CA INTERMEDIATE

COST
&
MANAGEMENT ACCOUNTING

Volume 2

By
CA Namit Arora Sir

This book is dedicated to my Niece

CANDY

PREFACE TO THIS EDITION

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

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

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

A word to the students

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

"Work hard in class, be attentive, grab the concepts
&
Work smart during revision, select important questions for next revision."

ALL THE BEST
CA. NAMIT ARORA

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CHAPTER 9 PROCESS & OPERATION COSTING

NORMAL PROCESS ACCOUNT

BQ 1

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

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

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

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

Selling and distribution expenses are ₹850 and sale value per unit is ₹6.00.

Prepare all accounts.

Answer

Process A Account

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

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

Process B Account

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

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

Process C Account

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

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

Normal Loss Account

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

Abnormal Loss Account

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

Abnormal Gain Account

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

Costing Profit and Loss Account

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

BQ 2

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

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

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

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

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

Answer

Process I Account

Particulars	Units	₹	Particulars	Units	₹
To Materials	10,000	40,000	By Normal Loss	200	-
To Labour		6,000	(2% of 10,000 units)		
To Manufacturing OH		10,000	By Abnormal Loss A/c	50	286
			By Process II Account	9,750	55,714
			@ ₹5.7142 per unit		
	10,000	**56,000**		**10,000**	**56,000**

Cost per unit of completed units and abnormal loss:

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

Process II Account

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

Cost per unit of completed units and abnormal gain:

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

Process III Account

Particulars	Units	₹	Particulars	Units	₹
To Process II A/c	9,400	91,051	By Normal Loss	940	-
To Materials		10,000	(10% of 9,400 units)		
To Labour		1,000	By Abnormal Loss A/c	460	6,364
To Manufacturing OH		15,000	By Finished Goods A/c	8,000	1,10,687
			@ ₹13.8358 per unit		
	9,400	**1,17,051**		**9,400**	**1,17,051**

Cost per unit of completed units and abnormal loss:

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

BQ 3

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

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

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

Answer

Process I Account

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

Process II Account

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

Process III Account

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

Working Notes:

Calculation of apportionment of Indirect Expenses:

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

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

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

BQ 4

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

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

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

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

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

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

BQ 5

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

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

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

Answer

Process-I Account

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

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

Process-II Account

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

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

Finished Goods Stock Account

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

Income Statement

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

PROCESS ACCOUNT WITH ROYALTY

BQ 6

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

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

Prepare:

(a) Purifying Process Account
(b) Normal Wastage Account
(c) Abnormal Wastage/Yield Account
(d) Royalty Payable Account

Answer

(a) Purifying Process Account

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

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

(b) Normal Wastage Account

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

(c) Abnormal Yield Account

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

(d) Royalty Payable Account

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

PROCESS ACCOUNT WITH BY PRODUCTS

BQ 7

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

Details	Process I	Process II	Process III
Normal loss	5%	10%	5%
Materials introduced (7,000 units)	1,40,000	-	-
Other materials added	62,000	1,36,000	84,200
Direct wages	42,000	54,000	48,000
Direct Expenses	14,000	16,000	14,000

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

No. of units produced:

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

You are required to prepare accounts for:

(1) Process I, II and III
(2) By product process.

Answer

(1) Process I Account

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

Production OH Rate = (Production OH ÷ Direct wages) × 100

= [2,88,000 ÷ (42,000 + 54,000 + 48,000)] × 100 = **200%**

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

Process II Account

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

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

Process III Account

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

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

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

(2) By-Product Process Account

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

STATEMENT OF PROFIT

BQ 8

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

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

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

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

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

Prepare the three process accounts and a statement of income.

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

INPUT – OUTPUT RATIO

BQ 9

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

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

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

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

Answer

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

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

(2) Calculation of cost of raw material:

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

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

Working Note:

Statement of production

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

EQUIVALENT PRODUCTION (CLOSING WIP ONLY)

BQ 10

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

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

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

Calculate:

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

Answer

(A) Statement of Equivalent Production

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

(B) Statement of Cost per Equivalent Unit

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

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

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

BQ 11

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

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

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

Following are the further details regarding Process X:

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

Note: The scrapped units fetched ₹10 each

Required:

(A) Statement of Equivalent Production;
(B) Statement of Cost;
(C) Statement of Evaluation;
(D) Process X Account.

Answer

(A) Statement of Equivalent Production

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

(B) Statement of Cost

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

(C) Statement of Evaluation

Particulars	Elements	Equivalent Units	Cost Per Unit	Total (₹)
Abnormal Loss	Materials	40	40	1,600
	Labour	40	20	800
	Overhead	40	10	400
				2,800
Transfer to Process Y	Materials	1,400	40	56,000

	Labour	1,400	20	28,000
	Overhead	1,400	10	14,000
				98,000
Closing WIP	Materials	345	40	13,800
	Labour	230	20	4,600
	Overhead	230	10	2,300
				20,700

(D) Process X Account

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

BQ 12

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

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

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

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

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

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

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

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

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

Answer

Process Account

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

Abnormal Loss A/c

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

Working Notes:

Statement of Equivalent Production (Process I)

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

Statement of Cost

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

Statement of Evaluation

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

BQ 13

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

The Process I costs incurred were as follows:

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

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

Costs incurred in Process II are as follows:

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

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

Required:

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

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

Answer

Statement of Equivalent Production (Process I)

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

Statement of Cost (Process I)

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

Statement of Apportionment of Cost (Process I)

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

Process I Account

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

Statement of Equivalent Production (Process II)

Particulars	Units	Materials		Labour & Overhead	
		%	Eq. Unit	%	Eq. Unit
Normal Loss	200	-	-	-	-

Units Completed	28,000	100	28,000	100	28,000
Closing WIP	1,800	100	1,800	25	450
Total	***30,000***	***-***	***29,800***	***-***	***28,450***

Statement of Cost (Process II)

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

Statement of Apportionment of Cost (Process II)

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

Process II Account

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

EQUIVALENT PRODUCTION (OPENING AND CLOSING WIP)

BQ 14

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

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

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

Costs pertaining to the month of May are as follows:

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

Calculate:

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

Answer

(a) Statement of Equivalent Production

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

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

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

BQ 15

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

1. Opening stock of work in process 800 units at a total cost of ₹4,000.
2. Degree of completion of opening work in progress:
   - Materials 100%
   - Labour 60%
   - Overheads 60%
3. Input of materials at a total cost of ₹36,800 for 9,200 units.
4. Direct wages incurred ₹16,740
5. Production overhead ₹8,370
6. Unit scrapped 1,200 units. The state of completion of these units was:
   - Materials 100%
   - Labour 80%
   - Overheads 80%
7. Closing work in progress 900 units. The stage of completion of these units was:
   - Materials 100%
   - Labour 70%
   - Overheads 70%
8. 7,900 units were completed and transferred to the next process.
9. Normal loss is 8% of the total input.
10. Scrap value is ₹4 per unit.

You are required to:

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

Answer

(A) Statement of Equivalent Production

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

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

(B) Statement of Cost

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

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

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

(D) Process Account For March 2023

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

BQ 16

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

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

You are required to:

(a) Compute equivalent units of production using ***FIFO Method.***
(b) Compute cost per equivalent units for each cost element i.e. material labour and overheads.
(c) Compute the cost of finished output, closing work in progress and abnormal gain.
(d) Prepare the process and other accounts.

Answer

(a) Statement of Equivalent Production

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

(b) Statement of Cost

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

(c) Statement of Evaluation

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

(d) Process Account

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

BQ 17

Opening Work-in-progress	2,000 units
Materials (100% complete)	₹7,500
Labour (60% complete)	₹3,000

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

From the following details prepare:

(a) Statement of Equivalent Production,
(b) Statement of Cost and
(c) Statement of Apportionment of Cost as per ***Weighted Average Cost*** basis.

Answer

(a) Statement of Equivalent Production

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

(b) Statement of Cost

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

(c) Statement of Apportionment of Cost

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

BQ 18

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

Production Records:

Units in process as on 1st Feb	4,000
(All materials used, 25% complete for labour and overhead)	
New units introduced	16,000
Units completed	14,000
Units in process as on 28th Feb	6,000
(All materials used, 33-⅓% complete for labour and overhead)	

Cost Records:

Work-in-process as on 1st Feb

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

Cost during the month

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

Presuming that average method of inventory is used, prepare:

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

Answer

Statement of Equivalent Production

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

Statement of Cost

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

Statement of Apportionment of Cost

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

Process Account

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

BQ 19

Following details are related to the work done in Process 'A' of XYZ Company during the month of March, 2024:

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

You are required to prepare

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

Answer

1. Statement of Equivalent Production (Average Cost Method)

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

2. Statement of Cost

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

3. Statement of Evaluation

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

4. Process A Account

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

Normal Loss Account

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

Abnormal Loss Account

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

BQ 20

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

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

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

Opening work-in process (4,500 litre)	
Sugarcane	₹50,000
Labour	₹15,000
Overheads	₹45,000
Sugarcane introduced for juice extraction (1,00,000 kg)	₹5,00,000
Direct Labour	₹2,00,000
Overheads	₹6,00,000
Abnormal Loss	1,000 kg
Degree of completion:	

Sugarcane	100%
Labour and overheads	80%
Closing work-in process	9,000 litre
Degree of completion:	
Sugarcane	100%
Labour and overheads	80%
Extracted juice transferred for filtering and boiling (Consider mass of 1 litre of juice equivalent to 1 kg)	39,500 litre

You are required to prepare using average method:

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

Answer

1. Statement of Equivalent Production (Average Cost Method)

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

2. Statement of Cost

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

3. Statement of Distribution of Cost

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

4. Process I Account

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

BQ 21

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

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

Answer

(1) FIFO Method:

(a) Statement of Equivalent Production

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

(b) Statement of Cost

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

(c) Statement of Evaluation

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

(2) Weighted Average Method:

(a) Statement of Equivalent Production

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

(b) Statement of Cost

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

(c) Statement of Evaluation

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

INTER PROCESS PROFIT

BQ 22

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

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

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

Answer

Process I A/c

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

Process II A/c

Particulars	Total	Cost	Profit	Particulars	Total	Cost	Profit
Opening Stock	9,000	7,500	1,500	Finished Stock A/c	1,12,500	75,750	36,750
Process II A/C	54,000	40,500	13,500				

Direct Materials	15,750	15,750	-	Closing Stock	4,500	3,750	*750
Direct Wages	11,250	11,250	-				
Prime Cost	90,000	75,000	15,000				
Factory OH	4,500	4,500	-				
Total Cost	94,500	79,500	15,000				
Profit	22,500	-	22,500				
	1,17,000	***79,500***	***37,500***		***1,17,000***	***79,500***	***37,500***

Finished Stock A/c

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

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

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

PAST YEAR QUESTIONS

PYQ 1

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

	Process A	Process B
40,000 units introduced at a cost of	₹3,60,000	-
Materials Consumed	₹2,42,000	₹2,25,000
Direct Wages	₹2,58,000	₹1,90,000
Manufacturing Expenses	₹1,96,000	₹1,23,720
Output in Units	37,000	27,000
Normal Wastage of Input	5%	10%
Scrap Value (per unit)	₹15	₹20
Selling Price (per unit)	₹37	₹61

Additional Information:

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

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

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

Required:

(i) Prepare Process A and Process B Account.

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

[(8 Marks) May 2014]

Answer

(i) Process A Account

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

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

Process B Account

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

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

(ii) Profit and Loss Account

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

PYQ 2

The following information relate to process A:

(1) Opening work-in process — 8,000 units at ₹75,000

Degree of completion:

Materials	100%
Labour and Overhead	60%

(2) Input 1,82,000 units at ₹7,37,500

(3) Labour paid ₹3,40,600

(4) Overheads incurred ₹1,70,300

(5) Units scrapped 14,000

Degree of completion:

Material	100%
Labour and overhead	80%

(6) Closing work-in-process 18,000 units

Degree of completion:

Material	100%
Labour and overhead	70%

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

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

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

You are required to compute on the basis FIFO method:

(a) Equivalent production,

(b) Cost per unit.

(c) Value of Units transferred to next process.

[(8 Marks) Nov 2014]

Answer

(a) Statement of Equivalent Production

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

(b) Statement of Cost Per Unit

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

(c) Statement Showing Value Units Transferred to Next Process

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

PYQ 3

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

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

You are required to

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

[(8 Marks) Nov 2015]

Answer

(a) Statement of Equivalent Production

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

(b) Statement of Cost Per Unit

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

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

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

PYQ 4

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

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

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

You are required to prepare:

(i) All process accounts and
(ii) Finished Stock A/c showing profit element at each stage.

[(8 Marks) May 2017]

Answer

(i) Process XM A/c

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

Process YM A/c

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

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

Process ZM A/c

Particulars	Cost	Profit	Total	Particular	Cost	Profit	Total
Opening Stock	60,000	20,000	80,000	Finished Stock A/c	14,91,258	11,00,742	25,92,000
Process ZM	10,72,758	4,52,242	15,25,000				
Materials	1,00,000	-	1,00,000	Closing Stock	58,500	19,500	78,000
Wages	1,84,000	-	1,84,000				
Prime Cost	14,16,758	4,72,242	18,89,000				
Factory OH	1,33,000	-	1,33,000				
Total Cost	15,49,758	4,72,242	20,22,000				
Profit	-	6,48,000	6,48,000				
	15,49,758	***11,20,242***	***26,70,000***		***15,49,758***	***11,20,242***	***26,70,000***

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

(ii) Finished Stock A/c

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

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

PYQ 5

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

Opening work-in process	5,000 units
Materials	₹35,000
Labour	₹13,000
Overheads	₹25,000
Units introduced into process X	55,000 units
Materials	₹20,20,000
Labour	₹8,00,000
Overheads	₹13,30,000

Units scrapped	5,000 units
Degree of completion:	
Material	100%
Labour and overhead	60%
Closing work-in-process	5,000 units
Degree of completion:	
Material	100%
Labour and overhead	60%
Units finished and transferred to Process Y	50,000 units

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

Presuming average method of inventory is used, prepare:

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

[(8 Marks) May 2018]

Answer

(1) Statement of Equivalent Production

Particulars	Input	Particulars	Output	Materials		Conversion Cost	
				%	Unit	%	Unit
Opening WIP	5,000	Transfer to Process Y	50,000	100	50,000	100	50,000
Fresh Units	55,000	Normal Loss (5% of 60,000)	3,000	-	-	-	-
		Abnormal Loss	2,000	100	2,000	60	1,200
		Closing WIP	5,000	100	5,000	60	3,000
Total	***60,000***	***Total***	***60,000***	***-***	***57,000***	***-***	***54,200***

(2) Statement of Cost

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

(3) Statement of Distribution of Cost

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

(4) Abnormal Loss A/c

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

PYQ 6

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

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

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

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

Prepare Process P, Q and R accounts. Also calculate selling price per unit of end product.
[(10 Marks) May 2018]

Answer

1. Process P Account

Particulars	Units	₹	Particulars	Units	₹
To Input	10,000	50,000	By Normal Loss	1,000	1,000
To Direct Materials		38,000	(10% of 10,000 units)		
To Direct Labour		30,000	By Process Q Account @	9,000	1,39,500
To Manufacturing OH (75% of 30,000)		22,500	₹15.50 per unit		
	10,000	**1,40,500**		**10,000**	**1,40,500**

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

$$= {}^{1,40,500 - 1,000}/_{10,000 - 1,000} = \textbf{₹15.50}$$

2. Process Q Account

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

$$\text{Cost per unit of completed units} = {}^{2,52,000 - 900}/_{9,000 - 900} = \textbf{₹31.00}$$

3. Process R Account

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

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

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

Working note:

Calculation of recovery rate of overheads:

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

= **75% of labour cost**

PYQ 7

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

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

Using FIFO method, compute:

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

[(5 Marks) Nov 2018]

Answer

(1) Statement of Equivalent Production

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

(2) Statement of Cost Per Equivalent Unit

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

PYQ 8

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

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

Raw materials	₹35
Labour	₹8
Overheads	₹10
Total	₹53

You are required to:

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

[(8 Marks) Nov 2018]

Answer

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

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

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

Normal loss = 10% of Input = 10% of 7,220 = **722 litres**
Abnormal loss = Actual loss – Normal loss
= 2,200 – 722 = **1,478 litres**

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

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

(4) Process A/c

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

Working Note:

(a) Statement of Equivalent Production

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

(b) Statement of Evaluation

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

PYQ 9

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

Particulars	Process		Finished Stock
	A (₹)	B (₹)	(₹)
Opening Stock	5,000	5,500	10,000
Direct Materials	9,000	9,500	
Direct Wages	5,000	6,000	
Factory Overheads	4,600	2,030	
Closing Stock	2,000	2,490	5,000
Inter-process profit included in opening stock	-	1,000	4,000

Output of Process A is transferred to Process B at 25% profit on the transfer price and output of Process B is transferred to finished stock at 20% profit on the transfer price. Stock in process is valued at

prime cost. Finished stock is valued at the price at which it is received from Process B. Sales during the period are ₹75,000.

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

[(10 Marks) May 2019]

Answer

Process A A/c

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

Process B A/c

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

Finished Stock A/c

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

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

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

PYQ 10

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

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

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

Prepare:

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

[(10 Marks) Nov 2019]

Answer

(1) Process 1 Account

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

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

Process 2 Account

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

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

(2) Finished Goods Account

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

(3) Normal Loss Account

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

(4) Abnormal Loss Account

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

(5) Abnormal Gain Account

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

PYQ 11

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

Opening work-in-progress	3,000 units
Materials	₹1,80,500
Labour	₹32,400
Overheads	₹90,000
Materials introduced in Process I	42,000 units
Materials	₹36,04,000
Direct labour	₹4,50,000
Overheads	₹15,18,000
Units scrapped	4,800 units

Degree of completion:

Materials	100%
Labour and overheads	70%
Closing work-in-progress	4,200 units

Degree of completion:

Materials	100%
Labour and overhead	50%
Units finished and transferred to Process II	36,000 units

Normal loss:

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

Prepare:

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

[(10 Marks) Nov 2020]

Answer

1. Statement of Equivalent Production (Average Cost Method)

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

2. Statement of Cost per Equivalent Unit

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

3. Process I Account

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

4. Normal Loss Account

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

5. Abnormal Loss Account

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

Working note: **Statement of Evaluation**

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

PYQ 12

MNO Ltd has provided following details:

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

You are required to prepare using FIFO method:

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

[(5 Marks) Jan 2021]

Answer

(1) Statement of Equivalent Production (FIFO Method)

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

(2) Abnormal Loss Account

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

Working notes:

(a) Statement of Cost per Equivalent Unit

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

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

PYQ 13

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

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

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

The following additional information if given:

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

You are required to:

(1) Find out the percentage of wastage in process 'Y' given that the output of process 'Y' is transferred to process 'Z' at ₹4 per unit.
(2) Prepare process accounts for all the three processes X, Y and Z.

[(10 Marks) July 2021]

Answer

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

Let scrap units in process Y be 'x'

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

$$4\,(14{,}100 - x) = 52{,}610 - 2x$$
$$56{,}400 - 4x = 52{,}610 - 2x$$
$$3{,}790 = 2x$$
$$x = 3{,}790 \div 2 = 1{,}895 \text{ units}$$

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

(2) Process X Account

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

Process Y Account

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

Process Z Account

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

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

PYQ 14

A product passes through Process-I and Process-II. Particulars pertaining to the Process I are: Materials issued to Process I amounted to ₹80,000, Wages ₹60,000 and manufacturing overheads were ₹52,500. Normal Loss anticipated was 5% of input. 9,650 units of output were produced and transferred out from Process I to Process II. Input raw materials issued to Process I were 10,000 units. There were no opening stocks. Scrap has realizable value of ₹5 per unit.

You are required to prepare:

1. Process I Account
2. Abnormal Gain Account

[(5 Marks) Dec 2021]

Answer

1. Process I Account

Particulars	Units	₹	Particulars	Units	₹
To Raw Material Issued	10,000	80,000	By Normal Loss A/c	500	2,500
To Wages		60,000	(5% @ ₹5 per unit)		
To Manufacturing OH		52,500	By Process II A/c	9,650	1,93,000
To Abnormal Gain A/c @ ₹20 per unit	150	3,000	@ ₹20 per unit		
	10,150	**1,95,500**		**10,150**	**1,95,500**

NCPU = $\frac{\text{Total Cost – Sale value of Normal Loss Units}}{\text{Total Units–Normal Loss Units}}$ = $\frac{1,92,500 - 2,500}{10,000 - 500}$ = **₹20 per unit**

2. Abnormal Gain Account

Particulars	Units	₹	Particulars	Units	₹
To Normal Loss A/c	150	750	By Process I A/c	150	3,000
To Costing P/L A/c		2,250			
	150	**3,000**		**150**	**3,000**

PYQ 15

STG Limited is a manufacturer of Chemical 'GK', which is required for industrial use. The complete production operation requires two processes. The raw material first passes through Process I, where Chemical 'G' is produced. Following data is furnished for the month April 2022:

Particulars	(in kgs.)
Opening work-in-progress quantity (Material 100% and conversion 50% complete)	9,500

Material input quantity	1,05,000
Work Completed quantity	83,000
Closing work-in-progress quantity (Material 100% and conversion 60% complete)	16,500

You are further provided that:

Particulars	*(in ₹)*
Opening work-in-progress cost:	
Material cost	29,500
Processing cost	14,750
Material input cost	3,34,500
Processing cost	2,53,100

Normal process loss may be estimated to be 10% of material input. It has no realizable value. Any loss over and above normal loss is considered to be 100% complete in material and processing.

The Company transfers 60,000 kgs. of output (Chemical G) from Process I to Process II for producing Chemical 'GK'. Further materials are added in Process II which yield 1.20 kg. of Chemical 'GK' for every kg. of Chemical 'G' introduced. The chemicals transferred to Process II for further processing are then sold as Chemical 'GK' for ₹10 per kg. Any quantity of output completed in Process I, are sold as Chemical 'G' @ ₹9 per kg.

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

Input 60,000 kg. of Chemical 'G':
Materials Cost ₹85,000
Processing Costs ₹50,000

You are required:

(a) Prepare Statement of Equivalent production and determine the cost per kg. of Chemical 'G' in Process I using the weighted average cost method.

(b) Prepare a statement showing cost of Chemical 'G' transferred to Process II, cost of abnormal loss and cost of closing work-in progress.

(c) STG is considering the option to sell 60,000 kg. of Chemical 'G' of Process I without processing it further in Process-II. Will it be beneficial for the company over the current pattern of processing 60,000 kg in process-II?

[(10 Marks) May 2022]

Answer

(a) Statement of Equivalent Production (Average Cost Method)

Particulars	*Units*	*Materials*		*Processing Cost*	
		%	*Unit*	*%*	*Unit*
Units Completed	83,000	100	83,000	100	83,000
Normal loss (10% of 10,500)	10,500	-	-	-	-
Closing WIP	16,500	100	16,500	60	9,900
Abnormal Loss (9,500 + 1,05,000 -83,000 – 16,500 – 10,500)	4,500	100	4,500	100	4,500
Total	*1,14,500*	*-*	*1,04,000*	*-*	*97,400*

Statement of Cost per Equivalent Unit

Elements	*Total Cost*	*Equivalent Units*	*Cost Per Unit*
Materials	29,500 + 3,34,500 = 3,64,000	1,04,000	3.50

Processing Cost	14,750 + 2,53,100 = 2,67,850	97,400	2.75
			6.25

(b) Statement Showing Cost of Chemical 'G' transferred to Process II, Cost of Abnormal Loss and Cost of Closing work-in progress

Particulars	Elements	Eq. Units	Cost Per Unit	Total
Units transferred (60,000 units)	All	60,000	6.25	**3,75,000**
Abnormal Loss	All	4,500	6.25	**28,125**
Closing WIP	Materials	16,500	3.50	57,750
	Processing Cost	9,900	2.75	27,225
				84,975

(c) Further Processing Decision:

Incremental revenue	Incremental cost	Situation	Decision
(60,000 × 1.2 kgs × ₹10) – (60,000 × ₹9) = ₹1,80,000	₹85,000 + ₹50,000 = ₹1,35,000	IR > IC	Yes

Advise: Additional net profit on further processing in Process II is 45,000 (1,80,000 – 1,35,000). Therefore, it is advisable to process further chemical 'G'.

PYQ 16

N Ltd. produces a product which passes through two processes – Process-I and Process-II. The company has provided following information related to the Financial Year 2021-22.

Particulars	Process-I	Process-II
Raw Material @ ₹65 per unit	6,500 units	-
Direct Wages	₹1,40,000	₹1,30,000
Direct Expenses	30% of Direct wages	35% of Direct wages
Manufacturing Overheads	₹21,500	₹24,500
Realisable value of scrap per unit	₹4.00	₹16.00
Normal Loss	250 units	500 units
Units transferred to Process II / finished stock	6,000 units	5,500 units
Sales	-	5,000 units

There was no opening or closing stock of work-in-progress.

You are required to prepare:

(a) Process-I Account
(b) Process-II Account
(c) Finished Stock Account

[(10 Marks) Nov 2022]

Answer

(a) Process-I Account

Particulars	Units	₹	Particulars	Units	₹
To Raw Materials used	6,500	4,22,500	By Normal Loss	250	1,000
To Direct Wages		1,40,000	By Process-II Account @	6,000	6,00,000
To Direct Expenses		42,000	₹100 per unit		
(30% of ₹1,40,000)			By Abnormal Loss A/c @	250	25,000
To Manufacturing OH		21,500	₹100 per unit		
	6,500	**6,26,000**		**6,500**	**6,26,000**

$$NCPU = \frac{\text{Total Cost} - \text{Realisable Value of Normal Loss Units}}{\text{Inputs Units} - \text{Normal Loss Units}} = \frac{6,26,000 - 1,000}{6,500 - 250} = ₹100 \text{ p.u.}$$

(b) Process-II Account

Particulars	Units	₹	Particulars	Units	₹
To Process-I A/c	6,000	6,00,000	By Normal Loss	500	8,000
To Direct Wages		1,30,000	By Finished Stock A/c @	5,500	7,92,000
To Direct Expenses (35% of ₹1,30,000)		45,500	₹144 per unit		
To Manufacturing OH		24,500			
	6,000	**8,00,000**		**6,000**	**8,00,000**

$$NCPU = \frac{\text{Total Cost} - \text{Realisable Value of Normal Loss Units}}{\text{Inputs Units} - \text{Normal Loss Units}} = \frac{8,00,000 - 8,000}{6,000 - 500} = ₹144 \text{ p.u.}$$

(c) Finished Stock Account

Particulars	Units	₹	Particulars	Units	₹
To Process-II A/c	5,500	7,92,000	By COS @ ₹144 per unit	5,000	7,20,000
			By Balance c/d	500	72,000
	5,500	**7,92,000**		**5,500**	**7,92,000**

SUGGESTED REVISION FOR EXAM:

BQ: 1, 4, 5, 7, 8, 11, 12, 13, 15, 17, 20, 22

PYQ: 4, 8

CHAPTER 10 JOINT PRODUCTS & BY PRODUCTS

METHODS OF APPORTIONMENT OF JOINT COST

BQ 1

A coke manufacturing company produces the following products by using 5,000 tonnes of coal @ ₹1,100 per ton into a common process.

Coke	3,500 tonnes
Tar	1,200 tonnes
Sulphate of ammonia	52 tonnes
Benzol	48 tonnes

Apportion the joint cost amongst the products on the basis of the physical unit method.

