

QUESTION 43

A Chemical Company carries on production operation in two processes. The material first pass through Process I, where Product 'A' is produced. Following data are given for the month just ended:

Material input quantity	2,00,000 kg.
Opening work-in-progress quantity (Material 100% and conversion 50% complete)	40,000 kg.
Work completed quantity	1,60,000 kg.
Closing work-in-progress quantity (Material 100% and conversion two-third complete)	30,000 kg.
Material input cost	Rs. 75,000
Processing cost	Rs. 1,02,000
Opening work-in-progress cost:	
Material cost	Rs. 20,000
Processing cost	Rs. 12,000

Normal process loss in quantity may be assumed to be 20% of material input. It has no realisable value. Any quantity of Product 'A' can be sold for Rs. 1.60 per kg. Alternatively, it can be transferred to Process II for further processing and then sold as Product 'AX' for Rs. 2 per kg. Further materials are added in Process II, which yield two kg. of Product 'AX' for every kg. of Product 'A' of Process I. Of the 1,60,000 kg. per month of work completed in Process I, 40,000 kg. are sold as Product 'A' and 1,20,000 kg. are passed through Process II for sale as Product 'AX'. Process II has facilities to handle upto 1,60,000 kg. of Product 'A' per month, if required.

The monthly costs incurred in Process II (other than the cost of Product 'A') are:

	1,20,000 kg. of Product 'A' input (Rs.)	1,60,000 kg. of Product 'A' input (Rs.)
Materials Cost	1,32,000	1,76,000
Processing Costs	1,20,000	1,40,000

Required:

(i) Determine, using the weighted average cost method, the cost per kg. of Product 'A' in Process I and value of both work completed and closing work-in-progress for the month just ended.

(ii) *Is it worthwhile processing 1,20,000 kg. of Product 'A' further?*

(iii) *Calculate the minimum acceptable selling price per kg., if a potential buyer could be found for additional output of Product 'AX' that could be produced with the remaining Product 'A' quantity.*

SOLUTION

**Process- I
Statement of Equivalent Production**

Inputs		Output		Equivalent output			
Particulars	Kg.	Particulars	Kg.	Material		Conversion	
				(%)	kg.	(%)	kg.
Opening W.I.P.	40,000	Normal loss	40,000	--	--	--	--
New material introduced	2,00,000	Units introduced & completed	1,60,000	100	1,60,000	100	1,60,000
		Abnormal loss	10,000	100	10,000	100	10,000
		Closing WIP	30,000	100	30,000	2/3rd	20,000
	2,40,000		2,40,000		2,00,000		1,90,000

**Process- I
Statement of Cost for each element**

Elements of cost	Costs of opening WIP	Costs in process	Total cost	Equivalent units	Cost per Kg.
	(Rs)	(Rs)	(Rs)	Kg.	(Rs)
Material	20,000	75,000	95,000	2,00,000	0.475
Conversion cost	12,000	1,02,000	1,14,000	1,90,000	0.600
	32,000	1,77,000	2,09,000		1.075

**Process- I
Statement of Apportionment of Cost**

Units completed	Elements	Equivalent units (Kg.)	Cost/unit (Rs.)	Cost (Rs.)	Total cost (Rs.)
Work completed	Material	1,60,000	0.475	76,000	1,72,000
	Conversion	1,60,000	0.600	<u>96,000</u>	
Closing WIP	Material	30,000	0.475	14,250	26,250
	Conversion	20,000	0.600	<u>12,000</u>	

(ii) Statement showing comparative data to decide whether 1,20,000 kg. of product 'A' should be processed further into 'AX'.

Alternative I - To sell product 'A' after Process - I

	(Rs.)
Sales 1,20,000 kg. × Rs. 1.60	1,92,000
Less: Cost from Process- I - 1,20,000 kg. × Rs. 1.075	<u>1,29,000</u>
Profit	<u>63,000</u>

Alternative II - Process further into 'AX'

Sales 2,40,000 kg. × Rs. 2.00		4,80,000
Less: Cost from Process- I -1,20,000 kg. × Rs. 1.075	= Rs. 1,29,000	
Material in Process- II	= Rs. 1,32,000	
Processing cost in Process- II	= Rs. <u>1,20,000</u>	<u>3,81,000</u>
Profit		<u>99,000</u>

Hence company should process further

It will increase profit by Rs. 99,000 - Rs. 63,000 = Rs. 36,000

(iii) Calculation of minimum selling price per kg. :

Cost of processing remaining 40,000 kg. further	(Rs.)
Material Rs. 1,76,000 × Rs. 1,32,000	44,000
Processing cost Rs. 1,40,000 - Rs. 1,20,000	20,000
Cost from Process- I relating to 40,000 kg. 'A' (40,000 kg. × Rs. 1.075)	43,000

Benefit foregone if 40,000 kg. 'A' are further Processed 40,000 kg. (Rs.1.60 - Rs. 1.075)	<u>21,000</u>
Total cost	<u>1,28,000</u>
Additional quantity of product 'AX' (40,000 kg. × Rs. 2)	<u>80,000</u>

∴ Minimum selling price $\left(\frac{\text{Rs.1,28,000}}{80,000 \text{ kg.}} \right) = \text{Rs. 1.60}$

QUESTION 44 (RTP May 20, Similar to RTP May 18)

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

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

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

	(Rs.)
Raw Material	46
Labour	14
Overheads	18
	78

Required:

- CALCULATE the quantity (in litres) of raw material inputs during the month.
- CALCULATE the quantity (in litres) of normal loss expected from the process and the quantity (in litres) of abnormal loss / gain experienced in the month.
- CALCULATE the value of raw materials, labour and overheads added to the process during the month.
- PREPARE the process account for the month.

SOLUTION

(i) Calculation of Raw Material inputs during the month:

Quantities Entering Process	Litres	Quantities Leaving Process	Litres
Opening WIP	1,600	Transfer to Finished Goods	8,400
Raw material input (balancing figure)	8,320	Process Losses	1,200
		Closing WIP	320
	9,920		9,920

(ii) Calculation of Normal Loss and Abnormal Loss/Gain

	Litres
Total process losses for month	1,200
Normal Loss (10% input)	832
Abnormal Loss (balancing figure)	368

(iii) Calculation of values of Raw Material, Labour and Overheads added to the process:

	Material	Labour	Overheads
Cost per equivalent unit	Rs. 46.00	Rs. 14.00	Rs. 18.00
Equivalent units (litre) (refer the working note)	7,488	7,744	7,872
Cost of equivalent units	Rs. 3,44,448	Rs. 1,08,416	Rs. 1,41,696
Add: Scrap value of normal loss (832 units × Rs. 15)	Rs. 12,480	--	--
Total value added	Rs. 3,56,928	Rs. 1,08,416	Rs. 1,41,696

