8,019 (A)

Material Price Variance = Standard Cost of Actual Quantity – Actual Cost

= AQ × SP – AQ × AP

Or

= AQ × (SP – AP)

(A) = 22,275 Kg. × (Rs. 3.00 – Rs. 2.80)

= Rs. 4,455 (F)

(B) = 10,890 Kg. × (Rs. 4.00 – Rs. 4.10)

= Rs. 1,089 (A)

Total = Rs. 4,455 (F) + Rs. 1,089 (A)

= Rs. 3,366 (F)

Material Usage Variance = Standard Cost of Standard Quantity for Actual Output – Standard Cost of Actual Quantity

$= SQ \times SP - AQ \times SP$

$= SP \times (SQ - AQ)$

(A) = Rs. 3 × (19,800 Kg. – 22,275 Kg.)

= Rs. 7,425 (A)

(B) = Rs. 4 × (9,900 Kg. – 10,890 Kg.)

= Rs. 3,960 (A)

Total = Rs. 7,425 (A) + Rs. 3,960 (A)

= Rs. 11,385 (A)

Material Mix Variance = Total Actual Quantity (units) × (*Average* Standard Price *per unit* of Standard Mix – Average Standard Price *per unit* of Actual Mix)

$= 33165 \times (\frac{99,000}{29,700} - \frac{1,10,385}{33,165})$

$= 165(F)$

Material Yield Variance

= *Average* Standard Price *per unit* of Standard Mix × [Total Standard Quantity (units) – Total Actual Quantity (units)]

$= (\frac{99000}{29700}) \times (29700 - 33165)$

$= 11550\ (A)$

Direct Labour Variances

Labour Cost Variance

= Standard Cost – Actual Cost

= SH × SR – AH* × AR

= (9,450 units × 5 hours) × Rs. 4 – Rs.1,91,250

= Rs. 2,250 (A)

Labour Rate Variance

= Standard Cost of Actual Time – Actual Cost

= SR × AH* – AR × AH*

Or

= (SR – AR) × AH*

$= \frac{191250}{48000\ hrs} - 4) \times 48000\ hrs$

= 750(F)

AH refers to Actual Hours Paid*

Labour Efficiency Variance

= Standard Cost of Standard Time for Actual Production – Standard Cost of Actual Time

= (SH × SR) – (AH# × SR)

Or

= (SH – AH#) × SR

= Rs.4.00 × (9,450 units × 5 hours – 47,700 hours)

= Rs. 1,800 (A)

Idle Time Variance

= Standard Rate per Hour × Actual Idle Hours

= (AH* × SR) – (AH# × SR)

Or

= (AH* – AH#) × SR

Rs.4.00 × (48,000 hours – 47,700 hours)

= Rs. 1,200 (A)

AH# refers to Actual Hours Worked

Variable Overhead Variances

Cost Variance

= Standard Variable Overheads for Production – Actual Variable Overheads

$= 9450\ units \times (\frac{60000}{12000}) - 45000$

= 2,250 (F)

Expenditure Variance

= Budgeted Variable Overheads for Actual Hours – Actual Variable Overheads

= 47,700 hours × Rs. 1 – Rs. 45,000

= Rs. 2,700 (F)

Efficiency Variances

= Standard Variable Overheads for Production – Budgeted Variable Overheads for Actual Hours

$= 9450\ units\ (\frac{60000}{12000}) - 47700 \times 1$

= 450 (A)

Fixed Overhead Variances

Cost Variance

= Absorbed Fixed Overheads – Actual Fixed Overheads

$9450\ units\ (\frac{120000}{12000}) - 120900$

= 94500 – 120,900

= 26,400 (A)

Expenditure Variance

= Budgeted Fixed Overheads – Actual Fixed Overheads.