Answer

Statement Showing Apportionment of Joint Cost

Particulars	*Coke*	*Tar*	*Ammonia*	*Benzol*
Number of units (Quantity in Tonnes)	3,500	1,200	52	48
Apportionment of Joint Cost (₹55,00,000 in proportion of units)	***₹40,10,417***	***₹13,75,000***	***₹59,583***	***₹55,000***

BQ 2

Find out cost of joint products A, B and C using average unit cost method from the following data:

Pre-separation Joint Cost ₹60,000

Production data:

Products	*Unit Produced*
A	500
B	200
C	300
	1,000

Answer

$$\textit{Average unit cost} = \frac{\text{Total Joint Cost}}{\text{Total Units}} = \frac{60,000}{1,000} = \textit{₹60 per unit}$$

Joint Cost:

Product A	=	500 Units × ₹60	=	***₹30,000***
Product B	=	200 Units × ₹60	=	***₹12,000***
Product C	=	300 Units × ₹60	=	***₹18,000***

BQ 3

An entity incurs a joint cost of ₹64,500 in producing two products A (200 units), B (200 units) and earns a sales revenue of ₹86,000 by selling @ ₹170 per unit of product A and product B @ ₹260 per unit.

Apportion the joint cost on the basis of Market value at the point of separation.

Answer

Statement Showing Apportionment of Joint Cost

Particulars	*Product A*	*Product B*
Number of units	200	200
Market value at separation point per unit	₹170	₹260
Total market value at separation point	₹34,000	₹52,000
Apportionment of Joint Cost ₹64,500 in 34 : 52	***₹25,500***	***₹39,000***

BQ 4

An entity incurs a joint cost of ₹64,500 in producing two products A (200 units), B (200 units) and sale price of the products A and B after further processing are ₹200 and ₹300 respectively.

Apportion the joint cost on the basis of Market value after further processing.

Answer

Statement Showing Apportionment of Joint Cost

Particulars	*Product A*	*Product B*
Number of units	200	200
Market value after further processing per unit	₹200	₹300
Total market value after further processing	₹40,000	₹60,000
Apportionment of Joint Cost ₹64,500 in 40 : 60	***₹25,800***	***₹38,700***

BQ 5

An entity incurs a joint cost of ₹64,500 in producing two products A (200 units), B (200 units) and earns a sales revenue of ₹86,000 by selling @ ₹170 per unit of product A and product B @ ₹260 per unit. Further processing costs for products A and B are ₹4,000 and ₹32,000 respectively.

Apportion the joint cost on the basis of Net Realisable Value at Split-off Point Method.

Answer

Statement Showing Apportionment of Joint Cost

Particulars	*Product A*	*Product B*
Number of units	200	200
Market value after further processing	₹34,000	₹52,000
Less: Further processing cost	₹4,000	₹32,000
Net Realisable Value (NRV)	***₹30,000***	***₹20,000***
Apportionment of Joint Cost ₹64,500 in 30 : 20	***₹38,700***	***₹25,800***

BQ 6

Find out the cost of joint products A and B using contribution margin method from the following data:

Sales:

Product A	100 kg @ ₹60 per kg.
Product B	120 kg @ ₹30 per kg.

Joint costs

Marginal cost ₹ 4,400
Fixed cost ₹ 3,900

Answer

Statement Showing Apportionment of Joint Cost

Particulars	Product A	Product B
Number of units (Quantity in Kgs.)	100	120
Variable Joint Cost ₹4,400 in 100 : 120	**₹2,000**	**₹2,400**
Sales	₹6,000	₹3,600
Less: Variable joint cost	₹2,000	₹2,400
Contribution	**₹4,000**	**₹1,200**
Fixed Joint Cost ₹3,900 in 40 : 12	**₹3,000**	**₹900**
Total Joint Cost	**₹5,000**	**₹3,300**

BQ 7

From the following details apportion ₹37,500 joint cost.

Particulars	Product A	Product B
Sale value after further processing	50,000	80,000
Profit	10%	20%
Selling expenses	5%	5%
Further cost	25,000	40,000

Answer

Statement Showing Apportionment of Joint Cost

Particulars	Product A	Product B
Sale value after further processing	50,000	80,000
Less: Profit	(5,000)	(16,000)
Less: Selling expenses	(2,500)	(4,000)
Less: Further cost	(25,000)	(40,000)
Joint Cost	**₹17,500**	**₹20,000**

BQ 8

From the following details apportion ₹39,000 joint cost using gross constant margin method.

Particulars	Product A	Product B
Sale value after further processing	60,000	70,000
Selling expenses	5%	5%
Further cost	20,000	45,000

Answer

Statement Showing Apportionment of Joint Cost

Particulars	Product A	Product B
Sale value after further processing	60,000	70,000
Less: Profit @ 15%	(9,000)	(10,500)
Less: Selling expenses	(3,000)	(3,500)
Less: Further cost	(20,000)	(45,000)
Joint Cost	**₹28,000**	**₹11,000**

Calculation of Constant % of Profit/Margin:

Particulars		Total
Total sale value	(60,000 + 70,000)	1,30,000
Less: Total selling expenses	(3,000 + 3,500)	(6,500)
Less: Total further cost	(20,000 + 45,000)	(65,000)
Less: Total joint cost		(39,000)

Total Profit	***₹19,500***
% of Profit [(19,500 ÷ 1,30,000) × 100]	***15%***

BQ 9

Bright Chemicals Ltd. electrolyses common salt to obtain three joint products - caustic soda, chlorine and hydrogen. During a costing period, the expenditure relating to the inputs for the common process amounted to ₹3,50,000. After separation expenses amounting to ₹1,60,000, ₹75,000 and ₹10,000 were incurred for caustic soda, chlorine and hydrogen respectively.

The entire production was sold and ₹3,75,000, ₹2,50,000 and ₹60,000 were realised for caustic soda, chlorine and hydrogen respectively. The selling expenses were estimated at 5% of realizations sale. The management expected profits @ 15%, 10% and 5% of realization from sale of caustic soda, chlorine, and hydrogen respectively.

Draw a columnar statement showing the apportionment of joint costs and the profitability of each product.

Answer

Statement Showing Apportionment of Joint Cost

Particulars	***Soda***	***Chlorine***	***Hydrogen***
Sale value after further processing	3,75,000	2,50,000	60,000
Less: Estimated profit @ 15%, 10% and 5% on sales	56,250	25,000	3,000
Less: Selling expenses @ 5% of sales	18,750	12,500	3,000
Less: Further cost	1,60,000	75,000	10,000
Estimated Joint Cost	***₹1,40,000***	***₹1,37,500***	***₹44,000***
Joint Cost ₹3,50,000 in 1,400 : 1,375 : 440	***₹1,52,411***	***₹1,49,689***	***₹47,900***
Profit (Sales–Selling expenses–Further cost–Actual Joint cost)	***₹43,839***	***₹12,811***	***(₹900)***

FURTHER PROCESSING DECISION

BQ 10

From the following details advise whether products should be processed further or not:

Particulars		***Product A***	***Product B***	***Product C***
Sale value:	After further processing	1,50,000	2,40,000	70,000
	At separation point	80,000	1,50,000	50,000
Selling expenses:	After further processing	20,000	30,000	12,000
	At separation point	15,000	20,000	7,000
Further cost		30,000	80,000	35,000

Answer

Statement Showing Further Processing Decision

Product	***Calculation Incremental Revenue and Cost***		***Status***	***Decision***
A	IR = 1,50,000 – 80,000 IC = 30,000 + (20,000 – 15,000)	= 70,000 = 35,000	IR > IC	***Yes***
B	IR = 2,40,000 – 1,50,000 IC = 80,000 + (30,000 – 20,000)	= 90,000 = 90,000	IR = IC	***Indifferent***
C	IR = 70,000 – 50,000 IC = 35,000 + (12,000 – 7,000)	= 20,000 = 40,000	IR < IC	***No***

BQ 11

Sellwell Ltd. operates a chemical process which produces four products A, B, C and D from a basis raw material. The company's budget for a month is as under:

Raw materials consumption	:	₹17,520
Initial processing wages	:	₹16,240
Initial processing overheads	:	₹16,240
		₹50,000

Product	*Production (in kgs)*	*Sales (in ₹)*	*Separate costs (in ₹)*
A	16,000	1,09,600	28,800
B	200	5,600	Nil
C	2,000	30,000	16,000
D	360	21,600	6,600

The company presently intends to sell product B at the point of split off without further processing. The remaining products A, C and D are to be further processed and sold. However, the management has been advised that it would be possible to sell all the four products at the split off point without further processing and if this course was adopted. The selling prices would be as under:

Product	*A*	*B*	*C*	*D*
Selling Price Per Kg (in ₹)	4.00	28.00	8.00	40.00

The joint costs are to be apportioned on the basis of the ***sales value realisation at the point of split-off***.

You are required to:

(a) Prepare a statement showing the apportionment of joint costs.
(b) Prepare a statement showing the product wise and total budgeted profit or loss based on the proposal to sell product B at the split-off point and products A, C and D after further processing.
(c) Prepare a statement to show the product wise and total profit or loss if the alternative strategy to sell all the products at split off stage was adopted.
(d) Recommend any other alternative which, in your opinion, can increase the total profit. Further calculate the total profit as also the product wise profit or loss based on your recommendation.

[(a) 32,000; 2,800; 8,000; 7,200 (b) 48,800; 2,800; 6,000; 7,800; 65,400 (c) 32,000; 2,800; 8,000; 7,200; 50,000 (d) B & C should be sold at split off point and A and D after further processing; 48,800; 2,800; 8,000; 7,800; 67,400]

BQ 12

A company purchases raw materials worth ₹11.04 lakhs and processes them into four products P, Q, R and S, which have a unit sale value of ₹3, ₹9, ₹16 and ₹60 respectively at split-off point, as they could be sold as such to other processors. However, during a year, the company decided to further process and sell products P, Q and S, while R was not to be processed further but sold at split-off point to other processors. The processing of raw materials into the four products cost ₹28 lakhs to the company. The other data for the year were as under:

Product	*Output (in units)*	*Sales (in ₹)*	*Separate costs (in ₹)*
P	10,00,000	46,00,000	12,00,000
Q	20,000	4,00,000	2,40,000
R	10,000	1,60,000	NIL
S	18,000	12,00,000	40,000

You are required to work out the following information for managerial decision-making:

(a) If the joint costs are allocated amongst the four products on the basis of ***Net realizable value at split-off point***, what would be the company's annual income?

(b) If the company had sold off all the other three products at split-off stage, identify the increase or decrease in the company's annual income as compared to ***(a)*** above.

(c) What sales strategy could the company have planned to maximize its profits in the year?

(d) Identify the net increase in income if the strategy at ***(c)*** is adopted, as compared to ***(a)*** above.

Answer

(a) Statement Showing Annual Income (Net Realisable Value Method)

Products	*P (₹)*	*Q (₹)*	*R (₹)*	*S (₹)*	*Total (₹)*
Sales value after further processing	46,00,000	4,00,000	1,60,000	12,00,000	63,60,000
Less: Further cost	12,00,000	2,40,000	-	40,000	14,80,000
Net Realisable Value	34,00,000	1,60,000	1,60,000	11,60,000	48,80,000
Joint Cost (in NRV proportion)	***27,20,000***	***1,28,000***	***1,28,000***	***9,28,000***	***39,04,000***
Sales value after further processing	46,00,000	4,00,000	1,60,000	12,00,000	63,60,000
Less: Further cost	12,00,000	2,40,000	-	40,000	14,80,000
Less: Joint cost	27,20,000	1,28,000	1,28,000	9,28,000	39,04,000
Annual Income	***6,80,000***	***32,000***	***32,000***	***2,32,000***	***9,76,000***

Joint cost = Raw material cost + Processing cost (excluding material cost)
= 11,04,000 + 28,00,000 = ***39,04,000***

(b) Statement Showing Annual Income (When all products are sold at split off stage)

Products	*P (₹)*	*Q (₹)*	*R (₹)*	*S (₹)*	*Total (₹)*
Number of units	10,00,000	20,000	10,000	18,000	-
Sale price per unit at split off stage	₹3	₹9	₹16	₹60	-
Sales value at split off stage	30,00,000	1,80,000	1,60,000	10,80,000	44,20,000
Less: Joint cost	27,20,000	1,28,000	1,28,000	9,28,000	39,04,000
Annual Income	***2,80,000***	***52,000***	***32,000***	***1,52,000***	***5,16,000***
Increase/(Decrease) in Income (5,16,000 – 9,76,000)					***(4,60,000)***

(c) Strategy to maximize profits: Best production plan will be to sell P and S after further processing and Q and R at the point of split off.

(d) Statement Showing Net Increase in Income (If strategy is adopted)

Products	*P (₹)*	*Q (₹)*	*R (₹)*	*S (₹)*	*Total (₹)*
Sales value	46,00,000	1,80,000	1,60,000	12,00,000	63,60,000
Less: Further cost	12,00,000	-	-	40,000	14,80,000
Less: Joint cost	27,20,000	1,28,000	1,28,000	9,28,000	39,04,000
Annual Income	***6,80,000***	***52,000***	***32,000***	***2,32,000***	***9,96,000***
Net Increase in Income (9,96,000 – 9,76,000)					***20,000***

BQ 13

'Buttery Butter' is engaged in the production of Buttermilk, Butter and Ghee. It purchases processed cream and let it through the process of churning until it separates into buttermilk and butter. For the month of January, 2023, 'Buttery Butter' purchased 50 Kilolitre processed cream @ ₹100 per 1,000 ml. Conversion cost of ₹1,00,000 were incurred upto the split off point, where two saleable products were produced i.e. buttermilk and butter. Butter can be further processed into Ghee.

The January, 2023 production and sales information is as follows:

Products	Production (in Kilolitre/tonne)	Sales Quantity (in Kilolitre/tonne)	Selling price per Litre/Kg (₹)
Buttermilk	28	28	30
Butter	20	-	-
Ghee	16	16	480

All 20 tonne of butter were further processed at an incremental cost of ₹1,20,000 to yield 16 Kilolitre of Ghee. There was no opening or closing inventories of buttermilk, butter or ghee in January, 2023.

Required:

(a) Show how joint cost would be apportioned between Buttermilk and Butter under ***Estimated Net Realisable Value method.***

(b) 'Healthy Bones' offers to purchase 20 tonne of butter in February at ₹360 per kg. In case 'Buttery Butter' accepts this offer, no Ghee would be produced in February. Suggest whether 'Buttery Butter' shall accept the offer affecting its operating income or further process butter to make Ghee itself?

Answer

(a) Statement Showing Apportionment of Joint Cost
(Estimated Net Realisable Value Method)

Particulars	Buttermilk Amount (₹)	Butter Amount (₹)
Sales Value	8,40,000 (₹30 × 28 × 1000)	76,80,000 (₹480 × 16 × 1000)
Less: Post split-off cost (Further processing cost)	-	(1,20,000)
Net Realisable Value	8,40,000	75,60,000
Apportionment of Joint Cost of ₹51,00,000 in ratio of 1:9	***5,10,000***	***45,90,000***

Joint cost = (₹100 × 50 × 1000) + ₹1,00,000 = ***₹51,00,000***

(b) Further processing of Butter into Ghee decision:

Incremental revenue	=	₹480 × 16 × 1000 - ₹360 × 20 × 1000	=	₹4,80,000
Incremental cost	=	₹1,20,000		
Incremental benefit	=	₹4,80,000 - ₹1,20,000	=	₹3,60,000

The operating income of 'Buttery Butter' will be reduced by ₹3,60,000 in February if it sells 20 tonne of Butter to 'Healthy Bones', instead of further processing of Butter into Ghee for sale. Thus, 'Buttery Butter' is advised ***not to accept*** the offer and further process butter to make Ghee itself.

BQ 14

Inorganic Chemicals purchases salt and processes it into more refined products such as Caustic Soda, Chlorine and PVC (Polyvinyl chloride). During the month of July, Inorganic Chemicals purchased Salt for ₹40,000. Conversion costs of ₹60,000 were incurred upto the split off point, at which time two saleable products were produced viz. Caustic soda and Chlorine. Chlorine can be further processed in PVC. The July production and sales information is as follows:

	Production (tonnes)	Sales Quantity (tonnes)	Selling price (per tonne)
Caustic Soda	1,200	1,200	₹50
Chlorine	800	-	-
PVC	500	500	₹200

All 800 tonnes of Chlorine were further processed at an incremental cost of ₹20,000 to yield 500

tonnes of PVC. There were no by products or scrap from this further processing of Chlorine. There were no beginning or ending inventories of Caustic Soda, Chlorine or PVC in July.

There is an active market for Chlorine. Inorganic Chemicals could have sold all its July production of Chlorine at ₹75 a tonne.

Required

1. To calculate how the joint cost of ₹1,00,000 would be allocated between Caustic Soda and Chlorine under each of the following methods:

(a) Sales value at split off point;
(b) Physical unit method; and
(c) Estimated NRV.

2. Lifetime Swimming Pool Products offers to purchase 800 tonnes of Chlorine in August at ₹75 per ton. This sale would mean that no PVC would be produced in August. Explain how would accepting the offer affect August's operating income?

Answer

1. Statement Showing Allocation of Joint Cost

Particulars	***Joint Products***	
	Caustic Soda	***Chlorine***
(a) Allocation of joint cost on the basis of sale value at split off point:	(1,200 × 50)	(800 × 75)
Sale Value of production at split off (production × sales price)	60,000	60,000
Share of joint cost of ₹1,00,000 in ratio ***(60 : 60)***	***50,000***	***50,000***
(b) Allocation of joint cost on ten basis of physical measure:		
Output at split off point	1,200 tonnes	800 tonnes
Share of joint cost of ₹1,00,000 in ratio ***(12 : 8)***	***60,000***	***40,000***
(c) Allocation of joint cost on the basis of estimated NRV:		
Sale Value of production after further processing	(1,200 × 50)	(500 × 200)
(output after further processing × sales price)	60,000	1,00,000
Less: Further processing cost	-	20,000
Net Realizable Value (NRV)	60,000	80,000
Share of joint cost of ₹1,00,000 in ratio ***(60 : 80)***	***42,857***	***57,143***

2. Analysis of Life Swimming Pool Products

Sale value of 500 tons of PVC @ ₹200 per tonne	1,00,000
Less: Sale Value of 800 tons of Chlorine	60,000
Incremental Revenue	***40,000***
Cost of further processing chlorine into PVC	20 000
Increase in net income due to further processing of chlorine into PVC	***20,000***

The operating income of Inorganic Chemicals will be reduced by ₹20,000 in August if it sells 800 tons of Chlorine to Lifetime Swimming Pool Products, instead of further processing of Chlorine into PVC for sale.

BQ 15

Sun-moon Ltd. produces and sells the following products:

Products	***Units***	***Selling price at split-off point (₹)***	***Selling price after further processing (₹)***
A	2,00,000	17	25

B	30,000	13	17
C	25,000	8	12
D	20,000	10	-
E	75,000	14	20

Raw material costs ₹35,90,000 and other manufacturing expenses cost ₹5,47,000 in the manufacturing process which are absorbed on the products on the basis of their ***'Net realisable value'***. The further processing costs of A, B, C and E are ₹12,50,000; ₹1,50,000; ₹50,000 and ₹1,50,000 respectively. Fixed costs are ₹4,73,000.

You are required to prepare the following in respect of the coming year:

(a) Statement showing income forecast of the company assuming that none of its products are to be further processed.

(b) Statement showing income forecast of the company assuming that products A, B, C and E are to be processed further.

(c) Can you suggest any other production plan whereby the company can maximise its profits? If yes, then submit a statement showing income forecast arising out of adoption of that plan.

Answer

(a) Statement Showing Income Forecast of the Company
(Assuming that none of its products are further processed)

Products	***A (₹)***	***B (₹)***	***C (₹)***	***D (₹)***	***E (₹)***	***Total (₹)***
Number of units	2,00,000	30,000	25,000	20,000	75,000	-
Sale price per unit	17	13	8	10	14	-
Sales revenue	34,00,000	3,90,000	2,00,000	2,00,000	10,50,000	52,40,000
Less: Apportioned cost	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
	7,75,000	1,38,000	25,000	60,000	1,05,000	11,03,000
Less: Fixed cost						4,73,000
Profit						***6,30,000***

(b) Statement Showing Income Forecast of the Company
(Assuming that products A, B, C and E are further processed)

Products	***A (₹)***	***B (₹)***	***C (₹)***	***D (₹)***	***E (₹)***	***Total (₹)***
Number of units	2,00,000	30,000	25,000	20,000	75,000	-
Sale price per unit	25	17	12	10	20	-
Sales revenue	50,00,000	5,10,000	3,00,000	2,00,000	15,00,000	75,10,000
Less: Apportioned cost	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
Less: Further cost	12,50,000	1,50,000	50,000	-	1,50,000	16,00,000
	11,25,000	1,08,000	75,000	60,000	4,05,000	17,73,000
Less: Fixed cost						4,73,000
Profit						***13,00,000***

(c) Suggested production plan for maximising profits: On comparing the figures of excess of revenue over cost of manufacturing in the above statements one observes that the concern is earning more after further processing of A, C and E products but is loosing a sum of ₹30,000 in the case of product B (if it is processed further). Hence the best production plan will be to sell A, C and E after further processing and B and D at the point of split off. The profit statement based on this suggested production plan is as below:

Profit Statement Based on Suggested Production Plan

Products	***A (₹)***	***B (₹)***	***C (₹)***	***D (₹)***	***E (₹)***	***Total (₹)***
Number of units	2,00,000	30,000	25,000	20,000	75,000	-
Sale price per unit	25	13	12	10	20	-

Sales revenue	50,00,000	3,90,000	3,00,000	2,00,000	15,00,000	73,90,000
Less: Apportioned cost	26,25,000	2,52,000	1,75,000	1,40,000	9,45,000	41,37,000
Less: Further cost	12,50,000	-	50,000	-	1,50,000	14,50,000
	11,25,000	1,38,000	75,000	60,000	4,05,000	18,03,000
Less: Fixed cost						4,73,000
Profit						***13,30,000***

Hence the profit of the company has increased by ₹30,000

Working note:

Statement Showing Apportionment of Joint Cost
(Net Realisable Value Method)

Products	***A (₹)***	***B (₹)***	***C (₹)***	***D (₹)***	***E (₹)***
Number of units	2,00,000	30,000	25,000	20,000	75,000
Sale price per unit	25	17	12	10	20
Sales revenue	50,00,000	5,10,000	3,00,000	2,00,000	15,00,000
Less: Further cost	12,50,000	1,50,000	50,000	-	1,50,000
Net Realisable Value	37,50,000	3,60,000	2,50,000	2,00,000	13,50,000
Joint cost (in NRV proportion)	***26,25,000***	***2,52,000***	***1,75,000***	***1,40,000***	***9,45,000***

Joint cost = Raw material cost + other manufacturing expenses
= 35,90,000 + 5,47,000
= ***41,37,000***

BY PRODUCTS

BQ 16

A Factory is engaged in the production of a chemical BOMEX and in the course of its manufacture, a by-product BRUCIL is produced, which after further processing has commercial value. For the month of April 2023, the following are the summarised cost data.

	Joint Expenses	***Separate Expenses***	
		BOMEX	***BRUCIL***
Materials	1,00,000	6,000	4,000
Labour	50,000	20,000	18,000
Overheads	30,000	10,000	6,000
Selling price per unit		98	34
Estimated profit per unit on sale of BRUCIL			4
No. of units produced		2,000	2,000

The factory uses reverse cost method of accounting for by-products where by the sales value of by-products after deduction of the estimated profit, post separation cost and selling and distribution expenses relating to the by product is credited to the joint process account.

You are required to prepare statements showing:

(1) The joint cost allocable to BOMEX.
(2) The product wise and overall profitability of the factory for April 2023.

Answer

(1) Statement of Allocation of Joint Cost to BOMEX

Particulars		Amount (₹)
Sales value of BRUCIL	(2,000 units × ₹34)	68,000
Less: Estimated profit	(2,000 units × ₹4)	8,000
Less: Separate cost	(₹4,000 + ₹18,000 + ₹6,000)	28,000
Joint Cost of BRUCIL		**32,000**
Total Joint Cost	(₹1,00,000 + ₹50,000 + ₹30,000)	1,80,000
Less: Joint cost allocable to BRUCIL		32,000
Joint Cost allocable to BOMEX		**1,48,000**

(2) Product-wise & Overall Profitability Statement

Particulars	BOMEX	BRUCIL	Total
Sales value	1,96,000	68,000	2,64,000
Less: Separate cost	36,000	28,000	64,000
Less: Joint cost	1,48,000	32,000	1,80,000
Profit	**12,000**	**8,000**	**20,000**

BQ 17

Smile company produces two main products and a by-product out of a joint process. The ratio of output quantities to input quantities of direct material used in the joint process remains consistent on yearly basis. Company has employed the physical volume method to allocate joint production costs to the main products. The net realizable value of the by-product is used to reduce the joint production costs before the joint costs are allocated to the main products. Details of company's operation are given in the table below. During the month, company incurred joint production costs of ₹10,00,000. The main products are not marketable at the split off point and thus have to be processed further.

Particulars	Product A	Product B	By Product
Monthly output in kg.	60,000	1,20,000	50,000
Selling price per kg.	₹ 50	₹ 30	₹ 5
Process costs	₹ 2,00,000	₹ 3,00,000	

Find out the amount of joint product cost that Smile company would allocate to the product B by using the physical volume method to allocate joint production costs?

Answer

Calculation of Net joint costs to be allocated:

Particulars	Amount (₹)
Joint Costs	10,00,000
Less: Net Realizable value of by-product (50,000×5)	2,50,000
Net joint costs to be allocated	7,50,000

$$\text{Joint cost allocable to Product B} = \frac{\text{Net joint cost allocable to products}}{\text{Total Units}} \times \text{Physical qty of Product B}$$

$$= \frac{7,50,000}{60,000+1,20,000} \times 1,20,000$$

$$= \textbf{₹5,00,000}$$

BQ 18

NN Manufacturing company uses joint production process that produces three products at the split off point. Joint productions costs during September were ₹8,40,000. Product information for September was as follows:

Particulars	Product A	Product B	Product C
Units produced	1,500	3,000	4,500
Units sold	2,000	6,000	7,500
Sales prices:			
At the split-off	₹100	-	-
After further processing	₹150	₹ 175	₹50
Costs to process after split-off	₹1,50,000	₹1,50,000	₹1,50,000

Assume that product C is treated as a by-product and the company accounts for the by-product at net realizable value as a reduction of joint cost. Assume also that Product B & C must be processed further before they can be sold. Find out the total cost of Product A in September if joint cost allocation is based on net realizable values.

Answer

Calculation of Net joint costs to be allocated:

Particulars	Amount (₹)
Joint Costs	8,40,000
Less: Net Realizable value of by-product {(4,500×50) – 1,50,000}	75,000
Net joint costs to be allocated	7,65,000

Note: Product A can be sold at the split-off point, because the question says that "Products B and C must be processed further before they can be sold." Since product A is not included in that, we know that Product A can be sold at the split-off point. Furthermore, the cost to process Product A after the split-off point is ₹150,000, whereas the additional revenue to be earned by processing it further is only ₹75,000 (₹50 increase in selling price per unit multiplied by the 1,500 units produced during September). ***Therefore, Product A will not be processed further***, and we use the sales value at split-off for A for allocating the joint costs. The sales value at the split-off for A is ₹100 × 1,500 units, or ₹1,50,000.

Statement Showing Total Cost of Product A
(Estimated Net Realisable Value Method)

Particulars	Product A Amount (₹)	Product B Amount (₹)
Sales Value of units Produced	1,50,000	5,25,000
(Product A at split off and B after further processing)	(₹100 × 1,500)	(₹175 × 3,000)
Less: Further processing cost	-	(1,50,000)
Net Realisable Value	1,50,000	3,75,000
Apportionment of Joint Cost of ₹7,65,000 in ratio of 2:5	***2,18,571***	***5,46,429***
Add: Further processing cost	***-***	***1,50,000***
Total Cost of product	***2,18,571***	***6,96,429***

PAST YEAR QUESTIONS

PYQ 1

A company manufactures one main product (M1) and two by-products B1 and B2 for the month of January 2013, following details are available:

Total Cost upto Separation Point ₹2,12,400

Particulars	M1	B1	B2
Cost after separation	-	₹35,000	₹24,000
No. of units produced	4,000	1,800	3,000
Selling price per units	₹100	₹40	₹30
Estimated net profit as percentage to sales value	-	20%	30%
Estimated selling expenses as percentage to sales value	20%	15%	15%

There are no beginning or closing inventories.