Workings:

Statement of Equivalent Units (litre):

Input Details	Units	Output details	Units	Equivalent Production					
				Material		Labour		Overheads	
				Units	(%)	Units	(%)	Units	(%)
Opening WIP	1,600	Units completed:							
Units introduced	8,320	- Opening WIP	1,600	--	--	480	30	640	40
		- Fresh inputs	6,800	6,800	100	6,800	100	6,800	100
		Normal loss	832	--	--	--	--	--	--
		Abnormal loss	368	368	100	368	100	368	100
		Closing WIP	320	320	100	96	30	64	20
	9,920		9,920	7,488		7,744		7,872	

(iv) Process Account for the month

	Litres	Amount (Rs.)		Litres	Amount (Rs.)
To Opening WIP	1,600	1,06,560	By Finished goods [8400 x Rs. 78]	8,400	6,55,200
To Raw Materials	8,320	3,56,928	By Normal loss [832 x Rs. 15]	832	12,480
To Wages	--	1,08,416	By Abnormal loss [368 x Rs. 78]	368	28,704
To Overheads	--	1,41,696	By Closing WIP [(320 x Rs. 46) + (320 x .30 x Rs. 14) + (320 x .20 x Rs. 18)]	320	17,216
	9,920	7,13,600		9,920	7,13,600

Q.	Concept	Pg
45	Joint Cost with Different Method (Sales Value at Split o/s, Physical Measure, NRV, Gross Margin % NRV)	115-118
46	Cost of Inventories (NRV)	119-121
47	Monthly Profitability for Further Processing	122-123
48	Joint Cost/ Split off Point	124-127

QUESTION 45

Pokemon Chocolates manufactures and distributes chocolate products. It purchases Cocoa beans and processes them into two intermediate products:

Chocolate powder liquor base

Milk-chocolate liquor base

These two intermediate products become separately identifiable at a single split off point. Every 500 pounds of cocoa beans yields 20 gallons of chocolate - powder liquor base and 30 gallons of milk-chocolate liquor base.

The chocolate powder liquor base is further processed into chocolate powder. Every 20 gallons of chocolate-powder liquor base yields 200 pounds of chocolate powder. The milk- chocolate liquor base is further processed into milk-chocolate. Every 30 gallons of milk- chocolate liquor base yields 340 pounds of milk chocolate.

Production and sales data for October, 2021 are:

<i>Cocoa beans processed</i>	<i>7,500 pounds</i>
<i>Costs of processing Cocoa beans to split off point (including purchase of beans)</i>	<i>Rs. 7,12,500</i>

	<i>Production</i>	<i>Sales</i>	<i>Selling price</i>
<i>Chocolate powder</i>	<i>3,000 pounds</i>	<i>3,000 pounds</i>	<i>Rs. 190 per pound</i>
<i>Milk chocolate</i>	<i>5,100 Pounds</i>	<i>5,100 Pounds</i>	<i>Rs. 237.50 per pound</i>

The October, 2021 separable costs of processing chocolate-powder liquor into chocolate powder are Rs. 3,02,812.50. The October 2021 separable costs of processing milk-chocolate liquor base into milk-chocolate are Rs. 6,23,437.50.

Pokemon full processes both of its intermediate products into chocolate powder or milk- chocolate. There is an active market for these intermediate products. In October, 2021, Pokemon could have sold the chocolate powder liquor base for Rs. 997.50 a gallon and the milk-chocolate liquor base for Rs. 1,235 a gallon.

Required:

- (i) Calculate how the joint cost of Rs. 7,12,500 would be allocated between the chocolate powder and milk-chocolate liquor bases under the following methods:*
 - (a) Sales value at split off point*
 - (b) Physical measure (gallons)*
 - (c) Estimated net realisable value, (NRV) and*
 - (d) Constant gross-margin percentage NRV.*

- (ii) What is the gross-margin percentage of the chocolate powder and milk-chocolate liquor bases under each of the methods in requirements (i) above?
- (iii) Could Pokemon have increased its operating income by a change in its decision to fully process both of its intermediate products? Show your computations.

SOLUTION

(i) Comparison of alternative Joint-Cost Allocation Methods:

(a) Sales Value at Split-off Point Method

	Chocolate powder liquor base	Milk chocolate liquor base	Total
Sales value of products at split off	Rs. 2,99,250*	Rs. 5,55,750**	Rs. 8,55,000
Weights	0.35	0.65	1.00
Joint cost allocated	Rs. 2,49,375	Rs. 4,63,125	Rs. 7,12,500
	(Rs. 7,12,500 × 0.35)	(Rs. 7,12,500 × 0.65)	

* $(3,000 \text{ lbs} / 200 \text{ lbs}) \times 20 \text{ gallon} \times \text{Rs. } 997.50 = \text{Rs. } 2,99,250$

** $(5,100 \text{ lbs} / 340 \text{ lbs}) \times 30 \text{ gallon} \times \text{Rs. } 1,235 = \text{Rs. } 5,55,750$

(b) Physical Measure Method

	Chocolate powder liquor base	Milk chocolate liquor base	Total
Output	300 gallon*	450 gallon**	750 gallons
Weight	$300/750 = 0.40$	$450/750 = 0.60$	1.00
Joint cost allocated	Rs. 2,85,000	Rs. 4,27,500	Rs. 7,12,500
	(Rs. 7,12,500 × 0.40)	(Rs. 7,12,500 × 0.60)	

* $(3,000 \text{ lbs} / 200 \text{ lbs}) \times 20 \text{ gallon} = 300 \text{ gallon}$

** $(5,100 \text{ lbs} / 340 \text{ lbs}) \times 30 \text{ gallon} = 450 \text{ gallon}$

(c) Net Realisable Value (NRV) Method

	Chocolate powder liquor base	Milk chocolate liquor base	Total
Final sales value of production	Rs. 5,70,000 (3,000 lbs × Rs. 190)	Rs. 12,11,250 (5,100 lbs × Rs. 237.50)	Rs. 17,81,250
Less: Separable costs	Rs. 3,02,812.50	Rs. 6,23,437.50	Rs. 9,26,250
Net realisable value at split off point	Rs. 2,67,187.50	Rs. 5,87,812.50	Rs. 8,55,000
Weight	0.3125 (2,67,187.50 / 8,55,000)	0.6875 (5,87,812.5 / 8,55,000)	1.00
Joint cost allocated	Rs. 2,22,656.25 (Rs. 7,12,500 × 0.3125)	Rs. 4,89,843.75 (Rs. 7,12,500 × 0.6875)	Rs. 7,12,500

(d) Constant Gross Margin (%) NRV method

	Chocolate powder Liquor base	Milk chocolate liquor Base	Total
Final sales value of production	Rs. 5,70,000	Rs. 12,11,250	Rs. 17,81,250
Less: Gross margin* 8%	Rs. 45,600	Rs. 96,900	Rs. 1,42,500
Cost of goods available for sale	Rs. 5,24,400	Rs. 11,14,350	Rs. 16,38,750
Less: Separable costs	Rs. 3,02,812.50	Rs. 6,23,437.50	Rs. 9,26,250
Joint cost allocated	Rs. 2,21,587.50	Rs. 4,90,912.50	Rs. 7,12,500

*Final sales value of total production = Rs. 17,81,250
 Less: Joint and separable cost = Rs. 16,38,750 (Rs. 7,12,500 + Rs. 9,26,250)
 Gross Margin = Rs. 1,42,500
 Gross margin (%) = $\frac{\text{Rs. 1,42,500}}{\text{Rs. 17,81,250}} \times 100 = 8\%$

(ii) Chocolate powder liquor base

(Amount in Rs.)