= Rs. 1,20,000 – Rs.1,20,900

= Rs. 900 (A)

Volume Variance

= Absorbed Fixed Overheads – Budgeted Fixed Overheads

= Rs. 94,500 – Rs. 1,20,000

= Rs. 25,500 (A)

Efficiency Variance = Absorbed Fixed Overheads – Budgeted Fixed Overheads for Actual Hours

= Rs. 94,500 – Rs. 2.00 × 47,700 hours

= Rs. 900 (A)

Capacity Variance = Budgeted Fixed Overheads for Actual Hours – Budgeted Fixed Overheads

= Rs. 2.00 × 47,700 hours – Rs. 1,20,000

= Rs. 24,600 (A)

Sales Variances

Value Variance = Actual Sales – Budgeted Sales

= AP × AQ – BP × BQ

= Rs. 4,57,500 – Rs.6,00,000

= Rs. 1,42,500 (A)

Price Variance = Actual Sales – Standard Sales

= AP × AQ – BP × AQ

Or

$= 9000\ units \times [(\frac{600000}{9000\ units}) - (\frac{\quad}{12000\ units})]$

= 7,500 (F)

Volume Variance = Standard Sales – Budgeted Sales

= BP × AQ – BP × BQ

Or

= BP × (AQ – BQ)

= Rs.50 × (9,000 units – 12,000 units)

= Rs.1,50,000 (A)

Sales Margin Variances

Sales Margin Price Variance = Sales Price Variance

= 7,500 (F)

Sales Volume Variance = Sales Volume Variance × Budgeted Net Profit Ratio

$= 150000\,(A) \times (\frac{60000}{600000} \times 100)$

= **15,000 (A)**

Margin Variance = Sales Margin Price Variance + Sales Margin Volume Variance

= Rs.7,500 (F) + Rs.15,000 (A)

= Rs. 7,500 (A)

Sales Price Variance is equal to **Sales Margin Price Variance**. This is because, for the actual quantity sold, standard cost remaining constant, change in selling price will have equal impact or turnover and profit.

Sales Margin Volume Variance is **equal** to **Sales Volume Variance × Budgeted Net Profit Ratio**

ILLUSTRATION 12

S. Ltd. operates a system of standard costing in respect of one of its products which is manufactured within a single cost centre, the following information is available:

Standard price of material is Rs. 2 per litre. The standard wage rate is Rs. 6 per hour and 5 hours are allowed to produce one unit. Fixed production overhead is absorbed at the rate of 100% of direct wages cost.

During the month just ended the following occurred –

Rs. Actual Price (paid for material purchased) 1.95per litre

Total Direct Wages Cost…… 1,56,000

Fixed Production Overhead…… 1,58,000

Variance	Favourable (Rs.)	Adverse (Rs.)
Direct Material Price	8,000	-
Direct Material Usage	-	5,000
Direct Labour Rate	-	5,760
Direct Labour Efficiency	2,760	-
Fixed Production Overhead Expenditure	-	8,000

Required

Calculate the following for the month-

(i) Budgeted output in units.
(ii) Number of litres purchased.
(iii) Number of litres used above standard allowed.
(iv) Actual units produced.
(v) Actual hours worked.
(vi) Average actual wage rate per hours.

Solution

Fixed Overhead Expenditure = Budgeted Fixed Overheads – Actual Fixed Overheads Variance

Rs.8,000 (A) = Budgeted Output × (Rs. 6 × 5 hrs.) – Rs.1,58,000

Budgeted Output	= 5,000 units
Number of litres purchased	
Material Price Variance	= Actual Quantity × (Std. Price – Actual Price)
Rs.8,000 (F)	= No. of litres purchased × (Rs. 2 – Rs. 1.95)
No. of litres purchased	= 1,60,000 litres

Number of litres used above standard allowed

Material Usage Variance	= Standard Price × (Standard Quantity – Actual Quantity)
Rs.5,000 (A)	= Rs. 2 × (Standard Quantity – 1,60,000 litres)
Standard Quantity	= 1,57,500 litres
No. of litres above Standard	= 1,60,000 litres – 1,57,500 litres
	= 2,500 litres