Prepare statement showing:

I. Allocation of joint cost; and
II. Product-wise and overall profitability of the company for January 2013.

[(8 Marks) May 2013/May 2015]

Answer

I. Statement of Allocation of Joint Cost

Particulars	B1	B2
Sales @ ₹40/₹30 per unit	72,000	90,000
Less: Estimated profit @ 20%/30%	14,400	27,000
Less: Estimated selling expenses @ 15% on sales	10,800	13,500
Less: Further estimated cost (cost after separation)	35,000	24,000
Joint Cost	**11,800**	**25,500**
Total Joint Cost		2,12,400
Less: Joint cost allocable to B1		11,800
Less: Joint cost allocable to B2		25,500
Joint Cost allocable to M1		**1,75,100**

II. Product-wise & Overall Profitability Statement

Particulars	M1	B1	B2	Total
Sales	4,00,000	72,000	90,000	5,62,000
Less: Selling expenses @ 20%/15%/15%	80,000	10,800	13,500	1,04,300
Less: Cost after separation	Nil	35,000	24,000	59,000
Less: Joint cost	1,75,100	11,800	25,500	2,12,400
Profit	**1,44,900**	**14,400**	**27,000**	**1,86,300**

PYQ 2

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

Individual departmental expenses are as follows:

	Department X (In Lakh)	Department Y (In Lakh)
Direct materials	₹95.00	₹14.00
Direct labour	₹80.00	₹27.00
Variable overheads	₹100.00	₹35.00
Fixed overheads	₹75.00	₹52.00
Total	***₹350.00***	***₹128.00***

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

Product 'P1'	₹28.38 lakh
Product 'P2'	₹25.00 lakh
Product 'YP1'	₹19.00 lakh

The selling prices per kg are as under:

Product 'P1'	₹110
Product 'P2'	₹325
Product 'YP1'	₹150

You are required to:

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

[(8 Marks) June 2015]

Answer

Input in Department X	=	9,00,000 kgs		
Yield	=	90%		
Therefore Output	=	90% of 9,00,000 kgs	=	8,10,000 kgs
Ratio of output for 'P1' and 'P2'	=	***60 : 40***		
Product of 'P1'	=	60% of 8,10,000 kgs	=	4,86,000 kgs
Product of 'P2'	=	40% of 8,10,000 kgs	=	3,24,000 kgs

(1) Statement Showing Apportionment of Joint Cost

Particulars	***Product 'P1' (₹in Lakh)***	***Product 'P2' (₹in Lakh)***
Sales value at split-off-point	(4,86,000 × 110)	(3,24,000 × 325)
	534.60	1,053.00
Less: Selling expenses if sold at split-off-point	(28.38)	(25.00)
Net sales at split-off-point	506.22	1,028.00
Share of joint cost of *₹1,205 lakh (in 506.22 : 1,028)	***397.59***	***807.41***

**** Calculation of joint cost:***

Raw materials (9,00,000 kgs × ₹95)	=	855 lakh
Process cost of department X	=	350 lakh
Joint cost	=	***1,205 lakh***

(2) Statement of Profitability at Split Off Point

Particulars	Product 'P1' (₹in Lakh)	Product 'P2' (₹in Lakh)
Sales value at split-off-point	(4,86,000 × 110) 534.60	(3,24,000 × 325) 1,053.00
Less: Selling expenses if sold at split-off-point	(28.38)	(25.00)
Less: Joint Cost	(397.59)	(807.41)
Profit	**108.63**	**220.59**

(3) Statement of Profitability of 'YP1'

Particulars	Product 'YP1' (₹in Lakh)
Sales value (4,61,700 × 150)	692.55
Less: Further processing cost in department Y	(128.00)
Less: Selling expenses if sold after further processing	(19.00)
Less: Joint Cost	(397.59)
Profit	**147.96**

Calculation of output of product 'YP1':

Output = 95% of 4,86,000 kgs = **4,61,700 kgs**

(4) Further Processing Decision: Product 'P1' should be sold after further processing as product 'YP1' having higher profit.

PYQ 3

A factory producing article A also produces a by-product B which is further processed into finished product.

The joint costs of manufacture are given below:

Material	₹5,000
Labour	₹3,000
Overheads	₹2,000
	₹10,000

Subsequent costs are given below:

	A	B
Material	₹3,000	₹1,500
Labour	₹1,400	₹1,000
Overheads	₹600	₹500
	₹5,000	**₹3,000**

Selling Price:

Product A	₹16,000
Product B	₹8,000

Estimated profits on selling prices:

Product A	25%
Product B	20%

Assume that selling and distributing expenses are in proportion of sales prices. Show how you would apportion joint costs of manufacture and prepare a statement showing cost of production of A and B.

[(8 Marks) May 2016]

Answer

Statement Showing Apportionment of Joint Cost

Particulars	Article A	By-product B
Sales value	16,000	8,000
Less: Profit @ 25% of 16,000 & 20% of 8,000	4,000	1,600
Less: Selling expenses (400 in 16 : 8)	267	133
Less: Subsequent cost	5,000	3,000
Joint cost	**6,733**	**3,267**

**** Calculation of selling expenses:***

Selling expenses = Total sales – Total profit – Total subsequent cost – Total joint cost
= (16,000 + 8,000) – (4,000 + 1,600) – (5,000 + 3,000) – 10,000
= ***400***

Statement Showing Cost of Production

Particulars	Article A	By-product B
Joint cost	6,733	3,267
Subsequent cost	5,000	3,000
Cost of Production	**11,733**	**6,267**

PYQ 4

A Ltd produces 'M' as a main product and gets two by products 'P' and 'Q' in the course of processing. Following information are available for the month of October 2017:

Particulars	M	P	Q
Cost after separation	-	₹60,000	₹30,000
No. of units produced	4,500	2,500	1,500
Selling price per units	₹170	₹80	₹50
Estimated net profit as percentage to sales value	-	30%	25%

The joint cost upto separation point amounts to ₹2,50,000. Selling expenses amounting to 85,000 are to be apportioned to the three products in the ratio of sales units. There are no beginning or closing inventories.

Prepare statement showing:

(i) Allocation of joint cost;
(ii) Product-wise and overall profitability and
(iii) Advise the company regarding results if the by product 'P' is not further processed and is sold at the point of separation at ₹60 per unit without incurring selling expenses.

[(8 Marks) Nov 2017]

Answer

(i) Statement of Allocation of Joint Cost

Particulars	P	Q
Sales @ ₹80/₹50 per unit	2,00,000	75,000
Less: Estimated profit @ 30%/25%	60,000	18,750
Less: Estimated selling 85,000 in (4,500 : 2,500 : 1,500)	25,000	15,000
Less: Further estimated cost (cost after separation)	60,000	30,000
Joint Cost	**55,000**	**11,250**
Total Joint Cost		2,50,000
Less: Joint cost allocable to P		55,000
Less: Joint cost allocable to Q		11,250
Joint Cost allocable to M		**1,83,750**

(ii) Product-wise & Overall Profitability Statement

Particulars	M	P	Q	Total
Sales	7,65,000	2,00,000	75,000	10,40,000
Less: Selling expenses	45,000	25,000	15,000	85,000
Less: Cost after separation	Nil	60,000	30,000	90,000
Less: Joint cost	1,83,750	55,000	11,250	2,50,000
Profit	**5,36,250**	**60,000**	**18,750**	**6,15,000**

(iii) Further processing decision in respect of by product 'P':

Reduction in revenue = 2,500 units (₹80 - ₹60) = ₹50,000

Reduction in cost = Further processing cost + Selling expenses

= 60,000 + 25,000 = ₹85,000

Decision: Since, reduction in cost is higher than reduction in revenue therefore, By product 'P' should be sold at split of stage (by following such decision company can increase its income by ₹35,000).

PYQ 5

A Factory is engaged in the production of a chemical BOMEX and in the course of its manufacture, a by-product CROMEX is produced which after further processing has commercial value. For the month of April 2019, the following are the summarised cost data.

	Joint Expenses	Separate Expenses	
		BOMEX	CROMEX
Materials	1,00,000	6,000	4,000
Labour	50,000	20,000	18,000
Overheads	30,000	10,000	6,000
Selling price per unit		100	40
Estimated profit per unit on sale of CROMEX			5
No. of units produced		2,000	2,000

The factory uses net realizable value method for apportionment of joint cost to by-products.

You are required to prepare statements showing:

(1) Joint cost allocable to CROMEX.

(2) Product wise and overall profitability of the factory for April 2019.

[(5 Marks) May 2019]

Answer

(1) Statement of Allocation of Joint Cost to CROMEX

Particulars	Amount (₹)	Amount (₹)
Number of units produced	2,000	2,000
Sale price per unit	₹100	₹40
Sales value	2,00,000	80,000
Less: Separate cost	36,000	28,000
Net realizable value	**1,64,000**	**52,000**
Joint Cost ₹1,80,000 in 1,64,000 : 52,000	**1,36,667**	**43,333**

(2) Product-wise & Overall Profitability Statement

Particulars	BOMEX	CROMEX	Total
Sales value	2,00,000	80,000	2,80,000
Less: Separate cost	36,000	28,000	64,000
Less: Joint cost	1,36,667	43,333	1,80,000
Profit	**27,333**	**8,667**	**36,000**

PYQ 6

A factory produces two, 'A' and 'B' from a single process. The joint processing costs during a particular month are:

Direct material	₹30,000
Direct labour	₹9,600
Variable overheads	₹12,000
Fixed overheads	₹32,000

Sales: A – 100 units @ ₹600 per unit; B – 120units @ ₹200 per unit.

Apportion joints costs on the basis of:

(1) Physical quantity of each product.
(2) Contribution margin method, and
(3) Determine profit or loss under both the methods. ***[(5 Marks) Nov 2019]***

Answer

(1) Statement Showing Apportionment of Joint Cost (Based on Physical Quantity Method)

Particulars	Product A	Product B
Number of units	100	120
Apportionment of Joint Cost ₹83,600 in 100 : 120	***₹38,000***	***₹45,600***

(2) Statement Showing Apportionment of Joint Cost (Based on Contribution Margin Method)

Particulars	Product A	Product B
Number of units	100	120
(A) Variable Joint Cost ₹51,600 in 100 : 120	***₹23,455***	***₹28,145***
Sales	₹60,000	₹24,000
Less: Variable joint cost	₹23,455	₹28,145
Contribution	***₹36,545***	***(₹4,145)***
(B) Fixed Joint Cost ₹32,000 to Product A only	***₹32,000***	***-***
(C) Total Joint Cost (A) + (B)	***₹55,455***	***₹28,145***

Note: * The fixed cost of ₹32,000 is to be apportioned over the joint products A and B in the ratio of their contribution margin but contribution margin of Product B is Negative so fixed cost will be charged to Product A only.

(3) Statement Showing Profit under Both Methods

Particulars	Product A	Product B
(1) Profit under physical quantity method:		
Sales	60,000	24,000
Less: Joint cost	38,000	45,600
Profit/ (loss)	***₹22,000***	***(₹21,600)***
(2) Profit under contribution margin method:		
Sales	60,000	24,000
Less: Joint cost	55,455	28,145
Profit/ (loss)	***₹4,545***	***(₹4,145)***

Working note:

Variable joint cost = Direct material + Direct wages + Variable overheads
= ₹30,000 + ₹9,600 + ₹12,000 = ***₹51,600***

Total joint cost	=	Variable joint cost + Fixed overheads		
	=	₹51,600 + ₹32,000	=	***₹83,600***

PYQ 7

A company's plant processes 6,750 units of raw material in a month to produce two products 'M' and 'N'.

The process yield is as under:

Product M	80%
Product N	12%
Process Loss	8%

Processing cost is ₹2,25,000 of which labour cost is accounted for 66%. Labour is chargeable to products 'M' and 'N' in ratio of 100 : 80. The cost of material is ₹80 per unit

Prepare a comprehensive cost statement for each products showing:

(i) Apportionment of joint cost among products 'M' and 'N' and
(ii) Total cost of the products 'M' and 'N'

[(5 Marks) Nov 2020]

Answer

Statement Showing Apportionment of Joint Cost and Total Cost of 'M' and 'N'

Particulars		***Basis***	***'M'***	***'N'***	***Total***
Material	(6,750 × ₹80)	5,400:810	4,69,565	70,435	5,40,000
Processing Cost except Labour	(2,25,000 × 34%)	5,400:810	66,522	9,978	76,500
Labour	(2,25,000 × 66%)	100:80	82,500	66,000	1,48,500
Joint Cost			***₹6,18,587***	***₹1,46,413***	***₹7,65,000***

Note: Cost of materials and processing cost except labour are apportioned between M and N in proportion of physical units i.e. 5,400 units of M (80% of 6,750) and 810 units of N (12% of 6,750).

PYQ 8

Mayura Chemicals Ltd buys a particular raw material at ₹8 per litre. At the end of the processing in Department 1, this raw material splits-off into products X, Y and Z. Product X is sold at the split-off point, with no further processing. Products Y and Z require further processing before they can be sold. Product Y is processed in Department 2, and Product Z is processed in Department 3.

Following is a summary of the costs and other related data for the year 2019-20:

Particulars	***Departments***		
	1	***2***	***3***
Cost of Raw Material	₹4,80,000	-	-
Direct Labour	₹70,000	₹4,50,000	₹6,50,000
Manufacturing Overheads	₹48,000	₹2,10,000	₹4,50,000
	Products		
	X	***Y***	***Z***
Sales (Litres)	10,000	15,000	22,500
Closing Inventory (Litres)	5,000	-	7,500
Sale price per litre (₹)	30	64	50

There were no opening and closing inventories of basic raw materials at the beginning as well as at the end of the year. All finished goods inventory in litres was complete as to processing. The company uses the Net realisable value method of allocating joint costs.

You are required to prepare:

(1) Schedule showing the allocation of joint costs.
(2) Calculate the Cost of goods sold of each product and the cost of each item in Inventory.
(3) A comparative statement of Gross profit. ***[(10 Marks) Jan 2021]***

Answer

(1) Statement of Allocation of Joint Cost

Particulars	***X***	***Y***	***Z***	***Total***
Production in litres (Sales + Closing Inventory)	15,000	15,000	30,000	-
Sale price per litre	₹30	₹64	₹50	-
Sales value of total production (in ₹)	4,50,000	9,60,000	15,00,000	29,10,000
Less: Further cost (in ₹):				
Cost of Dept. 2 (4,50,000 + 2,10,000)	-	(6,60,000)	-	(6,60,000)
Cost of Dept. 3 (6,50,000 + 4,50,000)	-	-	(11,00,000)	(11,00,000)
Net realizable value (in ₹)	***4,50,000***	***3,00,000***	***4,00,000***	***11,50,000***
Joint Cost ₹5,98,000* in 45 : 30 : 40	***2,34,000***	***1,56,000***	***2,08,000***	***5,98,000***

****Joint cost*** = Cost of dept. 1 = ₹4,80,000 + ₹70,000 + ₹48,000 = ***₹5,98,000***

(2) Statement of Cost of Goods Sold and Cost of Inventory

Particulars	***X (₹)***	***Y (₹)***	***Z (₹)***	***Total (₹)***
Joint Cost	2,34,000	1,56,000	2,08,000	5,98,000
Add: Further cost:	-	6,60,000	11,00,000	17,60,000
Total Cost	***2,34,000***	***8,16,000***	***13,08,000***	***23,58,000***
Cost of Goods Sold	***1,56,000*** $\left(2,34,000 \times \frac{10,000}{15,000}\right)$	***8,16,000***	***9,81,000*** $\left(13,08,000 \times \frac{22,500}{30,000}\right)$	***19,53,000***
Closing Inventory	***78,000*** $\left(2,34,000 \times \frac{5,000}{15,000}\right)$	***-***	***3,27,000*** $\left(13,08,000 \times \frac{7,500}{30,000}\right)$	***4,05,000***

(3) Statement of Gross Profit

Particulars	***X***	***Y***	***Z***	***Total***
Sales	₹3,00,000 (10,000 × ₹30)	₹9,60,000 (15,000 × ₹64)	₹11,25,000 (22,500 × ₹50)	₹23,85,000
Less: Cost of Goods Sold	₹1,56,000	₹8,16,000	₹9,81,000	₹19,53,000
Gross Profit	***₹1,44,000***	***₹1,44,000***	***₹1,44,000***	***₹4,32,000***

PYQ 9

OPR Ltd. purchases crude vegetable oil. It does refining of the same. The refining process results in four products at split-off point: S, P, N and A. Product 'A' is fully processed at split-off point. Product S, P and N can be individually further refined into SK, PM, and NL respectively. The joint cost of purchasing the crude vegetable oil and processing it were ₹40,000. Other details are as follows:

Products	***Further processing cost (₹)***	***Sales at split off point (₹)***	***Sales after further processing (₹)***
S	80,000	20,000	1,20,000
P	32,000	12,000	40,000
N	36,000	28,000	48,000
A	-	20,000	-

You are required to identify the products which can be further processed for maximizing profits and make suitable suggestions.

[(5 Marks) July 2021]

Answer

Statement Showing Further Processing Decision

Product	Calculation Incremental Revenue and Incremental Cost		Status	Decision
S	IR = 1,20,000 – 20,000 IC = 80,000	= 1,00,000 = 80,000	IR > IC	Yes
P	IR = 40,000 – 12,000 IC = 32,000	= 28,000 = 32,000	IR < IC	No
N	IR = 48,000 – 28,000 IC = 36,000	= 20,000 = 36,000	IR < IC	No

Suggestion: Product S should be processed further and Product P, N and A at split off point to maximize profit.

PYQ 10

RST Limited produces three joint products X, Y and Z. The products are processed further. Pre-separation costs are apportioned on the basis of weight of output of each joint product. The following data are provided for the month of April, 2022.

Cost incurred up to separation point: ₹10,000

	Product X	Product Y	Product Z
Output (in Litre)	100	70	80
Cost incurred after separation point	2,000	1,200	800
Selling Price per Litre:			
After further processing	50	80	60
At pre-separation point (estimated)	25	70	45

You are required to:

(a) Prepare a statement showing profit or loss made by each product after further processing using the presently adopted method of apportionment of pre-separation cost.

(b) Advise the management whether, on purely financial consideration, the three products are to be processed further or not.

[(5 Marks) May 2022]

Answer

(a) Statement Showing Profit or Loss made by each Product after Further Processing

Particulars	Product X	Product Y	Product Z
Output in units	100	70	80
Sales after further processing (₹)	5,000	5,600	4,800
Less: Further processing cost (₹)	(2,000)	(1,200)	(800)
Less: Joint cost (₹10,000 in proportion of 100:70:80)	(4,000)	(2,800)	(3,200)
Profit/(Loss) (₹)	***(1,000)***	***1,600***	***800***

(b) Further Processing Decision

Products	Incremental revenue	Incremental cost	Situation	Decision
X	100 (₹50 - ₹25) = ₹2,500	₹2,000	IR > IC	Yes
Y	70 (₹80 - ₹70) = ₹700	₹1,200	IR < IC	No
Z	80 (₹60 - ₹45) = ₹1,200	₹800	IR > IC	Yes

Advise: It is advisable to further process only product X and Z and to sale product Y at the point of separation.

PYQ 11

ASR Ltd mainly produces Product 'L' and gets a by-Product 'M' out of a joint process. The net realizable value of the by-product is used to reduce the joint production costs before the joint costs are allocated to the main product. During the month of October 2022, company incurred joint production costs of ₹4,00,000. The main Product 'L' is not marketable at the spilt off point. Thus, it has to be processed further. Details of company's operation are as under:

Particulars	Product L	By- Product M
Production (units)	10,000	200
Selling pricing per kg	₹45	₹5
Further Processing cost	₹1,01,000	-

You are required to find out:

(a) Profit earned from Product 'L'

(b) Selling price per kg of product 'L', if the company wishes to earn a profit of ₹1,00,000 from the above production.

[(5 Marks) Nov 2022]

Answer

(a) Statement Showing Profit Earned from Product 'L'

Particulars	Amount
Sales Value of Product 'L' (10,000 × ₹45)	4,50,000
Less: Further Processing Cost	(1,01,000)
Less: Net Joint Cost (₹4,00,000 – 200 × ₹5)	(3,99,000)
Profit	***(50,000)***

(b) Statement Showing Selling Price of Product 'L'

Particulars	Amount
Further Processing Cost	1,01,000
Add: Net Joint Cost (₹4,00,000 – 200 × ₹5)	3,99,000
Add: Desired Profit	1,00,000
Sales Value	6,00,000
Selling Price (₹6,00,000 ÷ 10,000 units)	***₹60***

PYQ 12

ABC Company produces a Product 'X' that passes through three processes: R, S and T. Three types of raw materials, viz., J, K, and L are used in the ratio of 40:40:20 in process R. The output of each process is transferred to next process. Process loss is 10% of total input in each process. At the stage of output in process T, a by-product 'Z' is emerging and the ratio of the main product 'X' to the by-product 'Z' is 80: 20. The selling price of product 'X' is ₹ 60 per kg. The company produced 14,580 kgs of product 'X'.

Material price: Material J @ ₹15 per kg; Material K @ ₹9 per kg; Material L @ ₹7 per kg. Process costs are as follows:

Process	Variable cost per kg (₹)	Fixed cost of Input (₹)
R	5.00	42,000
S	4.50	5,000
T	3.40	4,800

The by-product 'Z' cannot be processed further and can be sold at ₹30 per kg at the split-off stage. There is no realizable value of process losses at any stage.

Present a statement showing the apportionment of joint costs on the basis of the sales value of product 'X' and by-product 'Z' at the split-off point and the profitability of product 'X' and by-product 'Z'.

[(10 Marks) May 2023]

Answer

Statement Showing Apportionment of Joint Cost and Profitability

Particulars	Product X	By-Product Z
Number of units produced at split off point (in kg)	14,580	3,645
Market value at separation point per kg	₹60	₹30
Total market value at separation point	₹8,74,800	₹1,09,350
Apportionment of Joint Cost ₹6,21,900 in sales ratio	**₹5,52,800**	**₹69,100**
Profit (Sales value – Joint cost)	**₹3,22,000**	**₹40,250**

Working Notes:

(a) Output of Product X at split off point = 14,580 kg

∴ Output of By-product Z = (14,580 ÷ 80) × 20 = 3,645 kgs

(b) Input of raw material into each process:

Output of Process T	=	14,580 + 3,645	=	18,225 kgs
Input of process T	=	18,225 ÷ 90%	=	20,250 kgs
Input of Process S	=	20,250 ÷ 90%	=	22,500 kgs
Input of Process R	=	22,500 ÷ 90%	=	25,000 kgs

(c) Calculation of Joint Cost:

Particulars	Process R	Process S	Process T	Total
Material input (in kg)	25,000	22,500	20,250	-
Material cost:				
Material J (25,000 × 40% × ₹15)	1,50,000	-	-	1,50,000
Material K (25,000 × 40% × ₹9)	90,000	-	-	90,000
Material L (25,000 × 20% × ₹7)	35,000	-	-	35,000
Variable cost @ ₹5, ₹4.50, ₹3.40 per kg	1,25,000	1,01,250	68,850	2,95,100
Fixed cost	42,000	5,000	4,800	51,800
Joint Cost	**4,42,000**	**1,06,250**	**73,650**	**6,21,900**

SUGGESTED REVISION FOR EXAM:

BQ: 9, 10, 12, 13, 14, 15, 17, 18

PYQ: 1, 2, 3, 5, 6, 7, 8, 12

CHAPTER 11 BUDGETS & BUDGETARY CONTROL

FLEXIBLE BUDGET

BQ 1

A factory which expects to operate 7,000 hours, i.e., at 70% level of activity, furnishes details of expenses as under:

Variable expenses	₹1,260
Semi-variable expenses	₹1,200
Fixed expenses	₹1,800

The semi-variable expenses go up by 10% between 85% and 95% activity and by 20% above 95% activity.

Construct a flexible budget for 70, 80, 90 and 100 percent activities. Also calculate recovery rate per hour.

Answer

Flexible Budget

Particulars	70%	80%	90%	100%
Operating Hours	**7,000**	**8,000**	**9,000**	**10,000**
Variable Expenses	1,260	1,440	1,620	1,800
Semi Variable Expenses	1,200	1,200	1,320	1,440
Fixed Expense	1,800	1,800	1,800	1,800
Total Cost	**₹4,260**	**₹4,440**	**₹4,740**	**₹5,040**
Recovery Rate (Total Cost ÷ Hours)	**₹0.61**	**₹0.56**	**₹0.53**	**₹0.50**

BQ 2

A department of Company X attains sale of ₹6,00,000 at 80 percent of its normal capacity and its expenses are given below:

Administration Costs:

Office Salaries	90,000
General Expenses	2 percent of sales
Depreciation	7,500
Rates and taxes	8,750

Selling Costs:

Salaries	8 percent of sales
Travelling expenses	2 percent of sales
Sales office expenses	1 percent of sales
General expenses	1 percent of sales

Distribution costs:

Wages	15,000
Rent	1 percent of sales
Other expenses	4 percent of sales

Draw up flexible administration, selling and distribution costs budget, operating at 90 per cent, 100 per cent and 110 per cent of normal capacity.

Answer

Flexible Budget

Particulars	80%	90%	100%	110%
Sales in ₹	6,00,000	6,75,000	7,50,000	8,25,000
(A) Administration cost:				
Office salaries (fixed)	90,000	90,000	90,000	90,000
General expenses (2% of sales)	12,000	13,500	15,000	16,500
Depreciation (fixed)	7,500	7,500	7,500	7,500
Rent and rates (fixed)	8,750	8,750	8,750	8,750
Total (A)	**1,18,250**	**1,19,750**	**1,21,250**	**1,22,750**
(B) Selling cost:				
Salaries (8% of sales)	48,000	54,000	60,000	66,000
Travelling expenses (2% of sales)	12,000	13,500	15,000	16,500
Sales office (1% of sales)	6,000	6,750	7,500	8,250
General expenses (1% of sales)	6,000	6,750	7,500	8,250
Total (B)	**72,000**	**81,000**	**90,000**	**99,000**
(C) Distribution Cost:				
Wages (fixed)	15,000	15,000	15,000	15,000
Rent (1% of sales)	6,000	6,750	7,500	8,250
Other expenses (4% of sales)	24,000	27,000	30,000	33,000
Total (C)	**45,000**	**48,750**	**52,500**	**56,250**
Total Cost (A + B + C)	**2,35,250**	**2,49,500**	**2,63,750**	**2,78,000**

Note: In the absence of information it has been assumed that office salaries, depreciation, rates and taxes and wages remain the same at 110% level of activity also. However, in practice some of these costs may change if present capacity is exceeded.

BQ 3

The budgeted expenses for production of 10,000 units in a factory are furnished below:

Particulars	₹per unit
Material	70
Labour	25
Variable overheads	20
Fixed overheads (₹1,00,000)	10
Variable expenses (direct)	5
Selling expenses (10% fixed)	13
Distribution expenses (20% fixed)	7
Administration expenses (₹50,000)	5
Total	**155**

Prepare a budget for the production of (a) 8,000 units, and (b) 6,000 units. Assume that administration expenses are rigid for all levels of production.