	Sales value at Split off	Physical Measure	Estimated net Realisable Value	Constant Gross Margin NRV
Final sale value of Chocolate powder	5,70,000	5,70,000	5,70,000	5,70,000
Less: Separable costs	3,02,812.50	3,02,812.50	3,02,812.50	3,02,812.50
Less: Joint costs	2,49,375	2,85,000	2,22,656.25	2,21,587.50
Gross Margin	17,812.50	(17,812.50)	44,531.25	45,600
Gross Margin %	3.125%	(3.125%)	7.8125%	8.00%

Milk chocolate liquor base

(Amount in Rs.)

	Sales value at split off	Physical measure	Estimated net realisable	Constant Gross margin NRV
Final sale value of milk chocolate	12,11,250	12,11,250	12,11,250	12,11,250
Less: Separable costs	6,23,437.50	6,23,437.50	6,23,437.50	6,23,437.50
Less: Joint costs	4,63,125	4,27,500	4,89,843.75	4,90,912
Gross Margin	1,24,687.50	1,60,312.50	97,968.75	96,900.50
Gross Margin %	10.29%	13.24%	8.09%	8.00%

(iii) Further processing of Chocolate powder liquor base in Chocolate powder

	(Amount in Rs.)
Incremental revenue {Rs. 5,70,000 - (Rs. 997.50 × 300 gallon)}	2,70,750
Less: Incremental costs	3,02,812.50
Incremental operating income	(32,062.50)

Further processing of Milk Chocolate liquor base into Milk Chocolate.

	(Amount in Rs.)
Incremental revenue {Rs. 12,11,250 - (Rs. 1,235 × 450 gallon)}	6,55,500
Less: Incremental cost	6,23,437.50
Incremental operating income	32,062.50

The above computations show that Pokemon Chocolates could increase operating income by Rs. 32,062.50 if chocolate liquor base is sold at split off point and milk chocolate liquor base is processed further.

QUESTION 46 (RTP Nov' 20)

ABC Ltd. operates a simple chemical process to convert a single material into three separate items, referred to here as X, Y and Z. All three end products are separated simultaneously at a single split-off point.

Product X and Y are ready for sale immediately upon split off without further processing or any other additional costs. Product Z, however, is processed further before being sold. There is no available market price for Z at the split-off point.

The selling prices quoted here are expected to remain the same in the coming year. During 2020-21, the selling prices of the items and the total amounts sold were:

X - 186 tons sold for Rs. 1,500 per ton

Y - 527 tons sold for Rs. 1,125 per ton

Z - 736 tons sold for Rs. 750 per ton

The total joint manufacturing costs for the year were Rs 6,25,000. An additional Rs.3,10,000 was spent to finish product Z.

There were no opening inventories of X, Y or Z at the end of the year. The following inventories of complete units were on hand:

X 180 tons

Y 60 Tons

Z 25 tons

There was no opening or closing work-in-process.

Required:

Compute the cost of inventories of X, Y and Z and cost of goods sold for income statement purpose as of March 31, 2021, using Net realizable value (NRV) method of joint cost allocation.

Student Notes

SOLUTION

(a) Statement of Joint Cost allocation of inventories of X, Y and Z

(By using Net Realisable Value Method)

	Products			Total (Rs.)
	X	Y	Z	
	(Rs.)	(Rs.)	(Rs.)	
Final sales value of total production (Working Note 1)	5,49,000 (366 x Rs. 1,500)	6,60,375 (587 x Rs.1,125)	5,70,750 (761 x Rs. 750)	17,80,125
Less: Additional cost	--	--	3,10,000	3,10,000
Net realisable value (at split-off point)	5,49,000	6,60,375	2,60,750	14,70,125
Joint cost allocated (Working Note 2)	2,33,398	2,80,748	1,10,854	6,25,000

(b) Cost of goods sold for income statement purpose as of March 31, 2021 (By using Net Realisable Value Method)

	Products			Total (Rs.)
	X	Y	Z	
	(Rs.)	(Rs.)	(Rs.)	
Allocated joint cost	2,33,398	2,80,748	1,10,854	6,25,000
Additional costs	--	--	3,10,000	3,10,000
Cost of goods available for sale (CGAS)	2,33,398	2,80,748	4,20,854	9,35,000
Less: Cost of ending inventory (Working Note 1)	1,14,785 (CGAS × 49.18%)	28,692 (CGAS × 10.22%)	13,846 (CGAS × 3.29%)	1,57,323
Cost of goods sold	1,18,613	2,52,056	4,07,008	7,77,677

Working Notes

1. Total production of three products for the year 2020-2021

Products	Quantity sold in tones	Quantity of ending inventory in tons	Total production	Ending inventory percentage (%)
(1)	(2)	(3)	(4) = [(2) + (3)]	(5) = (3)/ (4)
X	186	180	366	49.18
Y	527	60	587	10.22
Z	736	25	761	3.29

2. Joint cost apportioned to each product:

$$\frac{\text{Total Joint Cost}}{\text{Total Net Realisable Value}} \times \text{Rs. } 10,98,000 = \text{Rs. } 4,66,797$$

$$\text{Total Cost of Product X} = \frac{\text{Rs. } 12,50,000}{\text{Rs. } 29,40,250} \times \text{Rs. } 10,98,000 = \text{Rs. } 4,66,797$$

$$\text{Total Cost of Product Y} = \frac{\text{Rs. } 12,50,000}{\text{Rs. } 29,40,250} \times \text{Rs. } 13,20,750 = \text{Rs. } 5,61,496$$

$$\text{Total Cost of Product Z} = \frac{\text{Rs. } 12,50,000}{\text{Rs. } 29,40,250} \times \text{Rs. } 5,21,500 = \text{Rs. } 2,21,707$$

QUESTION 46

A company's plant processes 1,50,000 kg. of raw material in a month to produce two products, viz, 'P' and 'Q'. The cost of raw material is Rs. 12 per kg. The processing costs per month are:

	(Rs.)
Direct Materials	90,000
Direct Wages	1,20,000
Variable Overheads	1,00,000
Fixed Overheads	1,00,000

The loss in process is 5% of input and the output ratio of P and Q which emerge simultaneously is 1:2. The selling prices of the two products at the point of split off are: P Rs. 12 per kg. and Q Rs. 20 per kg. A proposal is available to process P further by mixing it with other purchased materials. The entire current output of the plant can be so processed further to obtain a new product 'S'. The price per kg. of S is Rs. 15 and each kg of output of S will require one kilogram of input P. The cost of processing of P into S (including other materials) is Rs. 1,85,000 per month.