Actual units produced

Labour Cost Variance	= Rate Variance + Efficiency Variance
	= Rs. 5,760 (A) + Rs. 2,760 (F)
	= Rs. 3,000 (A)
Labour Cost Variance	= Standard Cost – Actual Cost
Rs.3,000 (A)	= Actual Output × (Rs. 6 × 5 hrs.) – Rs.1,56,000
Actual Output	= 5,100 units

Actual hours worked

Labour Efficiency Variance	= Standard Rate × (Standard Hours – Actual Hours)
Rs.2,760 (F)	= Rs. 6 x (5,100 units × 5 hrs. – Actual Hours)
Actual Hours	= 25,040 hours

Average actual wage rate per hours

Labour Rate Variance	= Actual Hours × (Standard Rate – Actual Rate)
Rs.5,760 (A)	= 25,040 hours × (Rs. 6 – Actual Rate)
Actual Rate	= Rs. 6.23...*per hour*

ILLUSTRATION 13

The details regarding a product manufactured by ZED & Co. for the last one week are as follows:

Standard Cost (for one unit)		**Rs.**
Direct Materials	(10 unit @ Rs. 1.50)	15
Direct Wages	(5 hours @ Rs. 8.00)	40
Production Overheads	(5 hours @ Rs. 10.00)	50

	105

Actual (for whole activity)	Rs.
Direct Materials	6,435
Direct Wages	16,324
Direct Materials	
Price	585 (A)
Usage	375 (F)
Direct Wages	
Rate	636 (F)
Usage	360 (A)
Production Overheads	
Expenditure	400 (F)
Volume	750 (F)

Required

(i) Calculate actual output units;
(ii) Calculate actual price of material per unit;
(iii) Calculate actual wage rate per labour hour;
(iv) Calculate the amount of production overhead incurred, and
(v) Calculate the production overhead efficiency variance.

Solution:

Actual output units

Material Cost Variance = Price Variance + Usage Variance

= Rs. 585 (A) + Rs. 375 (F)

= Rs. 210 (A)

Material Cost Variance = Standard Cost of Standard Quantity for Actual Production

(refer as Standard Cost)– Actual Cost

Rs.210 (A) = Rs. 15 × Actual Output – Rs. 6,435

Actual Output = 415 units

Material Usage Variance = Standard Price × (Standard Quantity – Actual Quantity)

Rs.375 (F) = Rs. 1.5 × (415 units × 10 units – Actual Quantity)

Actual Quantity = 3,900 units

Actual price of material per unit

Actual price of Material *per unit* = Actual Cost / Actual Quantity

= Rs.6,435 / 3,900 units

= Rs. 1.65

Actual wage rate per labour hour

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

Rs.636 (F) = Actual Hours × (Rs. 8 – Actual Rate)

Rs.636 (F) = Actual Hours × Rs. 8 – Actual Cost

Rs.636 (F) = Actual Hours × Rs. 8 – Rs. 16,324

Actual Hours = 2,120 Hours

Actual Wage Rate *per hour* = Actual Wages / Actual Hours

= Rs.16,324 / 2,120 hours

= Rs. 7.7 *per hour*

The amount of production overhead incurred

Production Overhead Cost = Expenditure Variance + Volume Variance Variance

= Rs. 400 (F) + Rs. 750 (F)

= Rs. 1,150 (F)

Production Overhead Cost = Absorbed Overheads –

Actual Overheads Variance Rs. 1,150 (F) = Rs. 50 × 415 units – Actual Overheads

Actual Overheads = Rs. 19,600

The production overhead efficiency variance

Production Overhead Efficiency = Absorbed Overheads – Budgeted Overheads for Actual Variance Hours

= Rs. 10 × (5 Hours × 415 units) – Rs. 10 × 2,120 Hours

= Rs. 450 (A)

ILLUSTRATION 14

Compute the missing data indicated by the question marks from the following:

Product R		**Product S**
Standard Sales Qty.(Units)	? ? ?	400
Actual Sales Qty. (Units)	500	? ? ?
Standard Price/Unit	Rs.12	Rs.15
Actual Price/Unit	Rs.15	Rs.20
Sales Price Variance	? ? ?	? ? ?
Sales Volume Variance	Rs.1,200 (F)	? ? ?
Sales Value Variance	? ? ?	? ? ?