Answer

Flexible Budget

Particulars	6,000 units		8,000 units		10,000 units	
	Per unit	Total	Per unit	Total	Per unit	Total
Materials	70.00	4,20,000	70.00	5,60,000	70.00	7,00,000
Labour	25.00	1,50,000	25.00	2,00,000	25.00	2,50,000
Direct expenses (variable)	5.00	30,000	5.00	40,000	5.00	50,000
Variable overhead	20.00	1,20,000	20.00	1,60,000	20.00	2,00,000

Fixed overhead	16.67	1,00,000	12.50	1,00,000	10.00	1,00,000
Selling expenses:						
Fixed	2.17	13,000	1.63	13,000	1.30	13,000
Variable	11.70	70,200	11.70	93,600	11.70	1,17,000
Distribution expenses:						
Fixed	2.33	14,000	1.75	14,000	1.40	14,000
Variable	5.60	33,600	5.60	44,800	5.60	56,000
Administration expenses	8.33	50,000	6.25	50,000	5.00	50,000
Total Cost	***166.80***	***10,00,800***	***159.43***	***12,75,400***	***155.00***	***15,50,000***

BQ 4

S Ltd. has prepared budget for the coming year for its two products A and B.

	Product A	*Product B*
Production & Sales units	6,000	9,000
Raw material cost per unit	₹60.00	₹42.00
Direct labour cost per unit	₹30.00	₹18.00
Variable overhead per unit	₹12.00	₹6.00
Fixed overhead per unit	₹8.00	₹4.00
Selling price per unit	₹120.00	₹78.00

After some marketing efforts, the sales quantity of the Product A & B can be increased by 1,500 units and 500 units respectively but for this purpose the variable overhead and fixed overhead will be increased by 10% and 5% respectively for both products.

You are required to prepare flexible budget for both the products:

(a) Before marketing efforts.
(b) After marketing efforts.

Answer

(a) Flexible Budget before Marketing Efforts

Particulars	*Product A (6,000 units)*		*Product B (9,000 units)*	
	Per unit	*Total*	*Per unit*	*Total*
Sales	120.00	7,20,000	78.00	7,02,000
Raw materials cost	60.00	3,60,000	42.00	3,78,000
Direct labour cost	30.00	1,80,000	18.00	1,62,000
Variable overhead	12.00	72,000	6.00	54,000
Fixed overhead	8.00	48,000	4.00	36,000
Total cost	***110.00***	***6,60,000***	***70.00***	***6,30,000***
Profit	***10.00***	***60,000***	***8.00***	***72,000***

(b) Flexible Budget After Marketing Efforts

Particulars	*Product A (7,500 units)*		*Product B (9,500 units)*	
	Per unit	*Total*	*Per unit*	*Total*
Sales	120.00	9,00,000	78.00	7,41,000
Raw materials cost	60.00	4,50,000	42.00	3,99,000
Direct labour cost	30.00	2,25,000	18.00	1,71,000
Variable overhead	13.20	99,000	6.60	62,700
Fixed OH (48,000 + 5%)/(36,000 + 5%)	6.72	50,400	3.98	37,800
Total cost	***109.92***	***8,24,400***	***70.58***	***6,70,500***
Profit	***10.08***	***75,600***	***7.42***	***70,500***

BQ 5

During the FY 2022-23, P Limited has produced 60,000 units operating at 50% capacity level. The cost structure at the 50% level of activity is as under:

Direct Material	₹300 per unit
Direct Wages	₹100 per unit
Variable Overheads	₹100 per unit
Direct Expenses	₹60 per unit
Factory Expenses (25% Fixed)	₹80 per unit
Selling and Distribution Expenses (80% Variable)	₹40 per unit
Office and Administrative Expenses (100% Fixed)	₹20 per unit

The company anticipates that in FY 2023-24, the variable costs will go up by 20% and fixed costs will go up by 15%. The selling price per unit will increase by 10% to ₹880

Required:

(a) Calculate the budgeted profit/loss for the FY 2022-23.

(b) Prepare an Expense budget on marginal cost basis for the FY 2023-24 for the company at 50% and 60% level of activity and find out the profits at respective levels.

Answer

(1) Statement of Budgeted Profit for the FY 2022-23

Particulars	***Per Unit (₹)***	***60,000 units (₹)***
(A) Sales	800.00	4,80,00,000
(B) Variable Cost:		
Direct Material	300	1,80,00,000
Direct Wages	100	60,00,000
Variable Overhead	100	60,00,000
Direct Expenses	60	36,00,000
Variable Factory Expenses (75% of ₹80 p.u.)	60	36,00,000
Variable Selling and Distribution Expenses (80% of ₹40 p.u.)	32	19,20,000
Total (B)	***652***	***3,91,20,000***
(C) Contribution (A - B)	***148***	***88,80,000***
(D) Fixed Cost:		
Office and Administration Expenses (100%)	-	12,00,000
Fixed Factory Expenses (25%)	-	12,00,000
Fixed Selling and Distribution Expenses (20%)	-	4,80,000
Total (D)		***28,80,000***
Net Profit (C - D)	***-***	***60,00,000***

(2) Expense Budget of P Ltd. for the FY 2023-24 at 50% & 60% level

Particulars	***60,000 units***		***72,000 units***	
	Per Unit	***Amount***	***Per Unit***	***Amount***
(A) Sales	880	5,28,00,000	880	6,33,60,000
(B) Variable Cost:				
Direct Material	360	2,16,00,000	360	2,59,20,000
Direct Wages	120	72,00,000	120	86,40,000
Variable Overhead	120	72,00,000	120	86,40,000
Direct Expenses	72	43,20,000	72	51,84,000
Variable Factory Expenses	72	43,20,000	72	51,84,000
Variable Selling and Distribution Expenses	38.40	23,04,000	38.40	27,64,800
Total (B)	***782.40***	***4,69,44,000***	***782.40***	***5,63,32,800***
(C) Contribution (A - B)	***97.60***	***58,56,000***	***97.60***	***70,27,200***

(D) Fixed Cost:				
Office and Administration Expenses (100%)	-	13,80,000	-	13,80,000
Fixed Factory Expenses (25%)	-	13,80,000	-	13,80,000
Fixed Selling and Distribution Expenses (20%)	-	5,52,000	-	5,52,000
Total (D)		***33,12,000***		***33,12,000***
Net Profit (C - D)	***-***	***25,44,000***	***-***	***37,15,200***

BQ 6

ABC Ltd. is currently operating at 75% of its capacity. In the past two years the level of operations was 55% and 65% respectively. Presently, the production is 75,000 units. The company is planning for 85% capacity level during 2022-23. The cost details are as follow:

Particulars	***55%***	***65%***	***75%***
Direct materials	11,00,000	13,00,000	15,00,000
Direct Labour	5,50,000	6,50,000	7,50,000
Factory Overheads	3,10,000	3,30,000	3,50,000
Selling overheads	3,20,000	3,60,000	4,00,000
Administrative Overheads	1,60,000	1,60,000	1,60,000
Total cost	***24,40,000***	***28,00,000***	***31,60,000***

Profit is estimated @ 20% on sales.

The following increases in costs are expected during the year:

Direct materials	8%
Direct Labour	5%
Variable factory overheads	5%
Variable selling overheads	8%
Fixed factory overheads	10%
Fixed selling overheads	15%
Administrative overheads	10%

Prepare a flexible budget for the period 2022-23 at 85% level of capacity and ascertain the profit and contribution.

[Profit ₹9,46,300; Contribution ₹14,57,300; Sales ₹47,31,500]

BQ 7

Action Plan Manufacturers normally produce 8,000 units of their product in a month, in their machine shop. For the month of January, they had planned for a production of 10,000 units. Owing to a sudden cancellation of a contract in the middle of January, they could only produce 6,000 units in January.

Indirect manufacturing costs are carefully planned and monitored in the machine shop and the foreman of the shop is paid a 10% of the savings as bonus when in any month the indirect manufacturing cost incurred is less than the budgeted provision.

The foreman has put in a claim that he should be paid a bonus of ₹88.50 for the month of January. The works manager wonders how anyone can claim a bonus when the Company has lost a sizeable contract. The relevant figures are as under:

Indirect manufacturing costs	***For a normal month 8,000 units***	***Planned for January 10,000 units***	***Actual in January 6,000 units***
Salary of foreman	1,000.00	1,000.00	1,000.00
Indirect Labour	720.00	900.00	600.00
Indirect material	800.00	1,000.00	700.00
Repairs and maintenance	600.00	650.00	600.00

Power	800.00	875.00	740.00
Tools consumed	320.00	400.00	300.00
Rates and taxes	150.00	150.00	150.00
Depreciation	800.00	800.00	800.00
Insurance	100.00	100.00	100.00
Total	***5,290.00***	***5,875.00***	***4,990.00***

Do you agree with the works manager? Is the foreman entitled to any bonus for the performance in January? Substantiate your answer with facts and figures.

[Costs as per flexible budget for 6,000 units are ₹4,705; hence, foreman is not entitled for Bonus.]

PRODUCTION AND RELATED BUDGETS

BQ 8

A single product company estimated its sales for the next year quarter-wise as under:

Quarter	*Sales (in units)*
I	30,000
II	37,500
III	41,250
IV	45,000

The opening stock of finished goods is 6,000 units and the company expects to maintain the closing stock of finished goods at 12,250 units at the end of the year. The production pattern in each quarter is based on 80% of the sales of the current quarter and 20% of the sales of the next quarter.

The opening stock of raw materials in the beginning of the year is 10,000 kg and the closing stock at the end of the year is required to be maintained at 5,000 kg. Each unit of finished output requires 2 kg of raw materials. The value of the opening stock of raw materials in the beginning of the year is ₹20,000.

The company proposes to purchase the entire annual requirement of raw materials in the first three quarters in the proportion and at the prices given below:

Quarter	*Purchase of raw materials (%)*	*Price per kg*
I	30%	₹2
II	50%	₹3
III	20%	₹4

You are required to present the following for the next year, quarter wise:

(i) Production budget in units.
(ii) Raw material consumption budget in quantity.
(iii) Raw material purchase budget in quantity and value.
(iv) Prepare stores ledger on the basis of FIFO method.

[(i) 31,500, 38,250, 42,000, 48,250 (ii) 63,000, 76,500, 84,000, 96,500 (iii) 94,500, 1,57,500, 63,000 and 1,89,000, 4,72,500, 2,52,000]

BQ 9

Jigyasa Ltd. is drawing a production plan for its two products Minimax (MM) and Heavyhigh (HH) for the year 2023-24. The company's policy is to hold closing stock of finished goods at 25% of the anticipated volume of sales of the succeeding month. The following are the estimated data for two products:

	Minimax (MM)	Heavyhigh (HH)
Budgeted production (in units)	1,80,000	1,20,000
Direct material per unit	₹220.00	₹280.00
Direct labour per unit	₹130.00	₹120.00
Manufacturing overheads	₹4,00,000	₹5,00,000

The estimated units to be sold in the first four months of the year 2023-24 are as under:

	April	May	June	July
Minimax (MM)	8,000	10,000	12,000	16,000
Heavyhigh (HH)	6,000	8,000	9,000	14,000

You are required to:

(a) Prepare a production budget for the first quarter in month-wise.
(b) Present production cost budget for first quarter.

Answer

(a) Production Budget of Product Minimax and Heavyhigh (in units)

Particulars	April		May		June		Total	
	MM	HH	MM	HH	MM	HH	MM	HH
Sales	8,000	6,000	10,000	8,000	12,000	9,000	30,000	23,000
Add: Closing Stock (25% of next month's sales)	2,500	2,000	3,000	2,250	4,000	3,500	9,500	7,750
Less: Opening Stock	*2,000	*1,500	2,500	2,000	3,000	2,250	7,500	5,750
Production in units	***8,500***	***6,500***	***10,500***	***8,250***	***13,000***	***10,250***	***32,000***	***25,000***

Note: Opening stock of April is the closing stock of March, which is as per company's policy 25% of next month's sales.

(b) Production Cost Budget

Elements of cost	Minimax (MM)		Heavyhigh (HH)	
	Per unit	Total (₹)	Per unit	Total (₹)
No of units	1	32,000	1	25,000
Direct Material	220	70,40,000	280	70,00,000
Direct Labour	130	41,60,000	120	30,00,000
Manufacturing Overhead:				
MM: (₹4,00,000 ÷ 1,80,000) × 32,000	2.22	71,111	-	-
HH: (₹5,00,000 ÷ 1,20,000) × 25,000	-	-	4.167	1,04,167
Production Cost	***352.22***	***1,12,71,111***	***404.167***	***1,01,04,167***

BQ 10

K Ltd. produces and markets a very popular product called 'X'. The company is interested in presenting its budget for the second quarter of 2023.

The following information are made available for this purpose:

(a) It expects to sell 1,50,000 bags of 'X' during the second quarter of 2023 at the selling price of ₹1,200 per bag.

(b) Each bag of 'X' requires 2.5 mtr. of raw material 'Y' and 7.5 mtr. of raw – material 'Z'.

(c) Stock levels are planned as follows:

Particulars	Beginning of Quarter	End of Quarter
Finished Bags of 'X' (Nos.)	45,000	33,000
Raw – Material 'Y' (mtr)	96,000	78,000
Raw – Material 'Z' (mtr)	1,71,000	1,41,000
Empty Bag (Nos.)	1,11,000	84,000

(d) 'Y' cost ₹160 per mtr., 'Z' costs ₹30 per mtr. and 'Empty Bag' costs ₹110 each.

(e) It requires 9 minutes of direct labour to produce and fill one bag of 'X'. Labour cost is ₹70 per hour.

(f) Variable manufacturing costs are ₹60 per bag. Fixed manufacturing costs ₹40,00,000 per quarter.

(g) Variable selling and administration expenses are 5% of sales and fixed administration and selling expenses are ₹3,75,000 per quarter.

Required

1. Prepare a production budget for the said quarter in quantity.
2. Prepare a raw material purchase budget for 'Y', 'Z' and 'Empty Bags' for the said quarter in quantity as well as in rupees.
3. Compute the budgeted variable cost to produce one bag of 'X'.

Answer

1. Production Budget of 'X' for the Second Quarter

Particulars	Bags (Nos.)
Budgeted Sales	1,50,000
Add: Desired Closing stock	33,000
Total Requirements	1,83,000
Less: Opening stock	(45,000)
Required Production	1,38,000

2. Raw Materials Purchase Budget in Quantity as well as in ₹ for 1,38,000 Bags of 'X'

Particulars	'Y'	'Z'	Empty Bags
Production Requirements Per bag of 'X'	2.5	7.5	1.0
Requirement for Production	3,45,000 (1,38,000 × 2.5)	10,35,000 (1,38,000 × 7.5)	1,38,000 (1,38,000 × 1)
Add: Desired Closing Stock	78,000	1,41,000	84,000
Total Requirements	4,23,000	11,76,000	2,22,000
Less: Opening Stock	(96,000)	(1,71,000)	(1,11,000)
Quantity to be Purchased	***3,27,000***	***10,05,000***	***1,11,000***
Cost per mtr./Bag	₹160	₹30	₹110
Cost of Purchase	***₹5,23,20,000***	***₹3,01,50,000***	***₹1,22,10,000***

3. Computation of Budgeted Variable Cost of Production of 1 Bag of 'X'

Particulars	Amount (₹)
Raw Material:	
Y 2.5 mtr @₹160	400.00
Z 7.5 mtr @₹30	225.00
Empty Bag	110.00
Direct Labour {(₹70 ÷ 60 minutes) × 9 minutes}	10.50
Variable Manufacturing Overheads	60.00
Variable Cost of Production per bag	***805.50***

BQ 11

A light motor vehicle manufacturer has prepared sales budget for the next few months, and the following draft figures are available:

Month	Number of vehicles
October	4,000
November	3,500
December	4,500
January	6,000
February	6,500

To manufacture a vehicle a standard cost of ₹2,85,700 is incurred and sold through dealers at a uniform selling price of ₹3,95,600 to customers. Dealers are paid 12.5% commission on selling price on sale of a vehicle.

Apart from other materials four units of Part X are required to manufacture a vehicle. It is a policy of the company to hold stocks of Part X at the end of the each month to cover 40% of next month's production. 4,800 units of Part X are in stock as on 1st October.

There are 950 numbers of completed vehicles in stock as on 1st October and it is the policy to have stock at the end of each month to cover 20% of the next month's sales.

You are required to:

(a) Prepare Production budget (in numbers) for the month of October, November, December and January.
(b) Prepare Purchase budget for Part X (in units) for the month of October, November and December.
(c) Calculate the budgeted Gross profit for the quarter October to December.

Answer

(a) Production Budget (in numbers)

Particulars	October	November	December	January
Demand for the month (in nos.)	4,000	3,500	4,500	6,000
Add: Closing Stock (20% of the next month's demand)	700	900	1,200	1,300
Less: Opening Stock	(950)	(700)	(900)	(1,200)
Vehicles to be produced	**3,750**	**3,700**	**4,800**	**6,100**

(b) Purchase Budget for Part X (in units)

Particulars	October	November	December
Production for the month (in numbers)	3,750	3,700	4,800
No of units of Part X required for production of current month (4 units for 1 units of vehicle)	15,000	14,800	19,200
Add: Closing Stock of Part X (To cover 40% of the next month's production)	5,920 (40% × 14,800)	7,680 (40% × 19,200)	9,760 (40%×4×6,100)
Less: Opening Stock	(4,800)	(5,920)	(7,680)
Part X to be purchased	**16,120**	**16,560**	**21,280**

(c) Budgeted Gross Profit for the Quarter October to December

Particulars	October	November	December	Total
Sales in numbers	4,000	3,500	4,500	12,000
Sales value @ ₹3,46,150 per unit (in Lakh)	13,846	12,115.25	15,576.75	41,538
Less: Cost @ ₹2,85,700 per unit (in Lakh)	11,428	9,999.50	12,856.50	34,284
Gross Profit (in Lakh)	**2,418**	**2,115.75**	**2,720.25**	**7,254**

Note: Net selling price per unit (₹3,95,600 – 12.5% commission = ₹3,46,150) is used to prepare the gross profit budget.

SALES BUDGET

BQ 12

B Ltd manufactures two products viz., X and Y and sells them through two divisions, East and West. For the purpose of Sales Budget to the Budget Committee, following information has been made available for the year 2022-23:

Product	Budgeted Sales		Actual Sales	
	East Division	West Division	East Division	West Division
X	800 units at ₹18	1,200 units at ₹18	1,000 units at ₹18	1,400 units at ₹18
Y	600 units at ₹42	1,000 units at ₹42	400 units at ₹42	800 units at ₹42

Adequate market studies reveal that product X is popular but underpriced. It is expected that if the price of X is increased by ₹2, it will find a ready market. On the other hand, Y is overpriced and if the price of Y is reduced by ₹2, it will have more demand in the market. The company management has agreed for the aforesaid price changes. On the basis of these price changes and the reports of salesmen, following estimates have been prepared by the Divisional Managers:

Percentage increase in sales over budgeted sales:

Product	East Division	West Division
X	+ 12.5%	+ 7.5%
Y	+ 22.5%	+ 12.5%

With the help of the intensive advertisement campaign, following additional sales (over and above the above mentioned estimated sales by Divisional Managers) are possible:

Product	East Division	West Division
X	120 units	140 units
Y	80 units	100 units

You are required to prepare Sales Budget 2023 – 2024 after incorporating above estimates and also show the Budgeted Sales and Actual Sales of 2022 – 2023.

Answer

1. Statement Showing Sales Budget for 2023-24

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amount (₹)	Qty.	Rate (₹)	Amount (₹)	Amount (₹)
East	1,020	20	20,400	815	40	32,600	53,000
West	1,430	20	28,600	1,225	40	49,000	77,600
Total	**2,450**	**-**	**49,000**	**2,040**	**-**	**81,600**	**1,30,600**

Working notes:

Calculation of budgeted sales of product X for 2023 -24 in units:

East division	=	(800 units + 12.5%) + 120 units	=	1,020 units
West division	=	(1,200 units + 7.5%) + 140 units	=	1,430 units

Calculation of budgeted sales of product Y for 2022 -23 in units:

East division	=	(600 units + 22.5%) + 80 units	=	815 units
West division	=	(1,000 units + 12.5%) + 100 units	=	1,225 units

2. Statement Showing Sales Budget for 2022 – 23

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amount (₹)	Qty.	Rate (₹)	Amount (₹)	Amount (₹)
East	800	18	14,400	600	42	25,200	39,600
West	1,200	18	21,600	1,000	42	42,000	63,600
Total	**2,000**	**-**	**36,000**	**1,600**	**-**	**67,200**	**1,03,200**

3. Statement Showing Actual Sales for 2022 – 23

Division	Product X			Product Y			Total
	Qty.	Rate (₹)	Amount (₹)	Qty.	Rate (₹)	Amount (₹)	Amount (₹)
East	1,000	18	18,000	400	42	16,800	34,800
West	1,400	18	25,200	800	42	33,600	58,800
Total	**2,400**	**-**	**43,200**	**1,200**	**-**	**50,400**	**93,600**

MASTER BUDGET

BQ 13

Float Glass manufacturing company requires you to present the Master budget for the next year from the following information:

Sales:

Toughened Glass	₹6,00,000
Bent Glass	₹2,00,000

Cost:

Direct materials cost	60% of sales
Direct wages	20 workers @ ₹150 per month
Factory overheads:	
Indirect labour:	
Works manager	₹500 per month
Foreman	₹400 per month
Stores and spares	2.5% of sales
Depreciation on machine	₹12,600
Light and power	₹3,000
Repairs and maintenance	₹8,000
Other sundries	10% of direct wages
Administration, selling and distribution expenses	₹36,000 per year

Answer

Master Budget

Particulars	₹	₹	₹
Sales:			
Toughened Glass			6,00,000
Bent Glass			2,00,000
Total Sales			**8,00,000**
Less: Cost of production:			

Direct materials (60% of ₹8,00,000)		4,80,000	
Direct wages (20 workers × ₹150 × 12 months)		36,000	
Prime Cost		***5,16,000***	
Fixed Factory Overheads:			
Works manager's salary (₹500 × 12 months)	6,000		
Foreman's salary (₹400 × 12 months)	4,800		
Depreciation	12,600		
Light and power (assumed fixed)	3,000	26,400	
Variable Factory Overheads:			
Stores and spares (2.5% of ₹8,00,000)	20,000		
Repairs and maintenance (assumed variable)	8,000		
Sundry expenses (10% of ₹36,000)	3,600	31,600	
Works Cost			***5,74,000***
Gross Profit (Sales – Works cost)			***2,26,000***
Less: Administration, selling and distribution OH			36,000
Net Profit			***1,90,000***

MISCELLANEOUS

BQ 14

The accountant of manufacturing company provides you the following details for the year 2022:

Direct materials	₹1,75,000	Other variable costs	₹80,000
Direct wages	₹1,00,000	Other fixed costs	₹80,000
Fixed factory overheads	₹1,00,000	Profit	₹1,15,000
Variable factory overheads	₹1,00,000	Sales	₹7,50,000

During the year, the company manufactured two products A and B and the output and costs were:

	A	*B*
Output (units)	2,00,000	1,00,000
Selling price per unit	₹2.00	₹3.50
Direct materials per unit	₹0.50	₹0.75
Direct wages per unit	₹0.25	₹0.50

Variable factory overhead are absorbed as a percentage of direct wages. Other variable costs have been computed as: Product A ₹0.25 per unit; and B ₹0.30 per unit.

During 2023, it is expected that the demand of product A will fall by 25% and for B by 50%. It is decided to manufacture a further product C, the cost for which are estimated as follows:

	C
Output (units)	2,00,000
Selling price per unit	₹1.75
Direct materials per unit	₹0.40
Direct wages per unit	₹0.25

It is anticipated that the other variable cost per unit will be the same as for product A.

Prepare a budget to present to the management, showing the current position and the position for 2023. Comment on the comparative results.

Answer

Budget Showing Current Position and Position for 2023

Particulars	Position for 2022			Position for 2023			
	A	B	Total	A	B	C	Total
Sales (Units)	2,00,000	1,00,000	3,00,000	1,50,000	50,000	2,00,000	4,00,000
Sales (in ₹)	4,00,000	3,50,000	7,50,000	3,00,000	1,75,000	3,50,000	8,25,000
Direct materials	1,00,000	75,000	1,75,000	75,000	37,500	80,000	1,92,500
Direct wages	50,000	50,000	1,00,000	37,500	25,000	50,000	1,12,500
Factory OH (V)	50,000	50,000	1,00,000	37,500	25,000	50,000	1,12,500
Other cost (V)	50,000	30,000	80,000	37,500	15,000	50,000	1,02,500
Marginal Cost	***2,50,000***	***2,05,000***	***4,55,000***	***1,87,500***	***1,02,500***	***2,30,000***	***5,20,000***
Contribution	***1,50,000***	***1,45,000***	***2,95,000***	***1,12,500***	***72,500***	***1,20,000***	***3,05,000***
Less: Fixed cost							
Factory			1,00,000				1,00,000
Other			80,000				80,000
Profit			***1,15,000***				***1,25,000***

Comment: Introduction of Product C is likely to increase profit by 10,000 (i.e. from 1,15,000 to 1,25,000) in 2023 as compared to 2022. Therefore, introduction of product C is recommended.

BQ 15

Concorde Ltd. manufactures two products using two types of materials and one grade of labour. Shown below is an extract from the company's working papers for the next month's budget:

	Product A	***Product B***
Budgeted sales (in units)	2,400	3,600
Budgeted material consumption per unit (in kg):		
Material X	5	3
Material Y	4	6
Standard labour hours allowed per unit of product	3	5

Material X and Material Y cost ₹4 and ₹6 per kg and labours are paid 25 per hour. Overtime premium is 50% and is payable, if a worker works for more than 40 hours a week. There are 180 direct workers.

The target productivity ratio (or efficiency ratio) for the productive hours worked by the direct workers in actually manufacturing the products is 80%. In addition the non-productive down-time is budgeted at 20% of the productive hours worked.

There are four 5-days weeks in the budgeted period and it is anticipated that sales and production will occur evenly throughout the whole period.

It is anticipated that stock at the beginning of the period will be:

Product A	400 units
Product B	200 units
Material X	1,000 kg
Material Y	500 kg

The anticipated closing stocks for the budgeted period are as below:

Product A	4 days sales
Product B	5 days sales
Material X	10 days consumption
Material Y	6 days consumption

Calculate the Materials Purchase Budget and Wages Budget for the direct workers, showing the quantities and values, for the month.

Answer

(i) Material Purchase Budget

Particulars	Material X	Material Y
Materials consumed:		
Product A @ 5 kg/4 kg per unit of 2,480 units	12,400	9,920
Product B @ 3 kg/6 kg per unit of 4,300 units	12,900	25,800
Total consumption (in kg)	25,300	35,720
Add: Closing Stock:		
Materials X ($^{25,300}/_{20\ days}$ × 10 days)	12,650	-
Materials Y ($^{35,720}/_{20\ days}$ × 6 days)	-	10,716
Less: Opening Stock of Raw Material	(1,000)	(500)
Quantity of materials to be purchased (in kg)	**36,950**	**45,936**
Rate per kg	₹4	₹6
Material Purchase (in ₹)	**₹1,47,800**	**₹2,75,616**

(ii) Wages Budget

Particulars	Product A	Product B
Units to be produced	2,480	4,300
Standard hours allowed per unit	3	5
Total standard hours allowed	7,440	21,500
Productive hours required for production (80% efficiency)		
Product A (7,440 ÷ 80%)	9,300	-
Product A (21,500 ÷ 80%)	-	26,875
Add: Non-productive down time @ 20% of productive hours	1,860	5,375
Total hours to be paid	**11,160**	**32,250**
Total hours to be paid (11,160 + 32,250)		43,410
Normal hours (4 weeks × 40 hours × 180 workers)		28,800
Overtime hours (43,410 – 28,800)		14,610
Wages to be paid:		
Normal hours @ ₹25 per hour for 28,800 hours		₹7,20,000
Overtime hours @ ₹37.50 (25 + 50%) per hour for 14,610 hours		₹5,47,875
Total Wages paid (in ₹)		**₹12,67,875**

Working notes:

(1) Number of days in budget period = 4 weeks × 5 days = 20 days

(2) Calculation of number of units to be produced:

Particulars	Product A	Product B
Units to be sold	2,400	3,600
Add: Closing Stock:		
Product A ($^{2,400}/_{20\ days}$ × 4 days)	480	-
Product B ($^{3,600}/_{20\ days}$ × 5 days)	-	900
Less: Opening Stock	(400)	(200)
Units to be produced	**2,480**	**4,300**

BQ 16

A company is engaged in the manufacture of specialised sub-assemblies required for certain electronic equipment. The company envisages that in the forthcoming month, December, the sales will take a pattern in the ratio of 3 : 4 : 2 respectively of sub-assemblies, ACB, MCB and DP.