You are required to prepare a statement showing the monthly profitability based both on the existing manufacturing operations and on further processing.

Will you recommend further processing?

SOLUTION

Working Notes:

	(Kg.)
Material input	1,50,000
Less: Loss of Material in process (5% of 1,50,000 kg.)	7,500
Total output	1,42,500

2. Output of P and Q are in the ratio of 1 : 2 of the total output

$$P = \frac{1,42,500 \text{ Kg.} \times 1}{3} = 47,500 \text{ kg.}$$

$$Q = \frac{1,42,500 \text{ kg.} \times 2}{3} = 95,000 \text{ kg.}$$

3. Joint Costs:

	(Rs.)
Material (input) (1,50,000 kg. × Rs. 12)	18,00,000
Direct materials	90,000
Direct Wages	1,20,000
Variable overheads	1,00,000
Fixed overheads	1,00,000
	22,10,000

4. Sales Revenue of P, Q and S
 $P = 47,500 \text{ Kg.} \times \text{Rs. } 12 = \text{Rs. } 5,70,000$
 $Q = 95,000 \text{ Kg.} \times \text{Rs. } 20 = \text{Rs. } 19,00,000$
 $S = 47,500 \text{ Kg.} \times \text{Rs. } 15 = \text{Rs. } 7,12,500.$
5. Apportionment of joint costs viz. Rs. 22,10,000 over P and Q in proportion of their sales value i.e. Rs. 5,70,000 and Rs. 19,00,000, i.e., 3 : 10 is:

	Total (Rs.)	P (Rs.)	Q (Rs.)
Joint cost apportionment In the ratio of 3 : 10	22,10,000	5,10,000 $\left(\frac{\text{Rs. } 22,10,000 \times 3}{13} \right)$	17,00,000 $\left(\frac{\text{Rs. } 22,10,000 \times 10}{13} \right)$

6. Total Cost of 47,500 kg. of S = Joint Cost of P + Cost of Processing P into S. = Rs. 5,10,000 + Rs. 1,85,000 = Rs. 6,95,000.

Statement showing the Monthly Profitability

	Based on existing manufacturing operations			Based on further processing of P into S		
	Products			Products		
	P	Q	Total	S	Q	Total
Sales quantity (kg.)	47,500	95,000	1,42,500	47,500	95,000	1,42,500
	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Sales Revenue (Working Note 4)	5,70,000	19,00,000	24,70,000	7,12,500	19,00,000	26,12,500
Less: Joint Costs (Working Note 5)	5,10,000	17,00,000	22,10,000	6,95,000*	17,00,000	23,95,000
Profit	60,000	2,00,000	2,60,000	17,500	2,00,000	2,17,500

*Working Note 6

Recommendation: Further processing of P is not recommended as it results in a lower profit of P.

QUESTION 47

SV chemicals Limited processes 9,00,000 kgs. of raw material in a month purchased at Rs. 95 per kg in department X. The input output ratio of department X is 100 : 90. Processing of the material results in two joint products being produced 'P1' and 'P2' in the ratio of 60 : 40. Product 'P1' can be sold at split off stage or can be further processed in department Y and sold as a new product 'YP1'. The input output ratio of department Y is 100 : 95. Department Y is utilized only for further processing of product 'P1' to product 'YP1'. Individual departmental expenses are as follows:

	Dept. X (Rs. lakhs)	Dept. Y (Rs. lakhs)
Direct Materials	95.00	14.00
Direct Wages	80.00	27.00
Variable Overheads	100.00	35.00
Fixed Overheads	75.00	52.00
Total	350.00	128.00

Further, selling expenses to be incurred on three products are:

Particulars	Amount (Rs. in lakhs)
Product 'P1'	28.38
Product 'P2'	25.00
Product 'YP1'	19.00

Selling price of the products 'P1' and 'P2' at split off point is Rs. 110 per kg and Rs. 325 per kg respectively. Selling price of new product 'YP1' is Rs. 150 per kg.

You are required to:

- Prepare a statement showing apportionment of joint costs, in the ratio of value of sales, net of selling expenses.
- Statement showing profitability at split off point.
- Statement of profitability of 'YP1'.
- Would you recommend further processing of P1?

SOLUTION

Working Notes:

Input output ratio of material processed in Department X = 100 : 90

Particulars	Quantity (Kg)
Material input	9,00,000
Less: Loss of material in process @ 10% of 9,00,000 kgs	90,000
Output	8,10,000

Output of department X is product 'P1' and 'P2' in the ratio of 60 : 40.

Output 'P1' = $\frac{60 \times 8,10,000}{100} = 4,86,000$ kgs.

Output 'P2' = $\frac{40 \times 8,10,000}{100} = 3,24,000$ kgs.

Statement showing ratio of net sales

Product	P1	P2	Total
Quantity (kgs)	4,86,000	3,24,000	8,10,000
Selling price per kg (Rs.)	110.00	325.00	
Sales Value (Rs. Lakhs)	534.60	1,053.00	1,587.60
Less: Selling Expenses	28.38	25.00	53.38
Net Sales	506.22	1,028.00	1,534.22
Ratio	33%	67%	100.00

Computation of Joint Costs

Particulars	Amount (Rs. Lakhs)
Raw Material input 9,00,000 kgs @ Rs. 95 per kg	855.00
Direct Materials	95.00
Direct Wages	80.00
Variable Overheads	100.00
Fixed Overheads	75.00
Total	1,205.00

(i) Statement showing apportionment of joint costs in the ratio of net sales

Particulars	Amount (Rs. In lakhs)
Joint cost of P1 - 33% of Rs.1,205 lakhs	397.65
Joint cost of P2 - 67% of Rs. 1,205 lakhs	807.35
Total	1,205.00

(ii) Statement showing profitability at split off point

Product	P1	P2	Total
Net Sales Value (Rs. in lakhs) - [A]	506.22	1028.00	1534.22
Less: Joint costs (Rs. in lakhs)	397.65	807.35	1205.00
Profit (Rs. in lakhs) [A] - [B]	108.57	220.65	329.22

(iii) Statement of profitability of product 'YP1

Particulars		YP1
Sales Value (Rs. In lakhs) [A]		629.55
Less: Cost of P1	397.65	807.35
Cost of Department Y	128.00	
Selling Expenses of Product 'YP1'	19.00	
Total Costs [B]		544.65
Profit (Rs. In Lakhs) [A] - [B]		147.90

Working Note: Computation of Product 'YP1'

Quantity of product P1 input used = 4,86,000 kgs

Input output ratio of material processed in Department Y = 100 : 95

Particulars	Quantity (Kg)
Material input	4,86,000
Less: Loss of material in process @ 5% of 4,86,000	24,300
Output	4,61,700

Sales Value of YP1 = 4,61,700 kgs @ Rs. 150 per kg = Rs. 692.55 lakhs

- (iv) Further processing of product P1 and converting to product YP1 is beneficial as the profit of the company increases by Rs. 39.33 lakhs.