Sales Mix Variance for both the products together was Rs. 450 (F). 'F' denotes favourable.

Solution:

Statement Showing "Standard & Actual Data (incomplete)"

Product	**Standard / Budgeted Data**			**Actual Data**		
	Qty. (units)	**Price (per unit)**	**Amount (Rs.)**	**Qty. (units)**	**Price (per unit)**	**Amount (Rs.)**
R	? ??	Rs. 12	? ? ?	500	Rs. 15	7,500
S	400	Rs. 15	6,000	? ? ?	Rs. 20	? ? ?
Total	? ? ?		? ??	? ??		? ? ?

Product: R

Sales Price Variance = Actual Qty. × (Actual Price – Budgeted Price)

= 500 units × (Rs. 15 – Rs. 12)

= Rs. 1,500 (F)

Sales Volume Variance = Budgeted Price × (Actual Qty. – Budgeted Qty.)

Rs.1,200 (F) = Rs. 12 × (500 units – Budgeted Qty.)

Budgeted Qty. = 400 units Sales

Value Variance = Sales Price Variance + Sales Volume Variance

= Rs. 1,500 (F) + Rs. 1,200 (F)

= Rs. 2,700 (F)

The table can now be presented as follows. Assumed **Actual Quantity of S** is **'T' units**

Product	Standard / Budgeted Data			Actual Data		
	Qty. (units)	Price (per unit)	Amount (Rs.)	Qty. (units)	Price (per unit)	Amount (Rs.)
R	400	Rs. 12	4,800	500	Rs. 15	7,500
S	400	Rs. 15	6,000	T	Rs. 20	20 x T
	800		10,800	500 + T		7,500 + 20T

Sales Mix Variance = Total Actual Qty (units) × (*Average* Budgeted Price *per unit* of Actual Mix – *Average* Budgeted Price *per unit* of Budgeted Mix)

$450 = (500\ units + T\ units) \times [(\frac{500\ units \times 12 + T\ units \times 15}{500\ units + T\ units}) - (\frac{10800}{800\ units})]$

$450 = 6000 + 15T - 13.5 \times (500 + T)$

$T = 800$ units

Statement Showing "Standard & Actual Data (Complete)"

Product	Standard / Budgeted Data			Actual Data		
	Qty. (units)	Price (per unit)	Amount (Rs.)	Qty. (units)	Price (per unit)	Amount (Rs.)
R	400	Rs. 12	4,800	500	Rs. 15	7,500
S	400	Rs. 15	6,000	800	Rs. 20	16,000
	800		10,800	1,300		23,500

Product: S

Sales Price Variance = Actual Qty. × (Actual Price – Budgeted Price)

= 800 units × (Rs. 20 – Rs. 15)

= Rs. 4,000 (F)

Sales Volume Variance= Budgeted Price × (Actual Qty. – Budgeted Qty.)

= Rs. 15 × (800 units – 400 units)

= Rs. 6,000 (F)

Sales Value Variance = Sales Price Variance + Sales Volume Variance

= 4,000 (F) + 6,000 (F)

= 10000(F)

ILLUSTRATION 15

A company produces a product X, using raw materials A and B. The standard mix of A and B is 1: 1 and the standard loss is 10% of input.