The following is the schedule of components required for manufacture:

Sub-assembly	Selling Price (₹)	Component Requirements			
		Base Board	IC08	IC12	IC26
ACB	520	1	8	4	2
MCB	500	1	2	10	6
DP	350	1	2	4	8
Purchase Price (₹)	-	60	20	12	8

The direct labour time and variable overheads required for each of the sub-assemblies are:

Particulars	Labour hours		Variable overheads
	Grade A	Grade B	
ACB	8	16	36
MCB	6	12	24
DP	4	8	24
Direct wage rate per hour (₹)	5	4	-

The labourers work 8 hours a day for 25 days a month.

The opening stocks of sub-assemblies and components for December are as under:

ACB	MCB	DP	Base Board	IC08	IC12	IC26
800	1,200	2,800	1,600	1,200	6,000	4,000

Fixed overheads amount to ₹7,57,200 for the month and a monthly profit target of ₹12,00,000 has been set. The company is eager for a reduction of *closing inventories for December of sub-assemblies and components by 10% of quantity as compared to the opening stock.

Prepare the following budgets for December:

(a) Sales budget in quantity and value.
(b) Production budget in quantity
(c) Component usage budget in quantity.
(d) Component purchase budget in quantity and value.
(e) Manpower budget showing the number of workers and the amount of wages payable.

Answer

(a) Sales Budget in Quantity and Value

Particulars	ACB	MCB	DP	Total
Sales in quantity in 3 : 4 : 2	6,300	8,400	4,200	18,900
Selling price per unit (₹)	520	500	350	-
Sales value (₹)	32,76,000	42,00,000	14,70,000	89,46,000

(b) Production Budget in Quantity

Particulars	ACB	MCB	DP
Sales in units	6,300	8,400	4,200
Add: Closing stock (10% less than opening stock)	720	1,080	2,520
Less: Opening stock	(800)	(1,200)	(2,800)
Production in units	***6,220***	***8,280***	***3,920***

(c) Component Usage Budget in Quantity

Particulars	ACB	MCB	DP	Total
Production in quantity	6,220	8,280	3,920	-
Base board (1 each)	6,220	8,280	3,920	18,420

IC08 (8, 2 and 2 per unit)	49,760	16,560	7,840	74,160
IC12 (4, 10 and 4 per unit)	24,880	82,800	15,680	1,23,360
IC26 (2, 6 and 8 per unit)	12,440	49,680	31,360	93,480

(d) Component Purchase Budget in Quantity and Value

Particulars	Base Board	IC08	IC12	IC26	Total
Usage in production	18,420	74,160	1,23,360	93,480	-
Add: Closing stock (10% less than opening)	1,440	1,080	5,400	3,600	-
Less: Opening stock	(1,600)	(1,200)	(6,000)	(4,000)	-
Purchase in quantity	18,260	74,040	1,22,760	93,080	3,08,140
Purchase price per unit (₹)	60	20	12	8	-
Purchase value (₹)	10,95,600	14,80,800	14,73,120	7,44,640	47,94,160

(e) Manpower Budget Showing the Number of Workers and the Amount of Wages Payable

Particulars	Budgeted Production	Grade A		Grade B		Total
		Hours Per Unit	Total Hours	Hours Per Unit	Total Hours	
ACB	6,220	8	49,760	16	99,520	
MCB	8,280	6	49,680	12	99,360	
DP	3,920	4	15,680	8	31,360	
(A) Total hours			1,15,120		2,30,240	
(B) Hours per man per month (8 hours × 25 days)			200		200	
(C) Number of workers per month (A ÷ B)			576		1,152	1,728
(D) Wage rate per month (200 hours × ₹5/₹4)			1,000		800	
(E) Wages payable (C × D)			5,76,000		9,21,600	14,97,600

Working notes:

1. Desired contribution = Fixed cost + Profit = 7,57,200 + 12,00,000 = 19,57,200

2. Calculation of contribution per unit:

Particulars	ACB (₹)	MCB (₹)	DP (₹)
Selling price per unit	**520**	**500**	**350**
Variable cost per unit:			
Components:			
Base board	(1 × 60) = 60	(1 × 60) = 60	(1 × 60) = 60
IC08	(8 × 20) = 160	(2 × 20) = 40	(2 × 20) = 40
IC12	(4 × 12) = 48	(10 × 12) = 120	(4 × 12) = 48
IC26	(2 × 8) = 16	(6 × 8) = 48	(8 × 8) = 64
Labour:			
Grade A	(8 × 5) = 40	(6 × 5) = 30	(4 × 5) = 20
Grade B	(16 × 4) = 64	(12 × 4) = 48	(8 × 4) = 32
Variable production overheads	36	24	24
Total Variable Cost per unit	**424**	**370**	**288**
Contribution per unit	**96**	**130**	**62**

3. Number of units required = Desired contribution ÷ Composite contribution per unit
= 19,57,200 ÷ 103.555 = 18,900 units
Units of ACB = 18,900 × 3/9 = 6,300 units
Units of MCB = 18,900 × 4/9 = 8,400 units
Units of DP = 18,900 × 2/9 = 4,200 units

4. Composite contribution p.u. = (96 × 3 + 130 × 4 + 62 × 2) ÷ 9 = 103.555 p.u.

PAST YEAR QUESTIONS

PYQ 1

RST Limited is presently operating at 50% capacity and producing 30,000 units. The entire output is sold at a price of ₹200 per unit. The cost structure at 50% level of activity is as under:

Direct Material	₹75 per unit
Direct Wages	₹25 per unit
Variable Overheads	₹25 per unit
Direct Expenses	₹15 per unit
Factory Expenses (25% Fixed)	₹20 per unit
Selling and Distribution Expenses (80% Variable)	₹10 per unit
Office and Administrative Expenses (100% Fixed)	₹5 per unit

The company anticipates that the variable costs will go up by 10% and fixed costs will go up by 15%.

You are required to prepare an Expense Budget, on the basis of marginal cost for the company at 50% and 60% level of activity and find out the profit at respective levels.

[(8 Marks) Nov 2014]

Answer

Expenses Budget of RST Ltd

Particulars	Per Unit (₹)	30,000 units (₹)	36,000 units (₹)
(A) Sales	200.00	60,00,000	72,00,000
(B) Variable Cost:			
Direct Material (₹75 + 10%)	82.50	24,75,000	29,70,000
Direct Wages (₹25 + 10%)	27.50	8,25,000	9,90,000
Variable Overhead (₹25 + 10%)	27.50	8,25,000	9,90,000
Direct Expenses (₹15 + 10%)	16.50	4,95,000	5,94,000
Variable Factory Expenses (₹20 × 75% + 10%)	16.50	4,95,000	5,94,000
Variable Selling and Distribution Expenses (₹10 × 80% + 10%)	8.80	2,64,000	3,16,800
Total (B)	**179.30**	**53,79,000**	**64,54,800**
(C) Contribution (A - B)	**20.70**	**6,21,000**	**7,45,200**
(D) Fixed Cost:			
Office and Administration Expenses (₹5 × 100% × 30,000 units + 15%)	-	1,72,500	1,72,500
Factory Expenses (₹20 × 25% × 30,000 units + 15%)	-	1,72,500	1,72,500
Selling and Distribution Expenses (₹10 × 20% × 30,000 units + 15%)	-	69,000	69,000
Total (D)	**-**	**4,14,000**	**4,14,000**
Net Profit (C - D)	**-**	**2,07,000**	**3,31,200**

PYQ 2

XYZ company is drawing a production plan for its two products XML and YML for the year 2015-16. The company's policy is to maintain a closing stock of finished goods at 25% of the anticipated volume of the sales of the succeeding month.

The following are the estimated data for two products:

	XML	YML

Budgeted production in units	2,00,000	1,50,000
Direct material per unit	₹220.00	₹280.00
Direct labour per unit	₹130.00	₹120.00
Other manufacturing expenses	₹4,00,000	₹5,00,000

The estimated units to be sold in the first 4 months of the year 2015-16 are as under:

	April	*May*	*June*	*July*
XML	8,000	10,000	12,000	16,000
YML	6,000	8,000	9,000	14,000

Prepare:

(i) Production Budget (Month wise)

(ii) Production Cost Budget (for first quarter of the year)

[(5 Marks) May 2015]

Answer

(i) Production Budget

Product XML			
Particulars	***April***	***May***	***June***
Budgeted Sales (in units)	8,000	10,000	12,000
Add: Expected Closing Stock (25% of sales of next month)	2,500	3,000	4,000
Less: Opening Stock	(2,000)	(2,500)	(3,000)
Total Production	***8,500***	***10,500***	***13,000***
Product YML			
Particulars	***April***	***May***	***June***
Budgeted Sales (in units)	6,000	8,000	9,000
Add: Expected Closing Stock (25% of sales of next month)	2,000	2,250	3,500
Less: Opening Stock	(1,500)	(2,000)	(2,250)
Total Production	***6,500***	***8,250***	***10,250***

(ii) Production Cost Budget

Particulars	***XML***	***YML***
No of units expected to be produced during first quarter	32,000	25,000
Direct material @ ₹220/ ₹280 per unit	70,40,000	70,00,000
Direct labour @ ₹130/ ₹120 per unit	41,60,000	30,00,000
Other manufacturing expenses @ ₹2 / ₹3.33 per unit	64,000	83,333
Total Production Cost	***1,12,64,000***	***1,00,83,333***

Note: Other manufacturing expenses are apportioned on the basis of no of units, one student may apportion these expenses on the basis of period i.e. ₹1,00,000 for quarter first in case of XML.

PYQ 3

XY Co. Ltd manufactures two products viz. X and Y and sells them through two divisions, East and West. For the purpose of Sales budget to the Budget Committee, following information has been made available for the year 2014 – 2015:

Product	***Budgeted Sales***		***Actual Sales***	
	East Division	***West Division***	***East Division***	***West Division***
X	400 units at ₹9	600 units at ₹9	500 units at ₹9	700 units at ₹9
Y	300 units at ₹21	500 units at ₹21	200 units at ₹21	400 units at ₹21

Adequate market studies reveal that product X is popular but under priced. It is expected that if the price of

X is increased by ₹1, it will find a ready market. On the other hand, Y is overpriced and if the price of Y is reduced by ₹1, it will have more demand in the market. The company management has agreed for the aforesaid price changes. On the basis of these price changes and the reports of salesmen, following estimates have been prepared by the Divisional Managers:

Percentage increase in sales over budgeted sales:

Product	*East Division*	*West Division*
X	+ 10%	+ 5%
Y	+ 20%	+ 10%

With the help of the intensive advertisement campaign, following additional sales (over and above the above mentioned estimated sales by Divisional Managers) are possible:

Product	*East Division*	*West Division*
X	60 units	70 units
Y	40 units	50 units

You are required to prepare Sales Budget 2015 – 2016 after incorporating above estimates and also show the Budgeted Sales and Actual Sales of 2014 – 2015.

[(8 Marks) Nov 2015]

Answer

1. Statement Showing Sales Budget for 2015-16

Division	*Product X*			*Product Y*			*Total*
	Qty.	*Rate (₹)*	*Amount (₹)*	*Qty.*	*Rate (₹)*	*Amount (₹)*	*Amount (₹)*
East	500	10	5,000	400	20	8,000	13,000
West	700	10	7,000	600	20	12,000	19,000
Total	*1,200*	*-*	*12,000*	*1,000*	*-*	*20,000*	*32,000*

2. Statement Showing Sales Budget for 2014-15

Division	*Product X*			*Product Y*			*Total*
	Qty.	*Rate (₹)*	*Amount (₹)*	*Qty.*	*Rate (₹)*	*Amount (₹)*	*Amount (₹)*
East	400	9	3,600	300	21	6,300	9,900
West	600	9	5,400	500	21	10,500	15,900
Total	*1,000*	*-*	*9,000*	*800*	*-*	*16,800*	*25,800*

3. Statement Showing Actual Sales for 2014-15

Division	*Product X*			*Product Y*			*Total*
	Qty.	*Rate (₹)*	*Amount (₹)*	*Qty.*	*Rate (₹)*	*Amount (₹)*	*Amount (₹)*
East	500	9	4,500	200	21	4,200	8,700
West	700	9	6,300	400	21	8,400	14,700
Total	*1,200*	*-*	*10,800*	*600*	*-*	*12,600*	*23,400*

Working notes:

Calculation of budgeted sales of product X for 15 -16 in units

East division	=	(400 units + 10%) + 60 units	=	500 units
West division	=	(600 units + 5%) + 70 units	=	700 units

Calculation of budgeted sales of product Y for 15 -16 in units

East division	=	(300 units + 20%) + 40 units	=	400 units
West division	=	(500 units + 10%) + 50 units	=	600 units

PYQ 4

You are given the following data of a manufacturing concern:

Variable expenses (at 50% capacity)	
Materials	48,00,000
Labour	51,20,000
Others	7,60,000
Semi variable expenses (at 50% capacity)	
Maintenance and repairs	5,00,000
Indirect labour	19,80,000
Sales department salaries	5,80,000
Sundry administrative expenses	5,20,000
Fixed expenses	
Wages and salaries	16,80,000
Rent, rates and taxes	11,20,000
Depreciation	14,00,000
Sundry administrative expenses	17,80,000

The fixed expenses remain constant for all levels of production. Semi variable expenses remain constant between 45% and 65% of capacity whereas it increases by 10% between 65% and 80% capacity of 20% between 80% and 100 % capacity.

Sales at various levels are as under:

At 75% capacity	₹2,40,00,000
At 100% capacity	₹3,20,00,000

You are required to prepare flexible budget at 75% and 100% capacity.

[(8 Marks) May 2017]

Answer

Flexible Budget

Particulars	***Capacity Levels***		
	50% (₹)	***75% (₹)***	***100% (₹)***
(A) Sales	-	2,40,00,000	3,20,00,000
(B) Variable Expenses:			
Material	48,00,000	72,00,000	96,00,000
Labour	51,20,000	76,80,000	1,02,40,000
Others	7,60,000	11,40,000	15,20,000
Total (B)	***1,06,80,000***	***1,60,20,000***	***2,13,60,000***
(C) Semi Variable Expenses			
Maintenance and repairs	5,00,000	5,50,000	6,00,000
Indirect labour	19,80,000	21,78,000	23,76,000
Sales department salaries	5,80,000	6,38,000	6,96,000
Sundry administrative expenses	5,20,000	5,72,000	6,24,000
Total (C)	***35,80,000***	***39,38,000***	***42,96,000***
(D) Fixed Cost:			
Wages and salaries	16,80,000	16,80,000	16,80,000
Rent, rates and taxes	11,20,000	11,20,000	11,20,000
Depreciation	14,00,000	14,00,000	14,00,000
Sundry administrative expenses	17,80,000	17,80,000	17,80,000

Total (D)	***59,80,000***	***59,80,000***	***59,80,000***
Total Cost (B + C + D)	***2,02,40,000***	***2,59,38,000***	***3,16,36,000***
Net Profit (A - D)	***-***	***(19,38,000)***	***3,64,000***

PYQ 5

AB manufacturing company manufactures two products A and B. both products use a common raw materials 'C'. The raw material 'C' is purchased at the rate of ₹45 per kg. from the market. The company has made estimates for the year ended 31st March, 2018 (the budgeted period) as under:

	Product A	***Product B***
Sales in units	36,000	16,700
Finished goods stock increased by year end in units	860	400
Post-production rejection rate (%)	3	5
Material 'C' per computed unit, net of wastage	4 kg	5 kg
Material 'C' wastage in %	5	4

Additional information available is as under:

- Usage of raw material 'C' is expected to be at constant rate over the period.
- Annual cost of holding one unit of raw material "C" in stock is 9% of the material cost.
- The cost of placing an order is 250 per order.

You are required to:

(a) Prepare functional budgets for the year ended 31st March, 2018 under the following categories:
- ***i.*** Production budget for product A and B in units.
- ***ii.*** Purchase budget for raw material 'C' in kg and value.

(b) Calculate economic order quantity (EOQ) in kg for raw material 'C'.

[(8 Marks) Nov 2018]

Answer

(a) (i) Production Budget for the year (in Quantity)

Particulars (in units)	***Product A***	***Product B***
Sales (in units)	36,000	16,700
Add: Increase in Closing Stock	860	400
Budgeted Production after rejection	***36,860***	***17,100***
Add: Post rejection @ 3%/5%	1,140 [(36,860÷97%) × 3%]	900 [(36,860÷95%) × 5%]
Budgeted Production before rejection	***38,000***	***18,000***

(a) (ii) Raw Material Purchase 'C'

Particulars	***Product A***	***Product B***
Budgeted Production in units	38,000	18,000
Raw Material Consumption for one unit	4 kg	5 kg
Materials to be Purchased net of wastage	***1,52,000***	***90,000***
Add: Wastage @ 5%/4%	8,000 [(1,52,000÷95%) × 5%]	3,750 [(90,000÷96%) × 4%]
Materials to be Purchased	***1,60,000***	***93,750***
Materials to be Purchased in kg (1,60,000 + 93,750)		***2,53,750***
Materials to be Purchased in value @ ₹45 of 2,53,750		***₹1,14,18,750***

(b) Economic order quantity = $\sqrt{\frac{2AO}{C}}$ = $\sqrt{\frac{2\times 2,53,750\times 250}{45\times 9\%}}$ = **5,597 kgs**

PYQ 6

An electronic gadget manufacture was prepared sales budget for the next few months. In this respect, following figures are available:

Month	:	January	February	March	April	May
Sales (units)	:	5,000	6,000	7,000	7,500	8,000

To manufacture an electronic gadget, a standard cost of ₹1,500 is incurred and it is sold through dealers at an uniform price ₹2,000 per gadget to customers. Dealers are given a discount of 15% on selling.

Apart from other materials, two units of batteries are required to manufacture a gadget. The company wants to hold stock of batteries at the end of each month to cover 30% of next month's production and to hold stock of manufactured gadget to cover 25% of the next month's sale.

3,250 units of batteries and 1,200 units of manufactured gadgets were in stock on 1st January.

Required:

(1) Prepare production budget (in units) for the month of January, February, March and April.

(2) Prepare purchase budget for batteries (in units) for the month of January, February and March and calculate profit for the quarter ending on March.

[(10 Marks) Nov 2018]

Answer

(a) Production Budget in Units

Particulars	January	February	March	April
Budgeted Sales (in units)	5,000	6,000	7,000	7,500
Add: Desired Closing Stock (25% of sales of next month)	1,500	1,750	1,875	2,000
Less: Opening Stock	(1,200)	(1,500)	(1,750)	(1,875)
Budgeted Production (in Gadget)	**5,300**	**6,250**	**7,125**	**7,625**

(b) Raw Material Purchase Budget in Batteries

Particulars	January	February	March	April
Consumption of batteries @ unit per gadget	10,600 (5,300 × 2)	12,500 (6,250 × 2)	14,250 (7,125 × 2)	15,250 (7,625 × 2)
Add: Desired Closing Stock (30% of consumption of next month)	3,750	4,275	4,575	-
Less: Opening Stock	(3,250)	(3,750)	(4,275)	-
Budgeted Purchase (in Batteries)	**11,100**	**13,025**	**14,550**	**-**

Statement Showing Profit

Particulars	January	February	March	Total
Number of units sold	5,000	6,000	7,000	18,000
Sales @ ₹2,000 per Gadget	1,00,00,000	1,20,00,000	1,40,00,000	3,60,00,000
Less: Discount @ 15% of sales	(15,00,000)	(18,00,000)	(21,00,000)	(54,00,000)
Less: Standard cost @ ₹1,500 per Gadget	(75,00,000)	(90,00,000)	(1,05,00,000)	(2,70,00,000)
Profit	**10,00,000**	**12,00,000**	**14,00,000**	**36,00,000**

PYQ 7

PJ Ltd manufactures hockey sticks. It sells the products at ₹500 each and makes a profit of ₹125 on each stick. The company is producing 5,000 sticks annually by using 50% of its machinery capacity.

The cost of each stick is as under:

Direct Material	₹150
Direct Wages	₹50
Works Overheads	₹125 (50% fixed)
Selling Expenses	₹50 (25% variable)

The anticipation for the next year is that cost will go up as under:

Fixed Charges	10%
Direct Wages	20%
Direct Material	5%

There will not be any change in selling price. There is an additional order for 2,000 sticks in the next year.

Calculate the lowest price that can be quoted so that the company can earn the same profit as it earned in the current year?

[(10 Marks) Nov 2019]

Answer

Statement Showing Lowest Sale Price

Particulars		***Amount (₹)***
Direct Material	(7,000 units × ₹150 × 105%)	11,02,500
Direct Wages	(7,000 units × ₹50 × 120%)	4,20,000
Works Overheads:		
Variable	(7,000 units × ₹125 × 50%)	4,37,500
Fixed	(5,000 units × ₹125 × 50% × 110%)	3,43,750
Selling Expenses:		
Variable	(7,000 units × ₹50 × 25%)	87,500
Fixed	(5,000 units × ₹50 × 75% × 110%)	2,06,250
Total Cost		***25,97,500***
Add: Target Profit	(5,000 units × ₹125)	6,25,000
Total Sales Value		***32,22,500***
Less: Sale Value of 5,000 units	(5,000 units × ₹500)	(25,00,000)
Sales Value of 2,000 units of additional offer		***7,22,500***
÷ Number of units		÷2,000
Lowest Sale Price		***₹361.25***

PYQ 8

G Ltd. manufacturers a single product for which market demand exist for an additional quantity. Present sales are of ₹6,00,000 utilises only 60% capacity of the plant.

The following data are available:

(1)	Selling price	₹100 per unit
(2)	Variable cost	₹30 per unit
(3)	Semi variable cost	₹60,000 fixed + ₹5 per unit
(4)	Fixed cost	₹1,00,000 at present level, estimated to increase by 25% at and above 80% capacity.

You are required to prepare a flexible budget so as to arrive at the operating profit at 60%, 80% and 100% levels.

[(5 Marks) Nov 2020]

Answer

Flexible Budget

Particulars	***60%***	***80%***	***100%***
Sales units	***6,000***	***8,000***	***10,000***
Sales @ ₹100 per unit	***6,00,000***	***8,00,000***	***10,00,000***
Variable Cost @ ₹30 per unit	1,80,000	2,40,000	3,00,000
Semi Variable Cost:			
Variable @ ₹5 per unit	30,000	40,000	50,000
Fixed	60,000	60,000	60,000
Fixed Cost	1,00,000	1,25,000	1,25,000
Total Cost	***3,70,000***	***4,65,000***	***5,35,000***
Operating Profit (Sales – Total Cost)	***2,30,000***	***3,35,000***	***4,65,000***

PYQ 9

PSV Ltd. manufactures and sells a single product and estimated the following related information for the period November, 2020 to March, 2021.

Particulars	***Nov, 2020***	***Dec, 2020***	***Jan, 2021***	***Feb, 2021***	***March, 2021***
Op. stock of FG (in units)	7,500	3,000	9,000	8,000	6,000
Sales (in units)	30,000	35,000	38,000	25,000	40,000
Selling price per unit (in ₹)	10	12	15	15	20

Additional information:

- Closing stock of finished goods at the end of March, 2021 is 10,000 units.
- Each unit of finished output requires 2 kg of Raw Material 'A' and 3 kg of Raw Material 'B'.

You are required to prepare the following budgets for the period November, 2020 to March, 2021 on monthly basis:

(1) Sales Budget (in ₹)
(2) Production budget (in units) and
(3) Raw material budget for raw material 'A' and 'B' separately (in units).

[(10 Marks) July 2021]

Answer

(1) Sales Budget (in ₹)

Particulars	***Nov.***	***Dec.***	***Jan.***	***Feb.***	***March***
Sales (in units)	30,000	35,000	38,000	25,000	40,000
Selling price per unit (in ₹)	10	12	15	15	20
Sales Value (in ₹)	***3,00,000***	***4,20,000***	***5,70,000***	***3,75,000***	***8,00,000***

(2) Production Budget (in units)

Particulars	***Nov.***	***Dec.***	***Jan.***	***Feb.***	***March***
Sales	30,000	35,000	38,000	25,000	40,000
Add: Closing Finished Goods	3,000	9,000	8,000	6,000	10,000
Less: Opening Finished Goods	(7,500)	(3,000)	(9,000)	(8,000)	(6,000)
Production Budget (in units)	***25,500***	***41,000***	***37,000***	***23,000***	***44,000***

(3) Raw Material 'A' Budget (in units)

Particulars	Nov.	Dec.	Jan.	Feb.	March
Units Produced	25,500	41,000	37,000	23,000	44,000
Raw material for 1 unit in Kg	2	2	2	2	2
Raw Material Consumption	**51,000**	**82,000**	**74,000**	**46,000**	**88,000**

Raw Material 'B' Budget (in units)

Particulars	Nov.	Dec.	Jan.	Feb.	March
Units Produced	25,500	41,000	37,000	23,000	44,000
Raw material for 1 unit in Kg	3	3	3	3	3
Raw Material Consumption	**76,500**	**1,23,000**	**1,11,000**	**69,000**	**1,32,000**

PYQ 10

The Accountant of KPMR Ltd. has prepared the following budget for the coming year 2022 for its two products 'AYE' and 'ZYE':

	Product 'AYE'	Product 'ZYE'
Production & Sales units	4,000	3,000
Selling price per unit	₹200	₹180
Direct Material per unit	₹80	₹70
Direct Labour per unit	₹40	₹35
Variable overhead per unit	₹20	₹25
Fixed overhead per unit	₹10	₹10

After reviewing the above budget, the management has called the marketing team for suggesting some measures for increasing the sales. The marketing team has suggested that by promoting the products on social media, the sales quantity of both the products can be increased by 5%. Also, the selling price per unit will go up by 10%. But this will result in increase in expenditure on variable overhead and fixed overhead by 20% and 5% respectively for both the products.

You are required to prepare flexible budget for both the products:

(a) Before promotion on social media,
(b) After promotion on social media.

[(5 Marks) Dec 2021]

Answer

(a) Flexible Budget before Promotion on Social Media

Particulars	Product 'AYE' (4,000 units)		Product 'ZYE' (3,000 units)	
	Per unit	Total	Per unit	Total
Sales	200.00	8,00,000	180.00	5,40,000
Direct Materials cost	80.00	3,20,000	70.00	2,10,000
Direct Labour cost	40.00	1,60,000	35.00	1,05,000
Variable overhead	20.00	80,000	25.00	75,000
Fixed overhead	10.00	40,000	10.00	30,000
Total cost	**150.00**	**6,00,000**	**140.00**	**4,20,000**
Profit	**50.00**	**2,00,000**	**40.00**	**1,20,000**

(b) Flexible Budget After Promotion on Social Media

Particulars	Product 'AYE' (4,200 units)		Product 'ZYE' (3,150 units)	
	Per unit	Total	Per unit	Total
Sales	220.00	9,24,000	198.00	6,23,700
Direct Materials cost	80.00	3,36,000	70.00	2,20,500

Direct Labour cost	40.00	1,68,000	35.00	1,10,250
Variable overhead	24.00	1,00,800	30.00	94,500
Fixed OH (40,000 + 5%)/(30,000 + 5%)	10.00	42,000	10.00	31,500
Total cost	***154.00***	***6,46,800***	***145.00***	***4,56,750***
Profit	***66.00***	***2,77,200***	***53.00***	***1,66,950***

PYQ 11

SR Ltd. is a manufacturer of Garments. For the first three months of financial year 2022-23 commencing on 1st April 2022, production will be constrained by direct labour. It is estimated that only 12,000 hours of direct labour hours will be available in each month.