Working Note:

Profit of Product 'YP1'	Rs. 147.90L
Profit of Product 'P1'	Rs. 108.57L
Increase in profit after further processing	Rs. 39.33 L

Q.	Concept	Pg
49	Calculation of Absolute & Commercial MT-KM	128-130
50	Service Cost of a School	131-134
51	Service Cost of a Hospital	135-137

QUESTION 49

GTC has a lorry of 6-ton carrying capacity. It operates lorry service from city A to city B. It charges Rs. 2,400 per ton from city 'A' to city 'B' and Rs. 2,200 per ton for the return journey from city 'B' to city 'A'. Goods are also delivered to an intermediate city 'C' but no concession or reduction in rates is given. Distance between the city 'A' to 'B' is 300 km and distance from city 'A' to 'C' is 140 km.

In January 2020, the truck made 12 outward journeys for city 'B'. The details of journeys are as follows:

Outward journey	No. of journeys	Load (in ton)
'A' to 'B'	10	6
'A' to 'C'	2	6
'C' to 'B'	2	4
Return journey	No. of journeys	Load (in ton)
'B' to 'A'	5	8
'B' to 'A'	6	6
'B' to 'C'	1	6
'C' to 'A'	1	0

Annual fixed costs and maintenance charges are ₹ 6,00,000 and ₹ 1,20,000 respectively. Running charges spent during January 2020 are ₹ 2,94,400 (includes ₹ 12,400 paid as penalty for overloading).

You are required to:

- (i) CALCULATE the cost as per (a) Commercial ton-kilometre. (b) Absolute ton-kilometre
- (ii) CALCULATE Net Profit/ loss for the month of January, 2020.

SOLUTION

(i) Calculation of total monthly cost for running truck:

Particulars	Amount per annum (Rs.)	Amount per month (Rs.)
(i) Standing Charges:		
Annual fixed costs	6,00,000	50,000
(ii) Maintenance Charges:	1,20,000	10,000
(iii) Running Cost:		
Running charges	2,94,400	
Less: Penalty paid for overloading	(12,400)	2,82,000
Total monthly cost		3,42,000

(a) Cost per commercial ton-km = $\frac{\text{Rs. } 3,42,000}{44,856 \text{ ton-km.}}$ = Rs. 7.62

(Refer to working note-1)

(b) Cost per absolute ton-km. = $\frac{\text{Rs. } 3,42,000}{44,720 \text{ ton-km.}}$ = Rs. 7.65

(Refer to working note-2)

(ii) Calculation of Net Profit/Loss for the month of January 2020:

Particulars	(Rs.)	(Rs.)
Truck hire charges received during the month:		
From Outward journey (12 trips × 6 ton × Rs. 2,400)	1,72,800	
From return journey {(5 trips × 8 ton × ₹ 2,200) + (7 trips × 6 ton × Rs. 2,200)}	1,80,400	3,53,200
Less: Monthly running cost {as per (i) above}		(3,42,000)
Operating profit		11,200
Less: Penalty paid for overloading		(12,400)
Net Loss for the month		(1,200)

Working Notes:

1. Calculation of Commercial Ton-km:

Particulars		Ton-km.
A. Total Distance travelled		
To and fro (300 km × 2 × 12 trips) (in km)		7,200
B. Average weight carried:		
Outward (12 journeys × 6 ton + 2 journeys × 4 ton)	80	
Return (5 journeys × 8 ton + 6 journeys × 6 ton + 1 journey × 6 ton)	82	
Total weight	162	
No. of journeys	26	
Average weight (in ton) (162 ÷ 26)	6.23	
Total Commercial Ton-km (A × B)		44,856

2. Calculation of Absolute Ton-km:

Particulars	Ton-km.	Ton-km.
Outward journeys:		
From city A to city B (10 journey × 300 km. × 6 ton)	18,000	
From city A to city C (2 journeys × 140 km. × 6 ton)	1,680	
From city C to city B (2 journeys × 160 km. × 4 ton)	1,280	20,960
Return journeys:		
From city B to city A (5 journeys × 300 km. × 8 ton) + (6 journeys × 300 km. × 6 ton)	22,800	
From city B to city C (1 journey × 160 km. × 6 ton)	960	23,760
Total Absolute Ton-km		44,720

Note: (i) While calculating absolute/commercial ton-km., actual load carried are considered irrespective of the fact it attracts fines or penalty. (ii) Penalty paid for overloading is an abnormal expenditure and is not included in the operating cost of the bus. This amount will be debited to Costing Profit and Loss A/c and hence deducted from operating profit to arrive at net profit/loss.

QUESTION 50 (Similar to RTP May 18, May 20)

AD Higher Secondary School (AHSS) offers courses for 11th & 12th standard in three streams i.e. Arts, Commerce and Science. AHSS runs higher secondary classes along with primary and secondary classes, but for accounting purpose it treats higher secondary as a separate responsibility centre. The Managing committee of the school wants to revise its fee structure for higher secondary students. The accountant of the school has provided the following details for a year:

	Amount (Rs.)
Teachers' salary (25 teachers × Rs. 35,000 × 12 months)	1,05,00,000
Principal's salary	14,40,000
Lab attendants' salary (2 attendants × Rs. 15,000 × 12 months)	3,60,000
Salary to library staff	1,44,000
Salary to peons (4 peons × Rs. 10,000 × 12 months)	4,80,000
Salary to other staffs	4,80,000
Examinations expenditure	10,80,000
Office & Administration cost	15,20,000
Annual day expenses	4,50,000
Sports expenses	1,20,000

Other information:

(i)

	Standard 11 & 12			Primary & Secondary
	Arts	Commerce	Science	
No. of students	120	360	180	840
Lab classes in a year	0	0	144	156
No. of examinations in a year	2	2	2	2
Time spent at library per student per year	180 hours	120 hours	240 hours	60 hours
Time spent by principal for administration	208 hours	312 hours	480 hours	1,400 hours
Teachers for 11 & 12 standard	4	5	6	10

- (ii) One teacher who teaches economics for Arts stream students also teaches commerce stream students. The teacher takes 1,040 classes in a year, it includes 208 classes for commerce students.
- (iii) There is another teacher who teaches mathematics for Science stream students also teaches business mathematics to commerce stream students. She takes 1,100 classes a year, it includes 160 classes for commerce students.
- (iv) One peon is fully dedicated for higher secondary section. Other peons dedicate their 15% time for higher secondary section.
- (v) All school students irrespective of section and age participates in annual functions and sports activities.