A		B	Total
Standard price of raw material (Rs / kg.)	24	30	
Actual input (kg.)	?	70	
Actual output (kg.)			?
Actual price Rs. / kg.	30	?	
Standard input quantity (kg.)	?	?	
Yield variance (sub usage)			270(A)
Mix variance			?
Usage variance	?	?	?
Price variance	?	?	?
Cost variance	0	?	1,300(A)

Required

Compute the missing information indicated by "?" based on the data given above.

Solution:

WORKING FOR FINDING – MISSING FIGURES

Cost Variance $_{A}$ = 0

Cost

Variance

$_{(A+B)}$ = Rs.1,300 (A) Yield Variance $_{(A+B)}$ = Rs.270 (A)

Standard Cost and Actual Cost (Incomplete Information)

Raw Material	Standard Data			Actual Data		
	Qty. (Kg.) [SQ]	Price (Rs.) [SP]	Amount (Rs.) [SQ x SP]	Qty. (Kg.) [AQ]	Price (Rs.) [AP]	Amount (Rs.) [AQ x AP]
A	? ??	24	? ? ?	? ? ?	30	? ? ?
B	? ??	30	? ? ?	70	? ? ?	? ? ?
Total	? ? ?		? ??	? ??		? ? ?

Material Cost Variance **A** = Standard Cost – Actual Cost

0 = (SQ_A × Rs. 24 – AQ_A × Rs. 30)

SQ_A = 1.25 AQ_A

Material Yield Variance (A+B) = *Average* Standard Price *per unit* of Standard Mix × [Total Standard Quantity (units) – Total Actual Quantity (units)]

270 (A) $= \left(\frac{24 \times SQ_A + Rs.30 \times SQ_B}{SQ_A + SQ_B}\right) \times [(SO_A + SQ_B) - (AQ_A + 70)]$

$SQ_A = SQ_B$ as Standard Mix is in ratio 1:1

270 (A) $= \left(\frac{24 \times SQ_A + Rs.30 \times SQ_A}{SQ_A + SQ_A}\right) \times [(SO_A + SQ_A) - (AQ_A + 70)]$

270 (A) = 27 × [2 x SQ_A – (AQ_A+70)]

270 (A) = 27 × [2 x 1.25 AQA – (AQA+70)]

AQ_A = 40 Kg.

As SQ_A = 1.25 AQA

= 1.25 × 40 Kg.

= 50 Kg.

As SQ_B = SQ_A

= 50 Kg

Cost Variance $_{(A+B)}$ = Standard Cost – Actual Cost

1,300 (A) = (50 Kg. × Rs. 24 + 50 Kg. × Rs. 30) – (40 Kg. × Rs. 30+70 Kg. × APB) $\Rightarrow$ AP_B = Rs. 40

Standard Cost and Actual Cost (Complete Information)

Raw Material	Standard Data			Actual Data			Std. Cost of Actual Qty. (Rs.) [AQ x SP]
	Qty. (Kg.) [SQ]	Price (Rs.) [SP]	Amount (Rs.) [SQ x SP]	Qty. (Kg.) [AQ]	Price (Rs.) [AP]	Amount (Rs.) [AQ x AP]	
A	50	24	1,200	40	30	1,200	960
B	50	30	1,500	70	40	2,800	2,100
Total	100		2,700	110		4,000	3,060

COMPUTATION OF VARIANCES

Material Cost Variance = Standard Cost – Actual Cost

= SQ × SP – AQ × AP

(A) = Rs. 1,200 – Rs. 1,200

= Rs. 0

(B) = Rs. 1,500 – Rs. 2,800

= Rs. 1,300 (A)

Total = Rs. 0 + Rs. 1,300 (A)

= Rs. 1,300 (A)

Material Price Variance = Standard Cost of Actual Quantity – Actual Cost

= AQ × SP – AQ × AP

Or

= AQ × (SP – AP)

(A) = 40 Kg. × (Rs. 24.00 – Rs. 30.00)

= Rs. 240 (A)

(B) = 70 Kg. × (Rs. 30.00 – Rs. 40.00)

= Rs. 700 (A)

Total = Rs. 240 (A) + Rs. 700 (A)

= Rs. 940 (A)

Material Usage Variance = Standard Cost of Standard Quantity for Actual Output – Standard Cost of Actual Quantity

= SQ × SP – AQ × SP

Or

= SP × (SQ – AQ)

(A) = Rs. 24 × (50 Kg. – 40 Kg.)