For market reasons, production of either of the two garments must be at least 25% of the production of the other. Estimated cost and revenue per garment are as follows:

Particulars	***Shirt (₹)***	***Short (₹)***
Sales price	60	44
Raw materials:		
Fabric @ 12 per meter	24	12
Dyes and cotton	6	4
Direct labour @ 8 per hour	8	4
Fixed overhead @ 4 per hour	4	2
Profit	18	22

From the month of July 2022 direct labour will no longer be a constraint. The company expects to be able to sell 15,000 shirts and 20,000 shorts in July, 2022. There will be no opening stock at the beginning of July 2022.

Sales volumes are expected to grow at 10% per month cumulatively thereafter throughout the year. Following additional information is available:

- The company intends to carry stock of finished garments sufficient to meet 40% of the next month's sale from July 2022 onwards.
- The estimated selling price will be same as above.

Required:

(1) Calculate the number of shirts and shorts to be produced per month in the first quarter of financial year 2022-2023 to maximize company's profit.

(2) Prepare the following budgets on a monthly basis for July, August and September 2022:

(a) Sales budget showing sales units and sales revenue for each product.

(b) Production budget (in units) for each product.

[(10 Marks) May 2022]

Answer

(1) Calculation of the number of shirts and shorts to be produced per month:

(a) Contribution per labour hour:

Particulars	***Shirt (₹)***	***Short (₹)***
Sales price per unit	60	44
Less: Variable cost per unit:		
Raw materials (24 + 6) & (12 + 4)	30	16
Direct labour	8	4
Contribution per unit	***22***	***24***
÷ Labour hour per unit (8 ÷ 8) & (4 ÷ 8)	÷1	÷0.5
Contribution per labour hour	***22***	***48***

(b) Production plan for the first three months:

Since, Shorts has the higher Contribution per labour hour, it will be made first. Shirts will be 25% of Shorts.

Let the Quantity of Shorts be X and Shirts will be 0.25 X, then

(Qty. of Shorts × labour hour p.u.) +	(Qty. of Shirts × labour hour p.u.)	=		Total labour hours
(X × 0.5 hour) + (0.25X × 1 hour)	=	12,000 hours		
0.5X + 0.25X	=	12,000		
X	=	12,000 ÷ 0.75	=	16,000 units of Shorts
Therefore, for Shirts	=	25% of 16,000 units	=	4,000 units

Production per month for the first quarter will be Shorts 16,000 units & Shirts 4,000 units.

(2) (a) Sales Budget for the month of July, August & September 2022

Particulars	July 2022		August 2022		September 2022	
	Shirts	Shorts	Shirts	Shorts	Shirts	Shorts
Sales demand (units)	15,000	20,000	16,500	22,000	18,150	24,200
Selling price per unit	60	44	60	44	60	44
Sales Revenue (₹)	***9,00,000***	***8,80,000***	***9,90,000***	***9,68,000***	***10,89,000***	***10,64,800***

(2) (b) Production budget for the month of July, August & September 2022

Particulars	July 2022		August 2022		September 2022	
	Shirts	Shorts	Shirts	Shorts	Shirts	Shorts
Sales demand (units)	15,000	20,000	16,500	22,000	18,150	24,200
Add: Closing stock (40% of next month)	6,600	8,800	7,260	9,680	7,986	10,648
Less: Opening stock	-	-	(6,600)	(8,800)	(7,260)	(9,680)
Production (units)	***21,600***	***28,800***	***17,160***	***22,880***	***18,876***	***25,168***

Working Note: Sales demand for October 2022:

Shirts	=	18,150 + 10%	=	19,965
Shorts	=	24,200 + 10%	=	26,620

PYQ 12

A Limited has furnished the following information for the months from 1st January to 30th April, 2023:

	January	February	March	April
Number of Working days	25	24	26	25
Production (in units) per Working day	50	55	60	52
Raw Material Purchases (% by weight to total of 4 months)	21%	26%	30%	23%
Purchase price of raw material (per kg)	₹10	₹12	₹13	₹11

Quantity of raw material per unit of product : 4 kg.
Opening stock of raw material on 1st January : 6,020 kg. (Cost ₹63, 210)
Closing stock of raw material on 30th April : 5,100 kg.

All the purchases of material are made at the start of each month.

Required:

(a) Calculate the consumption of raw materials (in kgs) month-by-month and in total.

(b) Calculate the month-wise quantity and value of raw materials purchased.

(c) Prepare the priced stores ledger for each month using the FIFO method.

[(10 Marks) May 2023]

Answer

(a) Raw Material Consumption Budget in Kgs

Particulars	***January***	***February***	***March***	***April***	***Total***
No. of working days	25	24	26	25	-
Production in units per day	50	55	60	52	-
Monthly production in units	1,250	1,320	1,560	1,300	5,430
Raw Material Consumption @ 4 kg p.u.	***5,000***	***5,280***	***6,240***	***5,200***	***21,720***

(b) Raw Material Purchase Budget in Quantity and Value

Particulars	***January***	***February***	***March***	***April***
Raw Material Purchases (%)	21%	26%	30%	23%
Purchase in kgs (20,800 kgs × % of purchase)	4,368 kgs	5,408 Kgs	6,240 kgs	4,784 kgs
Purchase price per kg	₹10	₹12	₹13	₹11
Purchase in Value	***₹43,680***	***₹64,896***	***₹81,120***	***₹52,624***

Working note:

Total Purchase of Raw Material (January to April) = Consumption + Closing Stock –Opening Stock
= 21,720 + 5,100 – 6,020
= 20,800 Kgs.

(c) Stores Ledger (FIFO Method)

Months	***Receipts***			***Issues***			***Balance***		
	Kgs	***Rate***	***Value***	***Kgs***	***Rate***	***Value***	***Kgs***	***Rate***	***Value***
Opening							6,020	10.5	63,210
January	4,368	10	43,680	5,000	10.5	52,500	1,020 4,368	10.5 10	10,710 43,680
February	5,408	12	64,896	1,020 4,260	10.5 10	10,720 42,600	108 5,408	10 12	1,080 64,896
March	6,240	13	81,120	108 5,408 724	10 12 13	1,080 64,896 9,412	5,516	13	71,708
April	4,784	11	52,624	5,200	13	67,600	316 4,784	13 11	4,108 52,624

PYQ 13

PQR Limited manufactures three products – X, Product Y and Product Z. The output for the current year is 2,50,000 units of Product X, 2,80,000 units of Product Y and 3,20,000 units of Product Z respectively.

Selling price of Product X is 1.25 times of Product Z whereas Product Y can be sold at double the price at which product Z can be sold. Product Z can be sold at a profit of 20% on its marginal cost.

Other information are as follows:

	Product X	***Product Y***	***Product Z***
Direct Materials Cost (per unit)	₹20	₹20	₹20
Direct Wages Cost (per unit)	₹16	₹24	₹16

Raw materials used for manufacturing all the three products is the same. Direct Wages are paid @ ₹4 per

labour hour. Total overhead cost of the company is ₹52,80,000 for the year, out of which ₹1 per labour is variable and the rest is fixed.

In the next year it is expected that sales of product X and product Z will increase by 12% and 15% respectively and sale of product Y will decline by 5%. The total overhead cost of the company for the next year is estimated at ₹55,08,000. The variable cost of ₹1 per labour hour remains unchanged. It is anticipated that all other costs will remain same for the next year and there is no opening and closing stock. Selling Price per unit of each product will remain unchanged in the next year.

Prepare a budget showing the current position and the position for the next year clearly indicating the total product-wise contribution and profit for the company as a whole.

[(10 Marks) May 2023]

Answer

(1) Statement Showing Product-wise Contribution and Profit for the Company (Current Position)

Particulars	*Product X*	*Product Y*	*Product Z*	*Total*
Sales (Units)	2,50,000	2,80,000	3,20,000	8,50,000
Sales value @ ₹60, ₹96 and ₹48 per unit	***1,50,00,000***	***2,68,80,000***	***1,53,60,000***	***5,72,40,000***
Direct materials @ ₹20 per unit	50,00,000	56,00,000	64,00,000	1,70,00,000
Direct wages @ ₹16, ₹24 and ₹16 per unit	40,00,000	67,20,000	51,20,000	1,58,40,000
Variable overheads @ ₹1 per hour	10,00,000	16,80,000	12,80,000	39,60,000
Marginal cost	1,00,00,000	1,40,00,000	1,28,00,000	3,68,00,000
Contribution	***50,00,000***	***1,28,80,000***	***25,60,000***	***2,04,40,000***
Less: Fixed overheads				13,20,000
Profit				***1,91,20,000***

(2) Statement Showing Product-wise Contribution and Profit for the Company (Next Year)

Particulars	*Product X*	*Product Y*	*Product Z*	*Total*
Sales (Units)	2,80,000	2,66,000	3,68,000	9,14,000
Sales value @ ₹60, ₹96 and ₹48 per unit	***1,68,00,000***	***2,55,36,000***	***1,76,64,000***	***6,00,00,000***
Direct materials @ ₹20 per unit	56,00,000	53,20,000	73,60,000	1,82,80,000
Direct wages @ ₹16, ₹24 and ₹16 per unit	44,80,000	63,84,000	58,88,000	1,67,52,000
Variable overheads @ ₹1 per hour	11,20,000	15,96,000	14,72,000	41,88,000
Marginal cost	1,12,00,000	1,33,00,000	1,47,20,000	3,92,20,000
Contribution	***56,00,000***	***1,22,36,000***	***29,44,000***	***2,07,80,000***
Less: Fixed overheads				13,20,000
Profit				***1,94,60,000***

Working note:

(a) Labour hours (Current) = 2,50,000 units × 16/4 + 2,80,000 units × 24/4 + 3,20,000 units ×16/4
= 10,00,000 hours + 16,80,000 hours + 12,80,000 hours
= 39,60,000 hours

(b) Fixed OH (Current) = Total OH – Variable OH
= ₹52,80,000 – 39,60,000 hours × ₹1 = ₹13,20,000

(c) Sale price of Product Z = Marginal cost p.u. + 20%
= (₹20 + ₹16 + 4 hours × ₹1) + 20% = ₹48 per unit

(d) Sale price of Product X = 1.25 times of ₹48 = ₹60 per unit

(e) Sale price of Product Y = 2 times of ₹48 = ₹96 per unit

(f) Labour hours (Next year) = 2,80,000 units × 4H + 2,66,000 units × 6H + 3,68,000 units × 4H
= 11,20,000 hours + 15,96,000 hours + 14,72,000 hours
= 41,88,000 hours

(g) Fixed OH (Next year) = Total OH – Variable OH
= ₹55,08,000 – 41,88,000 hours × ₹1 = ₹13,20,000

SUGGESTED REVISION FOR EXAM:

BQ: 3, 4, 5, 7, 8, 9, 10, 12, 14, 15

PYQ: 8, 9, 11, 13

CHAPTER 12 STANDARD COSTING

MATERIAL COST VARIANCE

BQ 1

The standard and actual figures of product 'Z' are as under:

	Standard	Actual
Material quantity	50 units	45 units
Material price per unit	₹1.00	₹0.80

Calculate material cost variance.

Answer

(i) Material Price Variance = Actual Quantity (Standard Price – Actual Price)
= 45 units (₹1.00 - ₹0.80) = ***₹9 F***

(ii) Material Usage Variance = Standard Price (Standard Quantity – Actual Quantity)
= ₹1.00 (50 units - 45 units) = ***₹5 F***

(iii) Material Cost Variance = Standard cost – Actual cost
= ₹50 - ₹36 = ***₹14 F***

(a) Standard cost = Standard Quantity × Standard Price
= 50 units × ₹1.00 = ***₹50.00***

(b) Actual cost = Actual Quantity × Actual Price
= 45 units × ₹0.80 = ***₹36.00***

BQ 2

NXE Manufacturing Concern furnishes the following information:

Standard:	Material for 70 kg finished products	100 kg.
	Price of material	₹1 per kg.
Actual:	Output	2,10,000 kg.
	Material used	2,80,000 kg.
	Cost of Materials	₹2,52,000

Calculate:

(a) Material usage variance,
(b) Material price variance,
(c) Material cost variance.

Answer

(a) Material Usage Variance = SP × (SQ – AQ)
= ₹1.00 × (3,00,000 – 2,80,000) = ***₹20,000 F***

(b) Material Price Variance = AQ × (SP – AP)
= 2,80,000 × (₹1.00 - ₹0.90) = ***₹28,000 F***

(c) Material Cost Variance = (SQ × SP) – (AQ × AP)
= (3,00,000×1) – (2,80,000×0.90) = ***₹48,000 F***

Working notes:

1. SQ of input for actual output = 2,10,000 kg × $\frac{100 \text{ kgs}}{70 \text{ kgs}}$ = 3,00,000 kgs

2. Actual Price (AP) = ₹2,52,000 ÷ 2,80,000 kg = ₹0.90 per kg.

BQ 3

The standard cost of a chemical mixture is as follows:

40% material A	at ₹20 per kg.
60% material B	at ₹30 per kg.

A standard loss of 10% of input is expected in production. The cost records for a period showed the following usage:

90 kg material A	at a cost of ₹18 per kg.
110 kg material B	at a cost of ₹34 per kg.

The quantity produced was 182 kg. of good product.

Calculate (1) Material Price Variance, (2) Material Usage variance and (3) Material Cost variance.

Answer

1. Material Price Variance = (AQ × SP) – (AQ × AP)
= ₹5,100 - ₹5,360 = ***₹260 A***

2. Material Usage Variance = (SQ × SP) – (AQ × SP)
= ₹5,257.78 – ₹5,100 = ***₹157.78 F***

3. Material Cost Variance = (SQ × SP) – (AQ × AP)
= ₹5,257.78 – ₹5,360 = ***₹102.22 A***

Working notes:

(a) Analysis Table

Materials	*SQ × SP*	*AQ × SP*	*AQ × AP*
A	80.88 kg × ₹20	90 kg × ₹20	90 kg × ₹18
B	121.33 kg × ₹30	110 kg × ₹30	110 kg × ₹34
Total	₹5,257.78	₹5,100	₹5,360

(b) SQ of input for actual output = 182 kg ÷ 90% = 202.22 kgs
Materials A = 202.22 kgs × 40% = 80.88 kgs
Materials B = 202.22 kgs × 60% = 121.33 kgs

BQ 4

For making 10 kg. of CEMCO, the standard material requirements is:

Materials	*Quantity (kg)*	*Rate per kg. (₹)*
A	8	6.00
B	4	4.00

During April, 1,000 kg of CEMCO were produced. The actual consumption of materials is as under:

Materials	*Quantity (kg)*	*Rate per kg. (₹)*
A	750	7.00
B	500	5.00

Calculate:

(a) Material Cost Variance;
(b) Material Price Variance;
(c) Material Usage Variance.

Answer

(a) Material Cost Variance = (SQ × SP) – (AQ × AP)
= ₹6,400 – ₹7,750 = ***₹1,350 A***

(b) Material Price Variance = (AQ × SP) – (AQ × AP)
= ₹6,500 - ₹7,750 = ***₹1,250 A***

(c) Material Usage Variance = (SQ × SP) – (AQ × SP)
= ₹6,400 – ₹6,500 = ***₹100 A***

Working notes:

1. Basic calculation

Materials	***SQ × SP***	***AQ × SP***	***AQ × AP***
A	800 kg × ₹6	750 kg × ₹6	750 kg × ₹7
B	400 kg × ₹4	500 kg × ₹4	500 kg × ₹5
Total	₹6,400	₹6,500	₹7,750

2. SQ of input for actual output:

Materials A = (8 kg ÷ 10 kg) × 1,000 kg = 800 kgs
Materials B = (4 kg ÷ 10 kg) × 1,000 kg = 400 kgs

BQ 5

The Standard mix to produce one unit of product is as follows:

Material X	60	units @ ₹15 per unit	₹900
Material Y	80	units @ ₹20 per unit	₹1,600
Material Z	100	units @ ₹25 per unit	₹2,500
	240		***₹5,000***

During the month of April, 10 units were actually produced and consumption was as follows:

Material X	640	units @ ₹17.50 per unit	₹11,200
Material Y	950	units @ ₹18.00 per unit	₹17,100
Material Z	870	units @ ₹27.50 per unit	₹23,925
	2,460		***₹52,225***

Calculate all material variances.

Answer

1. Material Cost Variance = (SQ × SP) – (AQ × AP)
= ₹50,000 – ₹52,225 = ***₹2,225 A***

2. Material Price Variance = (AQ × SP) – (AQ × AP)
= ₹50,350 - ₹52,225 = ***₹1,875 A***

3. Material Usage Variance = (SQ × SP) – (AQ × SP)
= ₹50,000 – ₹50,350 = ***₹350 A***

4. Material Mix Variance = (RSQ × SP) – (AQ × SP)
= ₹51,250 – ₹50,350 = ***₹900 F***

5. Material Yield Variance = (SQ × SP) – (RSQ × SP)
= ₹50,000 – ₹51,250 = ***₹1,250 A***

Working notes:

a. Basic Calculation

Materials	*SQ × SP*	*RSQ × SP*	*AQ × SP*	*AQ × AP*
X	600 × ₹15.00	615 × ₹15.00	640 × ₹15.00	640 × ₹17.50
Y	800 × ₹20.00	820 × ₹20.00	950 × ₹20.00	950 × ₹18.00
Z	1,000 × ₹25.00	1,025 × ₹25.00	870 × ₹25.00	870 × ₹27.50
Total	₹50,000	₹51,250	₹50,350	₹52,225

b. SQ of input for actual output:

Materials X	=	60 units × 10 units of FG	=	600 units
Materials Y	=	80 units × 10 units of FG	=	800 units
Materials Z	=	100 units × 10 units of FG	=	1,000 units

c. RSQ (Revised Standard Quantity)of actual input:

Materials X	=	2,460 units × 60/240	=	615 units
Materials Y	=	2,460 units × 80/240	=	820 units
Materials Z	=	2,460 units × 100/240	=	1,025 units

BQ 6

A company manufactures a particular product the standard direct materials cost of which is ₹10 per unit. The following is obtained from the costing records:

(a) Standard:

Material	*Quantity*	*Rate*	*Amount*
A	70	10.00	700.00
B	30	5.00	150.00
	100		***850.00***
Loss: (15%)	15		NIL
	85		***850.00***

(b) Actual result:

Material	*Quantity*	*Rate*	*Amount*
A	400	11.00	4,400.00
B	200	6.00	1,200.00
	600		***5,600.00***
Loss:	60		NIL
	540		***5,600.00***

Compute:

(i) Material Price Variance;
(ii) Material Mix Variance;
(iii) Material Yield Variance;
(iv) Material Usage Variance; and
(v) Total Material Cost Variance.

[(i) 600 A (ii) 100 F (iii) 300 F (iv) 400 F (v) 200 A]

BQ 7

The standard cost of a chemical mixture is as follows:

60% of Material A @ ₹50 per kg
40% of Material B @ ₹60 per kg

A standard loss of 25% on output is expected in production. The cost records for a period has shown the following usage:

540 kg of Material A @ ₹60 per kg
260 kg of Material B @ ₹50 per kg

The quantity processed was 680 kilograms of good product.

From the above given information calculate:

(1) Material Cost Variance
(2) Material Price Variance
(3) Material Usage Variance
(4) Material Mix Variance
(5) Material Yield Variance

Answer

(1) Material Cost Variance = (SQ × SP) – (AQ × AP)
= ₹45,900 – ₹45,400 = ***₹500 F***

(2) Material Price Variance = (AQ × SP) – (AQ × AP)
= ₹42,600 - ₹45,400 = ***₹2,800 A***

(3) Material Usage Variance = (SQ × SP) – (AQ × SP)
= ₹45,900 – ₹42,600 = ***₹3,300 F***

(4) Material Mix Variance = (RSQ × SP) – (AQ × SP)
= ₹43,200 – ₹42,600 = ***₹600 F***

(5) Material Yield Variance = (SQ × SP) – (RSQ × SP)
= ₹45,900 – ₹43,200 = ***₹2,700 F***

Working notes:

(a) Basic Calculation

Materials	*SQ × SP*	*RSQ × SP*	*AQ × SP*	*AQ × AP*
A	510 × ₹50	480 × ₹50	540 × ₹50	540 × ₹60
B	340 × ₹60	320 × ₹60	260 × ₹60	260 × ₹50
Total	₹45,900	₹43,200	₹42,600	₹45,400

(b) SQ of input for actual output:

Input – Loss = Output
Input – 25% Output = Output
Input = 125% Output
Input of Raw Material = 125% × 680 kgs of Good Product = 850 kgs

Materials A = 850 kgs × 60% = 510 kgs
Materials B = 850 kgs × 40% = 340 kgs

(c) RSQ (Revised Standard Quantity)of actual input:

Materials A = 800 kgs × 60% = 480 kgs
Materials B = 800 kgs × 40% = 320 kgs

BQ 8

Vinayak Ltd. produces an article by blending two basic raw materials. It operates a standard costing system and the following standards have been set for raw materials:

Materials	*Mix*	*Standard price per kg*
A	40%	₹4.00
B	60%	₹3.00

The standard loss in processing is 15%. During April, 2023, the company produced 1,700 kg of finished output and the position of stock and purchased for the month of April, 2023 is as under:

Material	Stock on 01.04.23	Stock on 30.04.23	Purchased during April' 23	
			kg	Cost (₹)
A	35 kgs	5 kgs	800	3,400
B	40 kgs	50 kgs	1,200	3,000

Calculate material variances (Price variance on the basis of consumption).

[MPV 376.25 F, MMV 22 A, MYV 68 A, MUV 90 A, MCV 286.25 F]

BQ 9

J.K. Ltd. manufactures NXE by mixing three raw materials. For every batch of 100 kg. of NXE, 125 kg. of raw materials are used. In April, 60 batches were prepared to produce an output of 5,600 kg. of NXE. The standard and actual particulars for April, are as follows:

Materials	Standard		Actual		Materials Purchased
	Mix	Price per kg	Mix	Price per kg	
	%	(₹)	%	(₹)	(kg)
A	50	20	60	21	5,000
B	30	10	20	8	2,000
C	20	5	20	6	1,200

Calculate all variances.

Answer

1. Material Price Variance = (AQP × SP) – (AQP × AP)
(Based on purchase) = ₹1,26,000 - ₹1,28,200 = **₹2,200 A**

Or

Material Price Variance = (AQ used × SP) – (AQ used × AP)
(Based on consumption) = ₹1,12,500 - ₹1,15,500 = **₹3,000 A**

2. Material Mix Variance = (RSQ × SP) – (AQ × SP)
= ₹1,05,000 – ₹1,12,500 = **₹7,500 A**

3. Material Yield Variance = (SQ × SP) – (RSQ × SP)
= ₹98,000 – ₹1,05,000 = **₹7,000 A**

4. Material Usage Variance = (SQ × SP) – (AQ × SP)
= ₹98,000 – ₹1,12,500 = **₹14,500 A**

5. Material Cost Variance = MUV + MPV
(based on purchase) = ₹14,500 A + ₹2,200 A = **₹16,700 A**

Or

Material Cost Variance = (SQ × SP) – (AQ × AP)
(based on consumption) = ₹98,000 – ₹1,15,500 = **₹17,500 A**

Working notes:

a. Basic calculation

Materials	SQ × SP	RSQ × SP	AQC × SP	AQC × AP	AQP × SP	AQP × AP
A	3,500 × ₹20	3,750 × ₹20	4,500 × ₹20	4,500 × ₹21	5,000 × ₹20	5,000 × ₹21
B	2,100 × ₹10	2,250 × ₹10	1,500 × ₹10	1,500 × ₹8	2,000 × ₹10	2,000 × ₹8
C	1,400 × ₹5	1,500 × ₹5	1,500 × ₹5	1,500 × ₹6	1,200 × ₹5	1,200 × ₹6
Total	₹98,000	₹1,05,000	₹1,12,500	₹1,15,500	₹1,26,000	₹1,28,200

b.	Actual quantity of materials used	=	125 kg × 60 batches	=	7,500 kgs.
	Materials A	=	7,500 kgs. × 60%	=	4,500 kgs.
	Materials B	=	7,500 kgs. × 20%	=	1,500 kgs.
	Materials C	=	7,500 kgs. × 20%	=	1,500 kgs.
c.	RSQ (Revised Standard Quantity) of actual input:				
	Materials A	=	7,500 kgs. × 50%	=	3,750 kgs.
	Materials B	=	7,500 kgs. × 30%	=	2,250 kgs.
	Materials C	=	7,500 kgs. × 20%	=	1,500 kgs.
d.	SQ of input for actual output	=	5,600 kgs × 125 kg/100 kg	=	7,000 kgs.
	Materials A	=	7,000 kgs. × 50%	=	3,500 kgs.
	Materials B	=	7,000 kgs. × 30%	=	2,100 kgs.
	Materials C	=	7,000 kgs. × 20%	=	1,400 kgs.

BQ 10

GAP Limited operates a system of standard costing in respect of one of its products which is manufactured within a single cost centre. Following are the details:

Budgeted data:

Material	*Quantity*	*Price*	*Amount (₹)*
A	60	20	1,200
B	40	30	1,200
	100		***2,400***
Normal Loss:	20		-
Output	***80***		***2,400***

Actual data:

Material	*Quantity*	*Price*	*Amount (₹)*
A	70	?	?
B	?	30	?

Material Price Variance (A)	₹105A
Material Cost Variance	₹275A

You are required to calculate:

1. Actual Price of material A
2. Actual Quantity of material B
3. Material Price Variance
4. Material Usage Variance
5. Material Mix Variance
6. Material Sub Usage (Yield) Variance

Answer

1. Actual Price of Material A:

Material Price Variance (A)	=	AQ × (SP - AP)	=	70 × (₹20 - AP)	
₹105A	=	1,400 – 70 AP			
70 AP	=	₹1,505			
AP	=	₹1,505 ÷ 70	=	***₹21.50***	

2. *Actual Quantity of Material B:*

Material Cost Variance	=	(SQ × SP) – (AQ × AP)		
₹275A	=	{(60 × 20) + (40 × 30)} – {(70 × 21.5) + (AQ_B × 30)}		
₹275A	=	₹2,400 – ₹1,505 – 30 AQ_B		
30 AQ_B	=	₹1,170		
AQ of Materials B	=	₹1,170 ÷ 30	=	***39 units***
3. Material Price Variance	=	(AQ × SP) – (AQ × AP)		
	=	₹2,570 - ₹2,675	=	***₹105 A***
4. Material Usage Variance	=	(SQ × SP) – (AQ × SP)		
	=	₹2,400 – ₹2,570	=	***₹170 A***
5. Material Mix Variance	=	(RSQ × SP) – (AQ × SP)		
	=	₹2,616 – ₹2,570	=	***₹46 F***
6. Material Yield Variance	=	(SQ × SP) – (RSQ × SP)		
	=	₹2,400 – ₹2,616	=	***₹216 A***

Working notes:

a. Basic Calculation

Materials	*SQ × SP*	*RSQ × SP*	*AQ × SP*	*AQ × AP*
A	60 × ₹20	65.4 × ₹20	70 × ₹20	70 × ₹21.50
B	40 × ₹30	43.6 × ₹30	39 × ₹30	39 × ₹30
Total	₹2,400	₹2,616	₹2,570	₹2,675

b. RSQ (Revised Standard Quantity):

Materials A	=	109 units × 60/100	=	65.4 units
Materials B	=	109 units × 40/100	=	43.6 units

BQ 11

Following data is extracted from the books of XYZ Ltd. for the month of January, 2023:

1. *Estimation:*

Particulars	*Quantity (kg.)*	*Price (₹)*	*Amount (₹)*
Material A	800	?	-
Material B	600	30.00	18,000

Normal loss was expected to be 10% of total input materials.