Required:

- (a) CALCULATE cost per student per annum for all three streams.
- (b) If the management decides to take uniform fee of Rs. 1,000 per month from all higher secondary students, CALCULATE stream wise profitability.
- (c) If management decides to take 10% profit on cost, COMPUTE fee to be charged from the students of all three streams respectively.

SOLUTION

Calculation of Cost per annum

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)	Total (Rs.)
Teachers' salary (W.N-1)	16,80,000	21,00,000	25,20,000	63,00,000
Re-apportionment of Economics & Mathematics teachers' salary (W.N_2)	(84,000)	1,45,091	(61,091)	-
Principal's salary (W.N-3)	1,24,800	1,87,200	2,88,000	6,00,000
Lab assistants' salary (W.N-4)	-	-	1,72,800	1,72,800
Salary to library staff (W.N-5)	43,200	28,800	57,600	1,29,600
Salary to peons (W.N-6)	31,636	94,909	47,455	1,74,000
Salary to other staffs (W.N-7)	38,400	1,15,200	57,600	2,11,200

Examination expenses (W.N- 8)	86,400	2,59,200	1,29,600	4,75,200
Office & Administration expenses (W.N- 7)	1,21,600	3,64,800	1,82,400	6,68,800
Annual Day expenses (W.N-7)	36,000	1,08,000	54,000	1,98,000
Sports expenses (W.N- 7)	9,600	28,800	14,400	52,800
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400

(i) Calculation of cost per student per annum

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)	Total (Rs.)
Total Cost per annum	20,87,636	34,32,000	34,62,764	89,82,400
No. of students	120	360	180	660
Cost per student per annum	17,397	9,533	19,238	13,610

(ii) Calculation of profitability

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)	Total (Rs.)
Total Fees per annum	12,000	12,000	12,000	
Cost per student per annum	17,397	9,533	19,238	
Profit/ (Loss) per student per annum	(5,397)	2,467	(7,238)	
No. of students	120	360	180	
Total Profit/ (Loss)	(6,47,640)	8,88,120	(13,02,840)	(10,62,360)

(iii) Computation of fees to be charged to earn a 10% profit on cost

Particulars	Arts (Rs.)	Commerce (Rs.)	Science (Rs.)
Cost per student per annum	17,397	9,533	19,238
Add: Profit @10%	1,740	953	1,924
Fees per annum	19,137	10,486	21,162
Fees per month	1,595	874	1,764

Working Notes:

(1) Teachers' salary

Particulars	Arts	Commerce	Science
No. of teachers	4	5	6
Salary per annum (Rs.)(Rs. 35,000 × 12)	4,20,000	4,20,000	4,20,000
Total salary	16,80,000	21,00,000	25,20,000

(2) Re-apportionment of Economics and Mathematics teachers' salary

Particulars	Economics		Mathematics	
	Arts	Commerce	Science	Commerce
No. of classes	832	208	940	160
Salary re- apportionment (Rs.)	(84,000)	84,000	(61,091)	61,091
	$\frac{\text{Rs.4,20,000}}{1,040} \times 208$		$\frac{\text{Rs.4,20,000}}{1,100} \times 160$	

(3) Principal's salary has been apportioned on the basis of time spent by him for administration of classes.

(4) Lab attendants' salary has been apportioned on the basis of lab classes attended by the students.

(5) Salary of library staffs are apportioned on the basis of time spent by the students in library.

(6) Salary of Peons are apportioned on the basis of number of students. The peons' salary allocable to higher secondary classes is calculated as below:

	Amount (Rs.)
Peon dedicated for higher secondary (1 peon × Rs.10,000 × 12 months)	1,20,000
Add: 15% of other peons' salary {15% of (3 peons × Rs.10,000 × 12 months)}	54,000
	1,74,000

(7) Salary to other staffs, office & administration cost, Annual day expenses and sports expenses are apportioned on the basis of number of students.

(8) Examination expenditure has been apportioned taking number of students into account (It may also be apportioned on the basis of number of examinations).

QUESTION 51 (Similar to Past Paper May 18)

ABC Hospital runs a Critical Care Unit (CCU) in a hired building. CCU consists of 35 beds and 5 more beds can be added, if required.

Rent per month - Rs. 75,000

Supervisors - 2 persons - Rs. 25,000 Per month - each

Nurses - 4 persons - Rs.20,000 per month - each

Ward Boys - 4 persons - Rs. 5,000 per month - each

Doctors paid Rs. 2,50,000 per month - paid on the basis of number of patients attended and the time spent by them

Other expenses for the year are as follows:

Repairs (Fixed) - Rs. 81,000

Food to Patients (Variable) - Rs. 8,80,000

Other services to patients (Variable) - Rs. 3,00,000

Laundry charges (Variable) - Rs. 6,00,000

Medicines (Variable) - Rs. 7,50,000

Other fixed expenses - Rs.10,80,000

Administration expenses allocated - Rs. 10,00,000

It was estimated that for 150 days in a year 35 beds are occupied and for 80 days only 25 beds are occupied.

The hospital hired 750 beds at a charge of Rs. 100 per bed per day, to accommodate the flow of patients. However, this does not exceed more than 5 extra beds over and above the normal capacity of 35 beds on any day.

You are required to -

- (a) CALCULATE profit per Patient day, if the hospital recovers on an average Rs. 2,000 per day from each patient
- (b) FIND OUT Breakeven point for the hospital.