= Rs. 240 (F)

(B) = Rs. 30 × (50 Kg. – 70 Kg.)

= Rs. 600 (A)

Total = Rs. 240 (F) + Rs. 600 (A)

= Rs. 360 (A)

Material Mix Variance = Total Actual Quantity (units) × (*Average* Standard Price *per unit* of Standard Mix – Average Standard Price *per unit* of Actual Mix

$= \left|\frac{2700}{100\ kg}\left(\frac{3060}{110}\right)110\ kg \times\right. -$

= 90 (A)

Material Yield Variance = *Average* Standard Price *per unit* of Standard Mix × [Total Standard Quantity (units) – Total Actual Quantity (units)]

$= \left(\frac{2700}{100\ kg}\right) \times (100 - 110\ kg)$

= 270 (A)

Standard Output = Standard Input – Standard Loss

= 100 Kg. – 10 Kg.

= 90 Kg.

Actual Output = 90 Kg.

(Actual Output and Standard Output are always equal numerically in any Material Variance Analysis)

ILLUSTRATION 16

ZCL Ltd. produces one standard product X and operates standard costing and budgetary control system. During the month of February the following information were available:

(i) Direct Materials:

100 tonnes of material A at Rs. 155 per tonne were issued for production. The standard price of A is Rs. 150 per tonne and standard production from each tonne of material A consumed is 50 units.

(ii) Direct Labour:

Skilled and semi-skilled workers are employed in the factory. The budgeted labour- mix is as follows:

Skilled…… 6,000 hours at Rs. 1.50 per hour…Rs. 9,000

Semi-Skilled……10,000 hours at Rs. 1.00 per hour… Rs.10,000

At the end of February an analysis of wages showed the following: Skilled……..6,600 hours at Rs.1.60 per hour…..Rs. 10,560 Semi-Skilled……11,000 hours at Rs. 0.80 per hour…..Rs. 8,800

Failure of power, machine breakdown, etc. resulted in 120 idle hours in respect of skilled workers.

(i) Variable Overhead:

The standard variable overhead rate per unit has been set at Rs. 2. Actual variable overhead for the month was Rs. 11,500.

(ii) Fixed Overhead:

Budgeted Overhead Rs.2,18,750 p.a.

Budgeted Production for the year 62,500 units

Budgeted number of weeks in the year 50 weeks

Actual production (February) 6,000 units

Actual overhead (February) .....Rs. 22,000

(i) Sales:

Product	Budget			Actual		
	Quantity	Price (Rs.)	Value (Rs.)	Quantity	Price (Rs.)	Value (Rs.)
X	5,000	20	1,00,000	4,600	21	96,600

Required

Calculate the necessary variances and prepare a summary thereof with reconciliation statement.

Solution:

BASIC WORKINGS

Standard Output = 5,000 units (100 tonnes x 50 units)

Actual Output = 6,000 units

COMPUTATION OF VARIANCES

Direct Material Variances

COMPUTATION OF VARIANCES

Direct Material Variances

Material Cost Variance = Standard Cost – Actual cost

= 120 tonnes × Rs.150 – 100 tonnes × Rs.155

= Rs.18,000 – Rs.15,500

= Rs. 2,500 (F)

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

= 100 tonnes × (Rs.150 – Rs.155)

= Rs. 500 (A)

Material Usage Variance = Standard Price × (Standard Quantity – Actual Quantity)

= Rs. 150 × (120 tonnes – 100 tonnes)