2. *Actuals:* 1480 kg of output produced.

Particulars	*Quantity (kg.)*	*Price (₹)*	*Amount (₹)*
Material A	900	?	-
Material B	?	32.50	-
			59,825

3. *Other Information:*

Material Cost Variance	₹3,625 (F)
Material Price Variance	₹175 (F)

You are required to calculate:

1. Standard Price of Material A;
2. Actual Quantity of Material B;
3. Actual Price of Material A;
4. Revised standard quantity of Material A and Material B; and
5. Material Mix Variance.

Answer

1.	Material Cost Variance	=	(SQ × SP) – (AQ × AP)		
	₹3,625	=	(SQ × SP) – ₹59,825		
	(SQ × SP)	=	₹63,450		
	$(SQ_A \times SP_A) + (SQ_B \times SP_B)$	=	₹63,450		
	$(940 \text{ kg} \times SP_A) + (705 \text{ kg} \times ₹30)$	=	₹63,450		
	$(940 \text{ kg} \times SP_A) + ₹21,150$	=	₹63,450		
	$(940 \text{ kg} \times SP_A)$	=	₹42,300		
	SP_A	=	42,300 ÷ 940 kg		
	Standard Price of Material A	=	***₹45***		

Working notes:

(a)	SQ of input for actual output	=	1,480 kg ÷ 90%	=	1,645 kgs
	Materials A	=	1,645 kgs × 8/14	=	940 kgs
	Materials B	=	1,645 kgs × 6/14	=	705 kgs
2.	Material Price Variance (A + B)	=	(AQ × SP) – (AQ × AP)		
	₹175	=	(AQ × SP) – ₹ 59,825		
	(AQ × SP)	=	₹60,000		
	$(AQ_A \times SP_A) + (AQ_B \times SP_B)$	=	₹60,000		
	$(900 \text{ kg} \times ₹45) + (AQ_B \times ₹30)$	=	₹60,000		
	$(AQ_B \times ₹30)$	=	₹60,000 - ₹40,500	=	₹19,500
	Actual Quantity of Material B	=	₹19,500 ÷ ₹30	=	***650 kg.***
3.	Actual Material Cost (A + B)	=	(AQ × AP)	=	₹59,825
	$(AQ_A \times AP_A) + (AQ_B \times AP_B)$	=	₹59,825		
	$(900 \text{ kg} \times AP_A) + (650 \text{ kg} \times ₹ 32.5)$	=	₹59,825		
	$(900 \text{ kg} \times AP_A) + ₹21,125$	=	₹59,825		
	$(900 \text{ kg} \times AP_A)$	=	₹38,700		
	Actual Price of Material A	=	₹38,700 ÷ 900 kg	=	***₹43***
4.	Revised Standard Quantity (RSQ) of A & B:				
	Materials A	=	(900 + 650) × 8/14	=	***886 kgs***
	Materials B	=	(900 + 650) × 6/14	=	***664 kgs***
5.	Material Mix Variance (A + B)	=	(RSQ × SP) – (AQ × SP)		
		=	(886 × 45) + (664 × 30) – 60,000		
		=	***₹210 A***		

BQ 12

One kilogram of product K requires two chemicals A and B. The following were the details of product K for the month of June 2023:

(a) Standard mix for chemical A is 50% and chemical B is 50%.

(b) Standard price kilogram of chemical A is ₹12 and chemical B is ₹15.
(c) Actual input of chemical B is 70 kilograms.
(d) Actual price per kilogram of chemical A is ₹15.
(e) Standard normal loss is 10% of total input.
(f) Total Material cost variance is ₹650 adverse.
(g) Total Material yield variance is ₹135 adverse.

You are required to calculate:

(1) Total Material mix variance
(2) Total Material usage variance
(3) Total Material price variance
(4) Actual loss of actual input
(5) Actual input of chemical A
(6) Actual price per kg. of chemical B

Answer

(1) Material Mix Variance = (RSQ × SP) – (AQ × SP)
= ₹1,485 – ₹1,530 = ***₹45 A***

(2) Material Usage Variance = (SQ × SP) – (AQ × SP)
= ₹1,350 – ₹1,530 = ***₹180 A***

(3) Material Price Variance = (AQ × SP) – (AQ × AP)
= ₹1,530 – ₹2,000 = ***₹470 A***

(4) Actual loss of actual input = Actual input – Actual output
= 110 kg – 90 kg = ***20 Kgs***

(5) Actual input of chemical A = ***40 Kgs***

(6) Actual Price per kg of B = ***₹20***

Working Notes:

(a) Calculation of standard mix of input (assuming Standard input as 100 kg, it will be given in exam):

Material	*Quantity in Kg*	*Rate*	*Amount*
A	50	12.00	600.00
B	50	15.00	750.00
	100		***1,350.00***
Loss: (10%)	10		NIL
	90		***1,350.00***

(b) Let the actual input of chemical A be X kg. and the actual price of chemical B be ₹Y

Given,

Material Yield Variance = (Total Standard input – Total Actual input) × Std cost p. u. of input
135 A = [100 – (70 + X)] × 13.5 (1,350 ÷ 100 kg)
-135 = (30 – X) × 13.5
-10 = 30 – X
X = ***40 Kg.***

Also,

Material Cost Variance	=	(SQ × SP) – (AQ × AP)
650 A	=	1,350 – {(40 × 15) + (70 × Y)}
- 650	=	1,350 – 600 – 70 Y
- 650 – 750	=	70 Y
Y	=	***₹20***

(c) Basic Calculation

Materials	*SQ × SP*	*RSQ × SP*	*AQ × SP*	*AQ × AP*
A	50 × ₹12	55 × ₹12	40 × ₹12	40 × ₹15
B	50 × ₹15	55 × ₹15	70 × ₹15	70 × ₹20
Total	₹1,350	₹1,485	₹1,530	₹2,000

(d) RSQ (Revised Standard Quantity):

Materials A	=	110 units × 50/100	=	55 units
Materials B	=	110 units × 50/100	=	55 units

LABOUR COST VARIANCE

BQ 13

The following details are available from the records of ABC Ltd. engaged in manufacturing article A of the week ended 28th February:

The standard labour hours and rates of payment per article were as following:

Category of workers	*Hours*	*Rate per hour*	*Total*
Skilled labour	10	₹3.00	₹30.00
Semi-skilled labour	8	₹1.50	₹12.00
Unskilled labour	16	₹1.00	₹16.00
Total	***34***	***-***	***₹58.00***

The actual production was 1,000 articles A for which the actual hours worked and rates are given below:

Category of workers	*Hours*	*Rate per hour*	*Total*
Skilled labour	9,000	₹4.00	₹36,000
Semi-skilled labour	8,400	₹1.50	₹12,600
Unskilled labour	20,000	₹0.90	₹18,000
Total	***37,400***	***-***	***₹66,600***

From the above set of data, you are asked to calculate:

(i) Labour Cost Variance; ***(ii)*** Labour Rate Variance; ***(iii)*** Labour Efficiency; ***(iv)*** Labour Mix Variance and ***(v)*** Labour Yield Variance.

[(i) 8,600 A (ii) 7,000 A (iii) 1,600 A (iv) 4,200 F (v) 5,800 A]

BQ 14

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

Particulars	*Skilled Workers*	*Semi-Skilled Workers*	*Unskilled Workers*
Standard number of workers in the gang	32	12	6
Standard wage rate per hour (₹)	3.00	2.00	1.00
Actual number of workers in the gang	28	18	4
Actual wage rate per hour (₹)	4.00	3.00	2.00

During the 40 hours working week, the gang produced 1,800 standard labour hours of work.

Calculate the various labour variances.

[LRV 2,000 A, LMV 80 F, LYV 504 A, LEV 424 A, LCV 2,424 A]

BQ 15

The standard and actual figures of a firm are as under:

Standard time for the job	1,000 hours
Standard rate per hour	₹0.50
Actual time taken	900 hours
Actual wages paid	₹360

Compute the variances

Answer

1. Labour Rate Variance = (AH × SR) – (AH × AR)
= (900 × ₹0.50) – ₹360 = ***₹90 F***

2. Labour Efficiency Variance = (SH × SR) – (AH × SR)
= (1,000 × ₹0.50) – (900 × ₹0.50) = ***₹50 F***

3. Labour Cost Variance = (SH × SR) – (AH × AR)
= (1,000 × ₹0.50) – ₹360 = ***₹140 F***

BQ 16

NPX Ltd. uses standard costing system for manufacturing of its product X. Following is the budget data given in relation to labour hours for manufacture of 1 unit of Product X:

Labour	*Hours*	*Rate (₹)*
Skilled	2	6
Semi-Skilled	3	4
Un-Skilled	5	3
Total	10	-

In the month of January, 2023, total 10,000 units were produced following are the details:

Labour	*Hours*	*Rate (₹)*	*Amount (₹)*
Skilled	18,000	7	1,26,000
Semi-Skilled	33,000	3.5	1,15,500
Un-Skilled	58,000	4	2,32,000
Total	1,09,000	-	4,73,500

Actual Idle hours (abnormal) during the month:

Skilled	500
Semi-Skilled	700
Un-skilled	800
Total	2,000

Calculate:

(a) Labour Variances.

(b) Also show the effect on Labour Rate Variance if 5,000 hours of Skilled Labour are paid @ ₹5.5 per hour and balance were paid @ ₹7 per hour.

Answer

(a) Calculation of Labour Variances:

Labour Cost Variance	=	(SH × SR) – (AH × AR)		
	=	₹3,90,000 - ₹4,73,500	=	***₹83,500 A***
Labour Rate Variance	=	(AH × SR) – (AH × AR)		
	=	₹4,14,000 – ₹4,73,500	=	***₹59,500 A***
Labour Efficiency Variance	=	(SH × SR) – (AHW × SR)		
	=	₹3,90,000 – ₹4,05,800	=	***₹15,800 A***
Labour Mix Variance	=	(RSH × SR) – (AHW × SR)		
	=	₹4,17,300 – ₹4,05,800	=	***₹11,500 F***
Labour Yield Variance	=	(SH × SR) – (RSH × SR)		
	=	₹3,90,000 – ₹4,17,300	=	***₹27,300 A***
Labour Idle Variance	=	(AHW × SR) – (AH × SR)		
	=	₹4,05,800 – ₹4,14,000	=	***₹8,200 A***

(b) Labour Rate Variance revised:

Labour rate Variance	=	(AH × SR) – (AH × AR)		
Skilled	=	(18,000×6) – (5,000×5.5 + 13,000×7)	=	10,500 A
Semi-Skilled	=	33,000 × (4 – 3.5)	=	16,500 F
Un-Skilled	=	58,000 × (3 - 4)	=	58,000 A
Total	=	10,500 A + 16,500 F + 58,000 A	=	***₹52,000 A***

Effect on Labour Rate Variance= ***Adverse effect decreased by ₹7,500 (₹59,500A to ₹52,000 A)***

Working notes:

1. Basic Calculation

Workers	SH × SR	RSH × SR	AHW × SR	AH × SR	AH × AR
Skilled	20,000 × 6	21,400 × 6	17,500 × 6	18,000 × 6	18,000 × 7
Semi-Skilled	30,000 × 4	32,100 × 4	32,300 × 4	33,000 × 4	33,000 × 3.5
Un-Skilled	50,000 × 3	53,500 × 3	57,200 × 3	58,000 × 3	58,000 × 4
Total	₹3,90,000	₹4,17,300	₹4,05,800	₹4,14,000	₹4,73,500

2. RSH (Revised Standard Hours):

Total Actual Hours Worked	=	17,500 + 32,300 + 57,200	=	1,07,000 hours
Skilled	=	1,07,000 × 2/10	=	21,400 hours
Semi-Skilled	=	1,07,000 × 3/10	=	32,100 hours
Un-Skilled	=	1,07,000 × 5/10	=	53,500 hours

3. SH (Standard hours) for actual output 10,000 units:

Skilled	=	10,000 × 2	=	20,000 hours
Semi-Skilled	=	10,000 × 3	=	30,000 hours
Un-Skilled	=	10,000 × 5	=	50,000 hours

BQ 17

The standard output of a Product 'D' is 50 units per hour in manufacturing department of a Company employing 100 workers. In a 40 hours week, the department produced 1,920 units of product 'D' despite 5% of the time paid was lost due to an abnormal reason. The hourly wage rates actually paid were ₹12.40, ₹12.00 and ₹11.40 respectively to Group 'A' consisting 10 workers, Group 'B' consisting 30 workers and Group 'C' consisting 60 workers. The standard wage rate per labour is same for all the workers. Labour Efficiency Variance is given ₹480 (F).

You are required to compute:

(1) Total Labour Cost Variance.
(2) Total Labour Rate Variance.
(3) Total Labour Gang Variance.
(4) Total Labour Yield Variance, and
(5) Total Labour Idle Time Variance.

Answer

(1) Labour Cost Variance = (SH × SR) – (AH × AR)
= ₹46,080 - ₹46,720 = ***₹640 A***

(2) Labour Rate Variance = (AH × SR) – (AH × AR)
= ₹48,000 – ₹46,720 = ***₹1,280 F***

(3) Labour Gang Variance = (RSH × SR) – (AHW × SR)
= ₹45,600 – ₹45,600 = ***Nil***

(4) Labour Yield Variance = (SH × SR) – (RSH × SR)
= ₹46,080 – ₹45,600 = ***₹480 F***

(5) Labour Idle Variance = (AHW × SR) – (AH × SR)
= ₹45,600 – ₹48,000 = ***₹2,400 A***

Working notes:

(a) Basic Calculation

Workers	*SH × SR*	*RSH × SR*	*AHW × SR*	*AH × SR*	*AH × AR*
Group A	384 × 12	380 × 12	380 × 12	10×40×12	10×40×12.40
Group B	1,152 × 12	1,140 × 12	1,140 × 12	30×40×12	30×40×12.00
Group C	2,304 × 12	2,280 × 12	2,280 × 12	60×40×12	60×40×11.40
Total	₹46,080	₹45,600	₹45,600	₹48,000	₹46,720

(b) RSH (Revised Standard Hours) and AHW (Actual Hours Worked):

Total Actual Hours Worked = (100 workers × 40 hours) – 5% abnormal idle time
= 3,800 hours

Group A = 3,800 × 10/100 = 380 hours
Group B = 3,800 × 30/100 = 1,140 hours
Group C = 3,800 × 60/100 = 2,280 hours

(c) SH (Standard hours) for actual output 1,920 units:

Total standard hours = (100 workers × 1 hour ÷ 50 units) × 1,920 units
= 3,840 hours
Group A = 3,840 × 10/100 = 384 hours

Group B	=	3,840 × 30/100	=	1,152 hours
Group C	=	3,840 × 60/100	=	2,304 hours

(d) Standard wages rate (SR):

Labour Efficiency Variance	=	(SH - AHW) × SR		
480 F	=	(3,840 – 3,800) × SR		
SR	=	480 ÷ 40	=	₹12 per hour

OVERHEAD VARIANCE

BQ 18

The following data for Pijee Ltd. is given:

Particulars	*Budgeted*	*Actual*
Production in units	400	360
Man hours to produce above	8,000	7,000
Variable overheads	₹10,000	₹9,150

The standard time to produce one unit of the product is 20 hours.

Calculate relevant Variable overhead variances.

Answer

(i) Variable Overhead Cost variance = (SH × SR) - (AH × AR)
= (360 × 20 hours × ₹1.25) - ₹9,150 = ***150 A***

(ii) Variable OH Expenditure Variance = (AH × SR) - (AH × AR)
= (7,000 × ₹1.25) - ₹9,150 = ***400 A***

(iii) Variable OH Efficiency Variance = (SH × SR) - (AH × SR)
= (360 × 20 hours × ₹1.25) - (7,000 × ₹1.25)= ***250 F***

Working Notes:

(a) Standard Rate (SR) = Budgeted Variable Overheads ÷ Budgeted Hours
= ₹10,000 ÷ 8,000 hours = ***₹1.25 per hour***

BQ 19

From the following information of G Ltd., Calculate ***(i)*** Variable Overhead Cost Variance; ***(ii)*** Variable Overhead Expenditure Variance and ***(iii)*** Variable Overhead Efficiency Variance:

Budgeted production	6,000 units
Budgeted variable overhead	₹1,20,000
Standard time for one unit of output	2 hours
Actual production	5,900 units
Actual overhead incurred	₹1,22,000
Actual hours worked	11,600 hours

Answer

(i) Variable Overhead Cost variance = (SH × SR) - (AH × AR)
= (11,800 × ₹10) - ₹1,22,000 = ***4,000 A***

(ii) Variable OH Expenditure Variance = (AH × SR) - (AH × AR)

= (11,600 × ₹10) - ₹1,22,000 = ***6,000 A***

(iii) Variable OH Efficiency Variance = (SH × SR) - (AH × SR)
= (11,800 × ₹10) - (11,600 × ₹10) = ***2,000 F***

Working Notes:

(a) Standard Hours (SH) = 5,900 units × 2 hours per unit = ***11,800 hours***

(b) Standard Rate (SR) = Budgeted Variable Overheads ÷ Budgeted Hours
= ₹1,20,000 ÷ 6,000 units × 2 hours = ***₹10 per hour***

BQ 20

The cost detail of J&G Ltd. for the month of September, 2023 is as follows:

Particulars	*Budgeted*	*Actual*
Fixed overhead	₹15,00,000	₹15,60,000
Units of production	7,500	7,800
Standard time for one unit	2 hours	-
Actual hours worked	-	16,000 hours

Required:

Calculate ***(i)*** Fixed Overhead Cost Variance ***(ii)*** Fixed Overhead Expenditure Variance ***(iii)*** Fixed Overhead Volume Variance ***(iv)*** Fixed Overhead Efficiency Variance and ***(v)*** Fixed Overhead Capacity Variance.

Answer

(1) Fixed Overhead Cost Variance = Recovered Fixed OH – Actual Fixed OH

$= \frac{15,00,000}{7,500} \times 7,800 - ₹15,60,000$ = ***Nil***

(2) Fixed OH Expenditure Variance = Budgeted Fixed OH – Actual Fixed OH
= ₹15,00,000 – ₹15,60,000 = ***60,000 A***

(3) Fixed OH Volume Variance = Recovered Fixed OH – Budgeted Fixed OH

$= \frac{15,00,000}{7,500} \times 7,800 - ₹15,00,000$ = ***60,000 F***

(4) Fixed OH Efficiency Variance = Recovered Fixed OH – Recovered Fixed OH for AH
= SH × SR – AH × SR

$= \frac{15,00,000}{7,500} \times 7,800 - \frac{15,00,000}{7,500 \times 2} \times 16,000$

= ₹15,60,000 - ₹16,00,000 = ***40,000 A***

(5) Fixed OH Capacity Variance = Recovered Fixed OH for AH - Budgeted Fixed OH
= ₹16,00,000 - ₹15,00,000 = ***1,00,000 F***

BQ 21

Following information is available from the records of a factory:

Particulars	*Budget*	*Actual*
Fixed overhead for June, 2017	₹10,000	₹12,000
Production in June, 2017 (units)	2,000	2,100
Standard time per unit (hours)	10	-
Actual hours worked in June	-	22,000

Compute: (i) Fixed Overhead Cost Variance, ***(ii)*** Expenditure Variance, ***(iii)*** Volume Variance.

Answer

(i) Fixed Overhead Variance = Absorbed Overheads – Actual Overheads
= (2,100 units × 10 hours × ₹0.50*) – 12,000
= 10,500 – 12,000 = ***1,500 A***

(ii) Fixed OH Expenditure Variance = Budgeted Overheads - Actual Overheads
= 10,000 - 12,000 = ***2,000 A***

(iii) Fixed OH Volume Variance = Absorbed Overheads – Budgeted Overheads
= 10,500 – 10,000 = ***500 F***

*Standard Rate (SH) per hour $= \frac{\text{Budgeted OH}}{\text{Budgeted Hours}}$

$= \frac{10{,}000}{2{,}000 \text{ Units} \times 10 \text{ Hours per unit}}$ = ***₹0.50***

BQ 22

S.V. Ltd. has furnished the following data:

Particulars	*Budget*	*Actual, May' 23*
No. of working days	25	27
Production in units	20,000	22,000
Fixed Overheads (₹)	30,000	31,000

Budgeted fixed overhead rate is ₹1.00 per hour. In May' 23, the actual hours worked were 31,500.

Calculate the following variances in relation to fixed overheads:

(i) Efficiency Variance ***(ii)*** Capacity Variance ***(iii)*** Calendar Variance
(iv) Expenditure Variance ***(v)*** Volume Variance ***(vi)*** Total OH Variance.

[(i) 1,500 F (ii) 900 A (iii) 2,400 F (iv) 1,000 A (v) 3,000 F (vi) 2,000 F]

BQ 23

A company has a normal capacity of 120 machines, working 8 hours per day of 25 days in a month. The fixed overheads are budgeted at ₹1,44,000 per month. The standard time required to manufacture one unit of product is 4 hours.

In April, the company worked 24 days of 840 machine hours per day and produced 5,305 units of output. The actual fixed overheads were ₹1,42,000.

Compute: (i) Expense Variance; ***(ii)*** Volume Variance and ***(iii)*** Total Fixed Overheads Variance

Answer

(i) Fixed OH Expenditure Variance = (BH × SR) - (AH × AR)
= 1,44,000 - 1,42,000 = ***2,000 F***

(ii) Total Volume Variance = (SH × SR) – (BH × SR)
= (5,305 units × 4 hours × ₹6*) – 1,44,000
= 1,27,320 – 1,44,000 = ***16,680 A***

(iii) Fixed overhead variance = (SH × SR) - (AH × AR)
= 1,27,320 – 1,42,000 = ***14,680 A***

*Standard Rate (SH) per hour = $\frac{\text{Budgeted OH}}{\text{Budgeted Hours}}$

= $\frac{1,44,000}{120 \text{ Machines} \times 8 \text{ Hours} \times 25 \text{ Days}}$ = ***₹6/hour***

BQ 24

The following data has been collected from the cost records of a unit for computing the various fixed overhead variances for a period.

Number of budgeted working days	25
Budgeted man-hours per day	6,000
Output (budgeted) per man-hour (in units)	1
Fixed overhead cost as budgeted	₹1,50,000
Actual number of working days	27
Actual man-hours per day	6,300
Actual output per man-hour (in units)	0.9
Actual fixed overhead incurred	₹1,56,000

Calculate the following variances:

(i) Efficiency Variance ***(ii)*** Capacity Variance ***(iii)*** Calendar Variance
(iv) Expenses Variance ***(v)*** Volume Variance ***(vi)*** Total Fixed OH Variance

[(i) 17,010 A (ii) 8,100 F (iii) 12,000 F (iv) 6,000 A (v) 3,090 F (vi) 2,910 A]

BQ 25

The following information was obtained from the records of a manufacturing unit using standard costing system.

Particulars	*Budget*	*Actual, March' 23*
Production in units	4,000	3,800
No. of working days	20	21
Fixed Overheads	₹40,000	₹39,000
Variable Overheads	₹12,000	₹12,000

You are required to calculate the following overhead variance:

(a) Variable Overhead Variance
(b) Fixed Overheads Variances:
(i) Expenditure Variance ***(ii)*** Volume Variance ***(iii)*** Overhead Variance

[(a) 600 A (b)(i) 1,000 F (ii) 2,000 A (iii) 1,000 A]

BQ 26

XYZ Ltd. is having standard costing system in operation for quite some time. The following data relating to the month of April, is available from the cost records:

Particulars	*Budget*	*Actual*
Output (in units)	30,000	32,500
Operating hours	30,000	33,000
Fixed Overheads (₹)	45,000	50,000
Variable Overheads (₹)	60,000	68,000
Working Days	25	26

Calculate overheads variances.

[FOH Variances: Cost 1,250 A, Exp. 5,000 A, Vol. 3,750 F, Cal. 1,800 F, Cap. 2,700 F, Eff. 750 A and VOH Variances: Cost 3,000 A, Expenditure 2,000 A, Efficiency 1,000 A]

BQ 27

XYZ Company has established the following standards for factory overheads:

Variable overheads per unit	:	₹10
Fixed overheads per month	:	₹1,00,000
Capacity of the plant	:	20,000 units per month.

The actual data for the month are as follows:

Actual overheads incurred	:	₹3,00,000
Actual output (units)	:	₹15,000 units

Calculate overhead variances:

(i) Production Volume Variance
(ii) Overhead Expense Variance

Answer

(i) Production or Overhead volume variance (only for fixed overhead)

Fixed Overhead Volume Variance	=	Absorbed Overhead – Budgeted Overhead
	=	(₹5* × 15,000 units) – (₹5 × 20,000 units)
	=	₹75,000 - ₹1,00,000
	=	**₹25,000 A**

*Standard fixed overhead per unit = ₹1,00,000 ÷ 20,000 units = **₹5 per unit**

(ii) Overhead Expense Variance:

Variable Overhead	=	Standard Variable OH – Actual Variable OH
	=	(15,000 units × ₹10) – (15,000 units × ₹10)
	=	**Nil**
Fixed Overhead	=	Budgeted Overhead – Actual Overhead
	=	₹1,00,000 – (Total overhead – Variable overhead)
	=	₹1,00,000 – (₹3,00,000 - ₹10 ×15,000 units)
	=	₹1,00,000 – ₹1,50,000 = **₹50,000 A**

Assumption: Budgeted variable overheads per unit and actual variable overheads per unit are same.

BQ 28

The overhead expense budget for a factory producing to a capacity of 200 units per month is as follows:

Description of overhead	Fixed cost per unit in ₹	Variable cost per unit in ₹	Total cost per unit in ₹
Power and fuel	1,000	500	1,500
Repair and maintenance	500	250	750
Printing and stationary	500	250	750
Other overheads	1,000	500	1,500
Total	**₹3,000**	**₹1,500**	**₹4,500**

The factory has actually produced only 100 units in a particular month. Details of overheads actually incurred have been provided by the accounts department are as follows:

Description of overhead	Actual cost
Power and fuel	₹4,00,000

Repair and maintenance	₹2,00,000
Printing and stationary	₹1,75,000
Other overheads	₹3,75,000

You are required to compute the production volume variance and the overhead expenses variance.

Answer

(i) Production or Overhead volume variance (only for fixed overhead)

Fixed Overhead Volume Variance	=	Absorbed Overhead – Budgeted Overhead		
	=	(₹3,000 × 100 units) – (₹3,000 × 200 units)		
	=	₹3,00,000 - ₹6,00,000	=	***₹3,00,000 A***

(ii) Overhead Expense Variance:

Variable Overhead	=	Standard Variable OH – Actual Variable OH		
	=	(100 units × ₹1,500) – (100 units × ₹1,500)		
	=	***Nil***		
Fixed Overhead	=	Budgeted Overhead – Actual Overhead		
	=	₹6,00,000 – (Total overhead – Variable overhead)		
	=	₹6,00,000 – (₹11,50,000 - ₹1,500 ×100 units)		
	=	₹6,00,000 – ₹1,50,000	=	***₹4,00,000 A***

Assumption: Budgeted variable overheads per unit and actual variable overheads per unit are same.

COMBINED VARIANCE

BQ 29

The following standards have been set to manufacture a product:

Direct Material:	2 units of A @ ₹4 per unit	₹8.00
	3 units of B @ ₹3 per unit	₹9.00
	15 units of C @ ₹1 per unit	₹15.00
		₹32.00
Direct Labour:	3 hrs @ ₹8 per hour	₹24.00
Total standard prime cost		***₹56.00***

The company manufactured and sold 6,000 units of the product during the year. Direct material costs were 12,500 units of A at ₹4.40 per unit; 18,000 units of B at ₹2.80 per unit; and 88,500 units of C at ₹1.20 per unit. The company worked 17,500 direct labour hours during the year. For 2,500 of these hours, the company paid at ₹12 per hour while for the remaining, the wages were paid at standard rate.