Student Notes

SOLUTION

Working notes:

(i) Calculation of number of Patient days

35 Beds × 150 days	=	5,250
25 Beds × 80 days	=	2,000
Extra beds	=	<u>750</u>
Total	=	<u>8,000</u>

Statement of Profitability

Particulars	Amount	Amount
Income for the year (Rs. 2,000 per patient perday × 8,000 patient days)		1,60,00,000
Variable Costs:		
Doctor Fees (Rs. 2,50,000 per month × 12)	30,00,000	
Food to Patients (Variable)	8,80,000	
Other services to patients (Variable)	3,00,000	
Laundry charges (Variable) - (Rs.)	6,00,000	
Medicines (Variable) - (Rs.)	7,50,000	
Bed Hire Charges (Rs.100 × 750 Beds)	75,000	
Total Variable costs		56,05,000
Contribution		1,03,95,000
Fixed Costs:		
Rent (Rs. 75,000 per month × 12)	9,00,000	
Supervisor (2 persons × Rs.25,000 × 12)	6,00,000	
Nurses (4 persons × Rs. 20,000 × 12)	9,60,000	
Ward Boys (4 persons × Rs. 5,000 × 12)	2,40,000	
Repairs (Fixed)	81,000	
Other fixed expenses - (Rs.)	10,80,000	
Administration expenses allocated - (Rs.)	10,00,000	
Total Fixed Costs		48,61,000
Profit		55,34,000

(1) Calculation of Contribution per Patient day

Total Contribution - Rs. 1,03,95,000

Total Patient days - 8,000

Contribution per Patient day - Rs. 1,03,95,000 / 8,000 = Rs. 1,299.375

(2) Breakeven Point = Fixed Cost / Contribution per Patient day

= Rs. 48,61,000 / Rs.1,299.375

= 3,741 patient days

Q.	Concept	Pg
52	Material & Labour Variances	138-140
53	Fixed & Variable Variance	141-143
54	All Variances	144-145

QUESTION 52

KPR Limited operates a system of standard costing in respect of one of its products which is manufactured within a single cost centre. The Standard Cost Card of a product is as under:

Standard		Unit cost (Rs.)
Direct material	5 kg. @ Rs. 4.20	21.00
Direct labour	3 hours @ Rs. 3.00	9.00
Factory overhead	Rs. 1.20 per labour hour	3.60
Total manufacturing cost		33.60

The production schedule for the month of June, 2013 required completion of 40,000 units. However, 40,960 units were completed during the month without opening and closing work-in-process inventories.

Purchases during the month of June, 2013, 2,25,000 kg. of material at the rate of Rs. 4.50 per kg. Production and Sales records for the month showed the following actual results.

Material used	2,05,600 kg.
Direct labour 1,21,200 hours; cost incurred	Rs.3,87,840
Total factory overhead cost incurred	Rs.1,00,000
Sales	40,000 units

Selling price to be so fixed as to allow a mark-up of 20 percent on selling price.

The production schedule for the month of June, 2013 required completion of 40,000 units. However, 40,960 units were completed during the month without opening and closing work-in-process inventories.

Purchases during the month of June, 2013, 2,25,000 kg. of material at the rate of Rs. 4.50 per kg. Production and Sales records for the month showed the following actual results.

Material used	2,05,600 kg.
Direct labour 1,21,200 hours; cost incurred	Rs.3,87,840
Total factory overhead cost incurred	Rs.1,00,000
Sales	40,000 units

Selling price to be so fixed as to allow a mark-up of 20 percent on selling price.

Required:

- (i) Calculate material variances based on consumption of material.
- (ii) Calculate labour variances and the total variance for factory overhead.
- (iii) Prepare Income statement for June, 2013 showing actual gross margin.
- (iv) An incentive scheme is in operation in the company whereby employees are paid a bonus of 50% of direct labour hour saved at standard direct labour hour rate. Calculate the Bonus amount.

SOLUTION

(i) Material variances:

- (a) **Material Cost Variance** = Standard Cost - Actual Cost
 = (40,960 units × 5 kg. × Rs. 4.20) - (2,05,600 kg. × Rs.4.50)
 = Rs. 8,60,160 - Rs. 9,25,200 = Rs. 65,040 (A)
- (b) **Material Price Variance** = Actual Qty. (Std.Price - Actual Price)
 = 2,05,600* kg. (Rs. 4.20 - Rs.4.50)
 = Rs. 61,680 (A)

(*Material variances are calculated on the basis of consumption)

- (c) **Material Usages Variance** = Std. Price (Std. Qty. - Actual Qty.)
 = Rs. 4.20 (40,960 units × 5 kg. - 2,05,600 kg.)
 = Rs. 3,360 (A)

(ii) Labour Variances and Overhead Variances:

- (a) **Labour Cost Variance** = Standard cost - Actual cost
 = (40,960 units × 3 hours × Rs. 3) - Rs. 3,87,840
 = Rs.19,200 (A)
- (b) **Labour Rate Variance** = Actual Hours (Std. Rate - Actual Rate)
 = 1,21,200 hours (Rs. 3 - Rs. 3.20)
 = Rs. 24,240 (A)
- (c) **Labour Efficiency Variance** = Std. Rate (Std. Hour - Actual Hour)
 = Rs. 3 (40,960 units × 3 hour - 1,21,200 hour)
 = Rs. 5,040 (F)
- (d) **Total Factory Overhead Variance**
 = Factory Overhead Absorbed - Actual Factory Overhead
 = (Actual Hours × Std. Rate) - Actual Factory Overhead
 = (40,960 units × 3 hours × Rs.1.20) - Rs.1,00,000
 = Rs. 47,456 (F)

(iii) Preparation of Income Statement

Calculation of unit selling price	(Rs.)
Direct material	21.00
Direct labour	9.00
Factory overhead	3.60
Factory cost	33.60
Margin 25% on factory cost	8.40
Selling price	42.00

Income Statement

	(Rs.)	(Rs.)
Sales (40,000 units × Rs. 42)		16,80,000
Less: Standard cost of goods sold (40,000 units × Rs.33.60)		13,44,000
		3,36,000
Less: Adverse Variances:		
Material Price variance	61,680	
Material Usage variance	3,360	
Labour Rate variance	24,240	89,280
		2,46,720
Add:Favourable variances:		
Labour efficiency variance	5,040	
Factory overhead	47,456	52,496
Actual gross margin		2,99,216

(iv)

Labour hour saved	(Rs.)
Standard labour hours (40,960 units × 3 hours)	1,22,880
Actual labour hour worked	1,21,200
Labour hour saved	1,680

Bonus for saved labour = 50% (1,680 hours × Rs. 3) = Rs. 2,520

QUESTION 53

XYZ Ltd. has furnished you the following information for the month of August, 2020:

	<i>Budget</i>	<i>Actual</i>
<i>Output (units)</i>	30,000	32,500
<i>Hours</i>	30,000	33,000
<i>Fixed overhead</i>	Rs.45,000	50,000
<i>Variable overhead</i>	Rs.60,000	68,000
<i>Working days</i>	25	26

CALCULATE overhead variances.