= Rs. 3,000 (F)

Verification

Material Cost Variance = Material Price Variance + Material Usage Variance

= Rs. 500 (A) + Rs. 3,000 (F)

= Rs. 2,500 (F)

Direct Labour Variances

Category	Standard Cost (6,000 units)			Actual (6,000 units)		
	Hrs.	Rate	Amt.	Hrs.	Rate	Amt.
Skilled	7,200	1.50	10,800	6,600	1.60	10,560
Semi-Skilled	12,000	1.00	12,000	11,000	0.80	8,800
Total	19,200		22,800	17,600		19,360

Labour Rate Variance	= Actual Hours × (Standard Rate - Actual Rate) Skilled
	= 6,600 hours × (Rs.1.50 – Rs.1.60)
	= Rs.660 (A)
Semi-Skilled	= 11,000 hours × (Rs.1.00 – Rs.0.80)
	= Rs.2,200 (F)
Total	= Rs.660 (A) + Rs.2,200 (F)
	= Rs.1,540 (F)
Labour Efficiency Variance	= Standard Rate × (Standard Hours – Actual Hours) Skilled = Rs.1.50 × (7,200 hours – 6,600 hours)
	= 900 (F)
Semi-Skilled	= Rs.1.00 × (12,000 hours – 11,000 hours)
	= 1,000 (F)
Total	= 900 (F) + 1,000 (F)
	= 1,900 (F)
Labour Cost Variance	= Labour Rate Variance + Labour Efficiency Variance
	= 1,540 (F) + 1,900 (F)
	= Rs. 3,440 (F)

Verification

Labour Cost Variance = Standard Cost – Actual Cost

= Rs. 22,800 – Rs.19,360 = Rs. 3,440 (F)

Labour Efficiency Variance may be segregated into:

(i) Idle Time Variance

(ii) Net Efficiency Variance

Or

(i) Idle Time Variance

(ii) Mix Variance

(i) Yield Variances

Idle Time Variance = Standard Rate *per hour* × Actual Idle hours

= Rs.1.50 × 120 hours

= Rs. 180 (A)

Net Efficiency Variance = Standard Rate × (Standard Hours – Actual Hours Worked)

Skilled = Rs.1.50 × (7,200 hours – 6,480 hours)

= Rs.1,080 (F)

Semi-Skilled = Rs.1.00 × (12,000 hours –11,000 hours)

= Rs.1,000 (F)

Total = Rs.1,080 (F) + Rs.1,000 (F)

= Rs. 2,080 (F)

Verification

Labour Efficiency Variance = Idle Time Variance + Net Efficiency Variance

= Rs. 180 (A) + Rs. 2,080 (F)

= Rs. 1,900 (F)

Labour Mix Variance = Total Actual Time Worked (hours) × {Average Standard Rate per hour of Standard Gang Less Average Standard Rate per hour of Actual Gang *(on the basis of hours worked)}*

$= \left(\frac{22{,}800}{19{,}200} - \frac{1.5 \times 6{,}480 \text{ hrs.} + 1.0 \times 11{,}000 \text{hrs}}{17{,}480 \text{ hrs}}\right)$

= 37.50 (F)

Labour Yield Variance = *Average* Standard Rate *per hour* of Standard Gang × {Total Standard Time (hours) Less Total Actual Time *Worked* (hours)}

$\left(\frac{22{,}800}{19{,}200}\right) \times (19200 - 17480 \text{ hrs})$

= 2,042.50 (F)

Verification

Labour Efficiency Variance = Idle Time Variance + Mix Variance + Yield Variance

= Rs. 180 (A) + Rs. 37.50 (F) + 2,042.50 (F)

= Rs. 1,900 (F)

Variable Overhead Variances

Cost Variance = Standard Variable Overheads for Output – Actual Overheads

= Rs. 12,000 – 11,500

= Rs. 500 (F)