SOLUTION

$$\text{Standard hours per unit} = \frac{\text{Budgeted hours}}{\text{Budgeted units}} = \frac{30,000 \text{ Hrs}}{30,000 \text{ Units}} = 1 \text{ hour per unit}$$

$$\text{Std. hrs. for actual output} = 32,500 \text{ units} \times 1 \text{ hr.} = 32,500$$

$$\text{Standard overhead rate per hour} = \frac{\text{Budgeted overhead}}{\text{Budgeted hours}}$$

$$\text{For fixed overhead} = \frac{45,000}{30,000} = \text{Rs. } 1.50 \text{ per hour}$$

$$\text{For Variable Overhead} = \frac{60,000}{30,000} = \text{Rs. } 2 \text{ per hour}$$

$$\text{Std. F.O. rate per day} = \text{Rs. } 45,000 \div 25 \text{ days} = \text{Rs. } 1,800$$

$$\text{Recovered overhead} = \text{Std. hrs. for actual output} \times \text{Std. rate}$$

$$\text{For fixed overhead} = 32,500 \text{ hrs.} \times \text{Rs. } 1.50 = \text{Rs. } 48,750$$

$$\text{For variable overhead} = 32,500 \text{ hrs.} \times \text{Rs. } 2 = \text{Rs. } 65,000$$

$$\text{Standard overhead} = \text{Actual hours} \times \text{Std. rate}$$

$$\text{For fixed overhead} = 33,000 \times 1.50 = \text{Rs. } 49,500$$

$$\text{For variable overhead} = 33,000 \times 2 = \text{Rs. } 66,000$$

$$\text{Revised budget hours} = \frac{\text{Budgeted hours} \times \text{Actual days}}{\text{Budgeted days}}$$

$$= \frac{30,000 \times 26}{25} = 31,200 \text{ hours}$$

Calculation of variances**Fixed Overhead Variances:**

- (i) F.O. cost Variance = Recovered Overhead - Actual Overhead
= 48,750 - 50,000
= Rs. 1,250 (A)
- (ii) F.O. Expenditure Variance = Budgeted Overhead - Actual Overhead
= 45,000 - 50,000
= Rs. 5,000 (A)
- (iii) F.O. Volume Variance = Recovered Overhead - Budgeted Overhead
= 48,750 - 45,000
= Rs. 3,750 (F)
- (iv) F.O. Efficiency Variance = Recovered Overhead - Standard Overhead
= 48,750 - 49,500
= Rs. 750 (A)
- (v) F.O. Capacity Variance = Standard Overhead - Revised budgeted Overhead
= 49,500 - 46,800
= Rs. 2,700 (F)
- (vi) Calendar Variance = Actual Days - Budget Days¹ × St. rate per day.
= (26 - 25) × 1,800
= Rs. 1,800 (F)

Variable Overhead Variances

- (i) V.O. Cost variance = Recovered Overhead - Actual Overhead
= 65,000 - 68,000 = Rs. 3,000 (A)
- (ii) V.O. Expenditure Variance = Standard Overhead - Actual Overhead
= 66,000 - 68,000 = Rs. 2,000 (A)
- (iii) V.O. Efficiency Variance = Recovered Overhead - Standard Overhead
= 65,000 - 66,000 = Rs. 1,000 (A)

Check

(i) F.O. Cost Variance = Expenditure variance + Volume Variance

$$1,250 (A) = 5,000 (A) + 3,750 (F)$$

(ii) F.O Volume Variance = Efficiency Variance + Capacity Variance + Calendar Variance

$$3,750 (F) = 750 (A) + 2,700 (F) + 1,800 (F)$$

(iii) V.O. Cost Variance = Expenditure Variance + Efficiency Variance

$$3,000 (A) = 2,000 (A) + 1,000 (A).$$

QUESTION 54

SP Limited produces a product 'Tempex' which is sold in a 10 Kg. packet. The standard cost card per packet of 'Tempex' are as follows:

	(Rs.)
Direct materials 10 kg @ Rs. 45 per kg	450
Direct labour 8 hours @ Rs. 50 per hour	400
Variable Overhead 8 hours @ Rs. 10 per hour	80
Fixed Overhead	<u>200</u>
	<u>1,130</u>

Budgeted output for the third quarter of a year was 10,000 Kg. Actual output is 9,000 Kg. Actual cost for this quarter are as follows:

	(Rs.)
Direct Materials 8,900 Kg @Rs. 46 per Kg.	4,09,400
Direct Labour 7,000 hours @Rs. 52 per hour	3,64,000
Variable Overhead incurred	72,500
Fixed Overhead incurred	1,92,000

You are required to calculate:

- (i) Material Usage Variance
- (ii) Material Price Variance
- (iii) Material Cost Variance
- (iv) Labour Efficiency Variance
- (v) Labour Rate Variance
- (vi) Labour Cost Variance
- (vii) Variable Overhead Cost Variance
- (viii) Fixed Overhead Cost Variance.

SOLUTION

(i) Material Usage Variance = Std. Price (Std. Quantity - Actual Quantity)
 = Rs. 45 (9,000 kg. - 8,900 kg.)
 = Rs. 4,500 (Favourable)

(ii) Material Price Variance = Actual Quantity (Std. Price - Actual Price)
 = 8,900 kg. (Rs. 45 - Rs. 46) = Rs. 8,900 (Adverse)

(iii) Material Cost Variance = Std. Material Cost - Actual Material Cost
 = (SQ × SP) - (AQ × AP)
 = (9,000 kg. × Rs. 45) - (8,900 kg. × Rs. 46)
 = Rs. 4,05,000 - Rs. 4,09,400
 = Rs. 4,400 (Adverse)

- (iv) Labour Efficiency Variance = Std. Rate (Std. Hours - Actual Hours)
 = Rs 50 $\frac{9,000 \times 8 \text{ hours} - 7,000 \text{ hrs.}}{10}$
 = Rs. 50 (7,200 hrs. - 7,000 hrs.)
 = Rs. 10,000 (Favourable)
- (v) Labour Rate Variance = Actual Hours (Std. Rate - Actual Rate)
 = 7,000 hrs. (Rs. 50 - Rs.52)
 = Rs. 14,000 (Adverse)
- (vi) Labour Cost Variance = Std. Labour Cost - Actual Labour Cost
 = (SH × SR) - (AH × AR)
 = (7,200 hrs. × Rs. 50) - (7,000 hrs. × Rs. 52)
 = Rs. 3,60,000 - Rs. 3,64,000
 = Rs.4,000 (Adverse)
- (vii) Variable Cost Variance = Std. Variable Cost - Actual Variable Cost
 = (7,200 hrs. × Rs. 10) - Rs. 72,500
 = Rs. 500 (Adverse)
- (viii) Fixed Overhead Cost Variance = Absorbed Fixed Overhead-Actual Fixed Overhead
 = $\frac{\text{Rs } 200 \times 9000 \text{ kgs.}}{10 \text{ kgs.}} - \text{Rs.1,92,000}$
 = Rs. 1,80,000 - Rs. 1,92,000 = Rs. 12,000 (Adverse)