Fixed Overhead Variances

Cost Variance = Absorbed Fixed Overheads – Actual Fixed Overheads
= 6,000 units × Rs. 3.50 – Rs. 22,000
= Rs.21,000 – Rs.22,000
= Rs.1,000 (A)

Expenditure Variance = Budgeted Fixed Overheads – Actual Fixed Overheads.
= 5,000 units × Rs.3.50 – Rs.22,000
= Rs.17,500 – Rs.22,000
= Rs.4,500 (A)

Volume Variance = Absorbed Fixed Overheads – Budgeted Overheads
= Rs.21,000 – Rs.17,500
= Rs.3,500 (F)

Verification

Cost Variance = Expenditure Variance + Volume variance
= 4,500 (A) + 3,500 (F)
= 1,000 (A)

Efficiency Variance = Absorbed Fixed Overheads – Budgeted Overheads for Actual Hours

$$= 21{,}000 - 3.50 \times \frac{5000}{16000} \times 17480\ hrs$$

= 1,881.25 (F)

Capacity Variance = Budgeted Fixed Overheads for Actual Hours – Budgeted Fixed Overheads

$$= 3.50 \times \frac{5000\ units}{16000\ hrs} \times 17480 - 17500$$

= 1,618.75 (F)

Verification

Volume Variance = Efficiency Variance + Capacity variance
= Rs. 1,881.25 (F) + Rs. 1,618.75 (F)
= Rs. 3,500 (F)

Sales Variances

Sales Value Variance = Actual Sales – Budgeted Sales
= Rs.96,600 – Rs.1,00,000
= Rs.3,400 (A)

Sales Price Variance = Actual Sales – Standard Sales
= Rs.96,600 – 4,600 units × Rs.20
= 4,600 (F)

Sales Volume Variance = Standard Sales – Budgeted Sales
= Rs.92,000 – Rs.1,00,000
= Rs. 8,000 (A)

SUMMARY OF VARIANCES

Particulars	(Rs)	(Rs)	(Rs)
Direct Material Cost Variance			
Price Variance		500 (A)	
Usage Variance		3,000 (F)	2,500 (F)
Direct Labour Cost Variance			
Rate Variance		1,540 (F)	
Net Efficiency Variance			
Mix Variance	37.50 (F)		
Yield Variance	2,042.50 (F)	2,080 (F)	
Idle Time Variance		180 (A)	3,440 (F)
Variable Overhead Cost Variance			500 (F)
Fixed Overhead Cost Variance			
Expenditure Variance		4,500 (A)	
Volume Variance			
Capacity Variance	1,881.25 (F)		
Efficiency Variance	1,618.75 (F)	3,500 (F)	1,000 (A)
Sales Value Variances			
Price Variance		4,600 (F)	
Volume Variance		8,000 (A)	3,400 (A)
Sales Margin Variances			
Price Variance		4,600 (F)	
Volume Variance		3,080 (A)	1,520 (F)

STANDARD COST *per unit*

Direct Material	3.00
Direct Labour	3.80
Variable Overheads	2.00
Fixed Overheads	3.50
Standard Cost	12.30

RECONCILIATION - BUDGETED AND ACTUAL PROFIT

Budgeted Profit {5,000 units × (Rs.20 – Rs.12.30)}	38,500
Add: Sales Margin Price Variance (F)	4,600
Less: Sales Margin Volume Variance (A)	3,080
Add: Total Cost Variance (F) [Rs.2,500(F)+Rs.3,440(F)+Rs.500(F)+Rs.1,000(A)]	5,440
Actual Net Profit	45,460

VERIFICATION

	Amount
Actual Sales	96,600
Less: Actual Cost	
Materials	15,500
Labour	19,360
Variable Overhead	11,500
Fixed Overhead	22,000
Add: Closing Stock of Finished Goods at Standard Cost [1,400 units x Rs.12.30]	17,220
Actual Net Profit	45,460