Calculate all materials and labour variances.

Answer

1.	Material Price Variance	=	(AQ × SP) – (AQ × AP)		
		=	₹1,92,500 - ₹2,11,600	=	***₹19,100 A***
2.	Material Mix Variance	=	(RSQ × SP) – (AQ × SP)		
		=	₹1,90,400 – ₹1,92,500	=	***₹2,100 A***
3.	Material Yield Variance	=	(SQ × SP) – (RSQ × SP)		

		=	₹1,92,000 – ₹1,90,400	=	***₹1,600 F***
4.	Material Usage Variance	=	(SQ × SP) – (AQ × SP)		
		=	₹1,92,000 – ₹1,92,500	=	***₹500 A***
5.	Material Cost Variance	=	(SQ × SP) – (AQ × AP)		
		=	₹1,92,000 – ₹2,11,600	=	***₹19,600 A***
6.	Labour Rate Variance	=	(AH × SR) – (AH × AR)		
		=	(17,500 × ₹8) - (2,500 × ₹12 + 15,000 × ₹8)		
		=	₹1,40,000 – ₹1,50,000	=	***₹10,000 A***
7.	Labour Efficiency Variance	=	(SH × SR) – (AH × SR)		
		=	(6,000 × 3 hours × ₹8) - (17,500 × ₹8)		
		=	₹1,44,000 – ₹1,40,000	=	***₹4,000 F***
8.	Labour Cost Variance	=	(SH × SR) – (AH × AR)		
		=	₹1,44,000 - ₹1,50,000	=	***₹6,000 A***

Working notes:

a. Basic calculation in respect of materials:

Materials	***SQ × SP***	***RSQ × SP***	***AQ × SP***	***AQ × AP***
A	12,000 × ₹4.00	11,900 × ₹4.00	12,500 × ₹4.00	12,500 × ₹4.40
B	18,000 × ₹3.00	17,850 × ₹3.00	18,000 × ₹3.00	18,000 × ₹2.80
C	90,000 × ₹1.00	89,250 × ₹1.00	88,500 × ₹1.00	88,500 × ₹1.20
Total	₹1,92,000	₹1,90,400	₹1,92,500	₹2,11,600

b. RSQ (Revised Standard Quantity)of actual input:

Total input of materials	=	12,500 + 18,000 + 88,500	=	1,19,000 units
Materials A	=	1,19,000 × 2/20	=	11,900 units
Materials B	=	1,19,000 × 3/20	=	17,850 units
Materials C	=	1,19,000 × 15/20	=	89,250 units

c. SQ of input for actual output:

Materials A	=	6,000 units × 2 units	=	12,000 units
Materials B	=	6,000 units × 3 units	=	18,000 units
Materials C	=	6,000 units × 15 units	=	90,000 units

BQ 30

The following information is available from the cost records of Novell & Co. for the month of March 2023:

Materials purchased	20,000 units @ ₹88,000
Materials consumed	19,000 units
Actual wages paid for 4,950 hrs	₹24,750
Units produced	1,800 units
Standard rates and pieces are:	
Direct material	₹4 per unit
Standard output	10 number for one unit
Direct labour rate	₹4.00 per hour
Standard requirement	2.5 hours per unit

You are required to calculate relevant material (based on consumption) and labour variance for the month.

Answer

(a)	Material Cost Variance	=	(SQ × SP) – (AQ × AP)		
		=	(1,800 units × 10 units × ₹4) – (19,000 units × ₹4.40*)		
		=	₹72,000 – ₹83,600	=	***₹11,600 A***
	*Actual Purchase Price (AP)	=	₹88,000 ÷ 20,000 units	=	***₹4.40***
(b)	Material Price Variance	=	(SP – AP) × AQ		
		=	(₹4.00 - ₹4.40) × 19,000 units	=	***₹7,600 A***
(c)	Material Usage Variance	=	(SQ × SP) – (AQ × SP)		
		=	(1,800 units × 10 units × ₹4) – (19,000 units × ₹4.00)		
		=	₹72,000 – ₹76,000	=	***₹4,000 A***
(d)	Labour Cost Variance	=	(SH × SR) – (AH × AR)		
		=	(1,800 units × 2.5 hrs × ₹4) – ₹24,750		
		=	₹18,000 – ₹24,750	=	***₹6,750 A***
(e)	Labour Efficiency Variance	=	(SH × SR) – (AH × SR)		
		=	(1,800 units × 2.5 hrs × ₹4) – (4,950 hours × ₹4.00)		
		=	₹18,000 – ₹19,800	=	***₹1,800 A***
(f)	Labour Rate Variance	=	(SR – AR) × AH		
		=	(₹4.00 - ₹5.00) × 4,950 hours	=	***₹4,950 A***
	*Actual Rate (AR)	=	₹24,750 ÷ 4,950 hours	=	***₹5.00***

BQ 31

Paras Synthetics uses Standard costing system in manufacturing of its product 'Star 95 Mask'. The details are as follows;

Direct Material 0.50 Meter @ ₹60 per meter	₹30
Direct Labour 1 hour @ ₹20 per hour	₹20
Variable overhead 1 hour @ ₹10 per hour	₹10
Total	***₹60***

During the month of August, 2023 10,000 units of 'Star 95 Mask' were manufactured. Details are as follows:

Direct material consumed 5,700 meters @ ₹58 per meter	
Direct labour Hours? @ ?	₹2,24,400
Variable overhead incurred	₹1,12,200

Variable overhead efficiency variance is ₹ 2,000 A. Variable overheads are based on Direct Labour Hours.

You are required to calculate the missing data and all the relevant Variances.

Answer

1. Material Variances:

Material Cost Variance	=	(SQ × SP) – (AQ × AP)	
	=	(10,000 units × 0.5 meter × ₹60) – (5,700 × ₹58)	
	=	***₹30,600 A***	

Material Price Variance	=	(AQ × SP) – (AQ × AP)		
	=	(5,700 × ₹60) – (5,700 × ₹58)	=	***₹11,400 F***
Material Usage Variance	=	(SQ × SP) – (AQ × SP)		
	=	(10,000 units × 0.5 meter × ₹60) - (5,700 × ₹60)		
	=	***₹42,000 A***		

2. Variable Overheads Variances:

Variable OH Cost variance	=	(SH × SR) - (AH × AR)		
	=	(10,000 × 1 hour × ₹10) – ₹1,12,200	=	***₹12,200 A***
Variable OH Eff. Variance	=	(SH × SR) - (AH × SR)		
₹2,000 A	=	(10,000 × 1 hour × ₹10) - (AH × ₹10)		
₹2,000 A	=	₹1,00,000 – 10 AH		
Actual Hours	=	₹1,02,000 ÷ ₹10	=	***10,200 hours***
Variable OH Exp. Variance	=	(AH × SR) - (AH × AR)		
	=	(10,200 × ₹10) - ₹1,12,200	=	***10,200 A***

3. Labour Variances:

Labour Rate Variance	=	(AH × SR) – (AH × AR)		
	=	(10,200 hours × ₹20) – ₹2,24,400	=	***₹20,400 A***
Labour Efficiency Variance	=	(SH × SR) – (AH × SR)		
	=	(10,000 units × 1 hour × ₹20) – (10,200 hours × ₹20)		
	=	***₹4,000 A***		
Labour Cost Variance	=	(SH × SR) – (AH × AR)		
	=	(10,000 units × 1 hour × ₹20) – ₹2,24,400		
	=	***₹24,400 A***		
Actual Labour rate	=	Actual Labour Cost ÷ AH		
	=	₹2,24,400 ÷ 10,200 hours	=	***₹22***

BUDGET RELATED

BQ 32

TQM Ltd. has furnished the following information for the month ending 30th June, 2007:

	Master Budget	***Actual***	***Variance***
Units produced and sold	***80,000***	***72,000***	
Sales (₹)	***3,20,000***	***2,80,000***	40,000 (A)
Direct material (₹)	80,000	73,600	6,400 (F)
Direct wages (₹)	1,20,000	1,04,800	15,200 (F)
Variable overhead (₹)	40,000	37,600	2,400 (F)
Fixed overhead (₹)	40,000	39,200	800 (F)
Total Cost	***2,80,000***	***2,55,200***	

The Standard costs of the products are as follows:

Direct materials	(1 kg at the rate of ₹1 per kg)	₹1.00

Direct wages	(1 hour at the rate of ₹1.50)	₹1.50
Variable overhead	(1 hour at the rate of ₹0.50)	₹0.50

Actual results for the month showed that 78,400 kg of material were used and 70,400 labour hours were recorded.

Required:

(i) Prepare Flexible budget for the month and compare with actual results.

(ii) Calculate Material, Labour, Sales Price, Variable overhead and Fixed overhead expenditure variances and Sales Volume (Profit) variance.

Answer

(i) Flexible Budget

Particulars	***Budget for 72,000 units***	***Actual for 72,000 units***	***Difference***
Direct Materials	72,000	73,600	1,600 A
Direct Labour	1,08,000	1,04,800	3,200 F
Variable OH	36,000	37,600	1,600 A
Fixed OH	40,000	39,200	800 F
Total cost	2,56,000	2,55,200	800 F
Sales	2,88,000	2,80,000	8,000 A
Profit	***32,000***	***24,800***	***7,200 A***

(ii) Calculation of Various Variance:

(a) Material Variance :

Material Price Variance = (AQ × SP) - (AQ × AP)
= (78,400 kg × ₹1.00) – 73,600 (given) = ***4,800 F***

Material Usage Variance = (SQ × SP) - (AQ × SP)
= (72,000 kg × ₹1.00) – (78,400 kg × ₹1.00) = ***6,400 A***

Material Cost Variance = (SQ × SP) – (AQ × AP)
= 72,000 - 73,600 = ***1,600 A***

(b) Labour Variance :

Labour Rate Variance = (AH × SR) – (AH × AR)
= (70,400 hours × ₹1.5) - 1,04,800 (given) = ***800 F***

Labour Efficiency Variance = (SH × SR) – (AH × SR)
= (72,000 hours × ₹1.5) – (70,400 hours × ₹1.5) = ***2,400 F***

Labour Cost Variance = (SH × SR) – (AH × AR)
= (72,000 hours × ₹1.5) - 1,04,800 = ***3,200 F***

(c) Overhead Expenditure Variance :

Variable OH Exp. Variance = (AH × SR) – (AH × AR)
= (70,400 hours × ₹0.50) – 37,600 (given) = ***2,400 A***

Fixed OH Exp. Variance = Budgeted Fixed OH – Actual Fixed OH
= 40,000 - 39,200 (given) = ***800 F***

(d) Sales Variance :

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

	=	(72,000 units × ₹4) – 2,80,000(given)	= ***8,000 A***
Sales Vol. (Profit) Variance	=	Standard Profit per unit (BQ – AQ)	
	=	₹0.50 × (80,000 – 72,000)	= ***4,000 A***

BQ 33

Following data is available for DKG and Co:

Standard working hours	8 hours per day of 5 days per week
Maximum capacity	50 employees
Actual working	40 employees
Actual hours expected to be worked per four week	6,400 hours
Standard hours expected to be earned per four weeks	8,000 hours
Actual hours worked in the four week period	6,000 hours
Standard hours earned in the four week period	7,000 hours.

The related period is of 4 weeks. In this period there was a one special day holiday due to national event.

Calculate:

(1) Efficiency Ratio,
(2) Activity Ratio,
(3) Calendar Ratio,
(4) Standard Capacity Usage Ratio,
(5) Actual Capacity Usage Ratio,
(6) Actual Usage of Budgeted Capacity Ratio.

Answer

Maximum Capacity in a budget period = 50 Employees × 8 Hours × 5 Days × 4 Weeks = ***8,000 Hours***

Budgeted Hours = 40 Employees × 8 Hours × 5 Days × 4 Weeks = ***6,400 Hours***

Actual Hours = ***6,000 Hours (given)***

Standard Hours for Actual Output = ***7,000 Hours***

Budget Number of Days = ***20 Days (4 Weeks x 5 Days)***

Actual Number of Days = 20 – 1 = ***19 Days***

(1) Efficiency Ratio $= \frac{\text{Standard Hours}}{\text{Actual Hours}} \times 100 = \frac{7{,}000 \text{ Hours}}{6{,}000 \text{ Hours}} \times 100$

$= $ ***116.67%***

(2) Activity Ratio $= \frac{\text{Standard Hours}}{\text{Budgeted Hours}} \times 100 = \frac{7{,}000 \text{ Hours}}{6{,}400 \text{ Hours}} \times 100$

$= $ ***109.375%***

(3) Calendar Ratio $= \frac{\text{Available Working Days}}{\text{Budgeted Working Days}} = \frac{19 \text{ Days}}{20 \text{ Days}}$

$= $ ***95%***

(4) Standard Capacity Usage Ratio $= \frac{\text{Budgeted Hours}}{\text{Max. Possible Hours in Budget Period}} \times 100$

$= \frac{6{,}400 \text{ Hours}}{8{,}000 \text{ Hours}} \times 100 = \mathbf{80\%}$

(5) Actual Capacity Usage Ratio $= \frac{\text{Actual Hours Worked}}{\text{Max. Possible Working Hours in a Period}} \times 100$

$= \frac{6{,}000 \text{ Hours}}{8{,}000 \text{ Hours}} \times 100 = \mathbf{75\%}$

(6) Actual Usage of Budgeted Capacity Ratio

$= \frac{\text{Actual Working Hours}}{\text{Budgeted Hours}} \times 100$

$= \frac{6{,}000 \text{ Hours}}{6{,}400 \text{ Hours}} \times 100 = \mathbf{93.75\%}$

PAST YEAR QUESTIONS

PYQ 1

SJ Ltd. has furnished the following information:

Standard overhead absorption rate per unit	₹20
Standard rate per hour	₹4
Budgeted production	12,000 units
Actual production	15,560 units
Actual overheads were	₹2,95,000 (₹62,500 fixed)
Actual hours	74,000

Overheads are based on the following flexible budget:

Production (units)	8,000	10,000	14,000
Total Overheads (₹)	1,80,000	2,10,000	2,70,000

You are required to calculate the following overhead variances (on hour's basis) with appropriate workings:

(i) Variable overhead efficiency and expenditure variance.
(ii) Fixed overhead efficiency and capacity variance.

[(8 Marks) May 2012/2015]

Answer

(i) Variable Overhead Efficiency = (SH × SR) - (AH × SR)
= 2,33,400 - 2,22,000 = ***11,400 F***

Variable Expenditure Variable = (AH × SR) - (AH × AR)
= 2,22,000 - 2,35,500 = ***10,500 A***

(ii) Fixed Overhead Efficiency = (SH × SR) - (AH × SR)
= 77,800 – 74,000 = ***3,800 F***

Fixed OH Capacity Variance = (AH × SR) - (BH × SR)
= 74,000 - 60,000 = ***14,000 F***

Working Notes:

For variable overheads:

SH × SR = 15,560 units × 5 hours per unit × ₹3 per hour
= ***2,33,400***

AH × SR = 74,000 hours × ₹3 per hour = ***2,22,000***

AH × AR = 2,95,000 - 62,500 = ***2,32,500***

For fixed overheads:

SH × SR = 15,560 units × 5 hours × ₹1 per hour = ***77,800***

AH × SR = 74,000 × ₹1 per hour = ***74,000***

BH × BR = 12,000 units × 5 hours per unit × ₹1 per hour
= ***60,000***

Standard OH (variable + fixed) = ***₹20 per unit***

Standard hours per unit = $\frac{\text{Standard overhead per unit}}{\text{Standard rate per hour}}$ = $\frac{20.00}{4.00}$

= ***5 hours per unit***

Budgeted variable cost per unit = $\frac{\text{Difference in expense}}{\text{Difference in units}}$ = $\frac{2,10,000 - 1,80,000}{10,000 - 8,000}$

= ***₹15.00 per unit***

Standard variable overhead per hour = $\frac{15.00}{5 \text{ hours}}$ = ***₹3 per hour***

Standard fixed overhead per hour = Total Standard OH per hour – Standard Variable OH per hour

= 4.00 - 3.00 = ***₹1 per hour***

PYQ 2

XYZ Co. Ltd. provides the following information:

Particulars	***Standard***	***Actual***
Production in units	4,000	3,800
Working Days	20	21
Fixed Overhead	₹40,000	₹39,000
Variable Overhead	₹12,000	₹12,000

You are required to calculate the following overhead variance:

(a) Variable Overhead Variance
(b) Fixed Overheads Variances
- ***(i)*** Expenditure Variance
- ***(ii)*** Volume Variance

[(8 Marks) May 2014]

Answer

(a) Variable Overhead Variance = Standard Variable OH for 3,800 units – Actual Variable OH

= (Actual production × SR) – 12,000

= (3,800 units × 3) – 12,000 = ***600 A***

(b) Fixed Overhead Variances:

(i) Expenditure Variance = Budgeted Fixed OH – Actual Fixed OH

= 40,000 – 39,000 = ***1,000 F***

(ii) Volume Variance = (Actual Production - Budgeted Production) × SR

= (3,800 – 4,000) × 10 = ***2,000 A***

Working Notes:

1. Standard rate of Variable OH = $\frac{\text{Budgeted Variable OH}}{\text{Budgeted Production}} = \frac{12,000}{4,000 \text{ Units}}$ = ***₹3 p.u.***

2. Standard rate of Fixed OH = $\frac{\text{Budgeted Fixed OH}}{\text{Budgeted Production}} = \frac{40,000}{4,000 \text{ Units}}$ = ***₹10 p.u.***

PYQ 3

The following information has been provided by a company:

No of units produced and sold	6,000 units
Standard labour rate per hour	₹8
Standard hours required for 6,000 units	?
Actual hours required	17,094 hours
Labour efficiency	105.3%
Labour rate variance	₹68,376 A

You are required to calculate:

(i) Actual labour rate per hour
(ii) Standard hours required for 6,000 units
(iii) Labour efficiency variance
(iv) Standard labour cost per unit
(v) Actual labour cost per unit

[(8 Marks) June 2015]

Answer

(i) Actual labour rate per hour:

Labour rate variance	=	(AH × SR) - (AH × AR)	=	68,376 A
	=	(17,094 × 8) – (17,094 × AR)	=	68,376 A
17,094 AH	=	1,36,752 + 68,376		
AH	=	2,05,128 ÷ 17,094	=	***₹12 per hour***

(ii) Standard hours required for 6,000 units

Labour efficiency ratio	=	SH ÷ AH		
105.3%	=	SH ÷ 17,094		
SH	=	17,094 × 105.3%	=	***18,000 hours***

(iii) Labour efficiency variance:

Labour efficiency variance	=	(SH × SR) - (AH × SH)		
	=	(18,000 × 8) – (17,094 × 8)	=	***7,248 F***

(iv) Standard labour cost per unit:

Standard labour cost per unit	=	(SH × SR) ÷ No of units		
	=	(18,000 × 8) ÷ 6,000 units	=	***₹24 per unit***

(v) Standard labour cost per unit:

Actual labour cost per unit	=	(AH × AR) ÷ No of units		
	=	(17,094 × 12) ÷ 6,000 units	=	***₹34.188/unit***

PYQ 4

The following information available from the cost records of a company for the month of July' 2016:

(1)	Materials purchased	22,000 pieces	₹90,000
(2)	Materials consumed	21,000 pieces	
(3)	Actual wages paid for	5,150 hours	₹25,750
(4)	Fixed Factory overhead incurred		₹46,000
(5)	Fixed Factory overhead budgeted		₹42,000
(6)	Units produced		1,900
(7)	Standard rates and prices are:		
	Direct material	₹4.50 per piece	
	Standard input	10 pieces per unit	

Direct labour rate	₹6 per hour
Standard requirement	2.5 hour per unit
Overheads	₹8 per labour hour

You are required to calculate the following variances:

(a) Material price variance
(b) Material usage variance
(c) Labour rate variance
(d) Labour efficiency variance
(e) Fixed overhead expenditure variance
(f) Fixed overhead efficiency variance
(g) Fixed overhead capacity variance.

[(8 Marks) Nov 2016]

Answer

(a) ***Material Price Variance*** = (AQ purchased × SP) – (AQ purchased × AP)
(based on purchase/single plan) = (22,000 × ₹4.5) – ₹90,000 = ***9,000 F***

(b) ***Material Usage Variance*** = (SQ × SP) - (AQ × SP)
= (1,900 × 10 × ₹4.5) - (21,000 × ₹4.5)
= ₹85,500 – ₹94,500 = ***9,000 A***

(c) ***Labour Rate Variance*** = (AH × SR) – (AH × AR)
= (5,150 × ₹6) - ₹25,750 = ***5,150 F***

(d) ***Labour Efficiency Variance*** = (SH × SR) – (AH × SR)
= (1,900 × 2.5 × ₹6) - (5,150 × ₹6) = ***2,400 A***

(e) ***Fixed OH Expenditure Variance*** = Budgeted Fixed OH – Actual Fixed OH
= ₹42,000 – ₹46,000 = ***4,000 A***

(f) ***Fixed OH Efficiency Variance*** = (SH × SR) – (AH × SR)
= (1,900 × 2.5 × ₹8) – (5,150 × ₹8)= ***3,200 A***

(g) ***Fixed OH Capacity Variance*** = (AH × SR) – (BH × SR)
= (5,150 × ₹8) – ₹42,000 = ***800 A***

PYQ 5

AB Ltd. has furnished the following data:

Particulars	***Budget***	***Actual, July'16***
No. of working days	25	27
Production in units	20,000	22,000
Fixed Overheads (₹)	30,000	31,000

Budgeted fixed overhead rate is ₹1.00 per hour. In July'16, the actual hours worked were 31,500.

Calculate the following variances in relation to fixed overheads:

(a) Efficiency Variance ***(b)*** Capacity Variance ***(c)*** Calendar Variance
(d) Volume Variance ***(e)*** Expenditure Variance.

[(5 Marks) May 2017]

Answer

(a)	**Fixed OH Efficiency Variance**	=	(SH × SR) – (AH × SR)		
		=	(33,000 × ₹1) – (31,500 × ₹1)	=	**1,500 F**
(b)	**Fixed OH Capacity Variance**	=	(AH × SR) – (CH × SR)		
		=	(31,500 × ₹1) – (32,400 × ₹1)	=	**900 A**
(c)	**Fixed OH Calendar Variance**	=	(CH × SR) – (BH × SR)		
		=	(32,400 × ₹1) – ₹30,000	=	**2,400 F**
(d)	**Fixed OH Volume Variance**	=	(SH × SR) – (BH × SR)		
		=	(33,000 × ₹1) – ₹30,000	=	**3,000 F**
(e)	**Fixed OH Expenditure Variance**	=	(BH × SR) – (AH × AR)		
		=	₹30,000 – ₹31,000	=	**1,000 A**

Working notes:

Budgeted hours (BH)	=	₹30,000 ÷ ₹1 per hour	=	30,000 hours
Standard hour per unit	=	30,000 hours ÷ 20,000 units	=	1.5 hour
Standard hour for actual output (SH)	=	22,000 units × 1.5 hours	=	33,000 hours
Calendar hours (CH)	=	(30,000 hours × $^{27}/_{25}$ days)	=	32,400 hours

PYQ 6

XYZ Limited produces an article and uses a mixture of material X and Y. The standard quantity and price of materials for one unit of output as under:

Materials	Quantity	Price (₹)
X	2,000 kg	1.00 per kg
Y	800 kg	1.50 per kg

During a period, 1,500 units were produced. The actual consumption of materials and prices are given below:

Materials	Quantity	Price (₹)
X	31,00,000 kg	1.10 per kg
Y	12,50,000 kg	1.60 per kg

Calculate:

(1) Standard cost for actual output;
(2) Material Cost Variance;
(3) Material Price Variance;
(4) Material Usage Variance.

[(8 Marks) Nov 2017]

Answer

(1)	Standard cost for actual output	=	Std. cost of materials X and Y for 1,500 units of output		
		=	SQ × SP	=	**₹48,00,000**
(2)	Material Cost Variance	=	(SQ × SP) – (AQ × AP)		
		=	₹48,00,000 – ₹54,10,000	=	**₹6,10,000 A**
(3)	Material Price Variance	=	(AQ × SP) – (AQ × AP)		
		=	₹49,75,000 - ₹54,10,000	=	**₹4,35,000 A**
(4)	Material Usage Variance	=	(SQ × SP) – (AQ × SP)		

= ₹48,00,000 – ₹49,75,000 = ***₹1,75,000 A***

Working notes:

1. Basic calculation

Materials	*SQ × SP*	*RQ × SP*	*AQ × SP*	*AQ × AP*
X	30,00,000 × ₹1.00	31,07,143 × ₹1.00	31,00,000 × ₹1.00	31,00,000 × ₹1.10
Y	12,00,000 × ₹1.50	12,42,857 × ₹1.50	12,50,000 × ₹1.50	12,50,000 × ₹1.60
Total	₹48,00,000	₹49,71,429	₹49,75,000	₹54,10,000

2. SQ of input for actual output:

Materials X = 1,500 units × 2,000 kg = 30,00,000 kgs
Materials Y = 1,500 units × 800 kg = 12,00,000 kgs

3. RQ (Revised Quantity) of actual input:

Materials X = (31,00,000 + 12,50,000) × 20/28 = 31,07,143 kgs
Materials Y = (31,00,000 + 12,50,000) × 8/28 = 12,42,857 kgs

PYQ 7

A company planned to produce 2,000 units of a product in a week of 40 hours by employing 65 skilled workers. Other relevant information are as follows:

- Standard wage rate : ₹45 per hour
- Actual production : 1,800 units
- Actual number of workers employed : 50 workers in a week of 40 hours
- Actual wage rate : ₹50 per hour
- Abnormal time loss : due to machine breakdown 100 hours

You are required to calculate:

(1) Labour cost, rate, idle time and efficiency variances.
(2) Reconcile the variances.

[(5 Marks) May 2018]

Answer

(1) ***Labour Cost Variance*** = (SH × SR) – (AH × AR)

$= \frac{65 \times 40}{2,000} \times 1,800 \times ₹45 - (50 \times 40 \times ₹50) =$ ***5,300 F***

Labour Rate Variance = (AH × SR) – (AH × AR)
= (50 × 40 × ₹45) - (50 × 40 × ₹50) = ***10,000 A***

Labour Efficiency Variance = (SH × SR) – (AHW × SR)
= (2,340 × ₹45) - (1,900 × ₹45) = ***19,800 F***

Labour Idle Time Variance = (AHW × SR) – (AH × SR)
= (1,900 × ₹45) - (2,000 × ₹45) = ***4,500 A***

(2) ***Reconciliation:***

Labour Cost Variance = LRV + LEV + Idle time variance
= 10,000 A + 19,800 F + 4,500 A = ***5,300 F***

PYQ 8

Beta ltd. is manufacture Product N. This is manufactured by mixing two materials namely Material P and Material Q. The standard cost of mixture is as under:

Material P	:	150 ltrs. @ ₹40 per ltr.
Material Q	:	100 ltrs. @ ₹60 per ltr.
Standard loss expected	:	20% of total input during production

The cost records for the period exhibit following consumption:

Material P	:	140 ltrs. @ ₹42 per ltr.
Material Q	:	110 ltrs. @ ₹56 per ltr.
Quantity produced	:	195 ltrs.

Calculate:

(1) Material Cost Variance
(2) Material Usage Variance
(3) Material Price Variance

[(5 Marks) May 2018]

Answer

(1) Material Cost Variance = (SQ × SP) – (AQ × AP)
= ₹11,700 – ₹12,040 = ***340 A***

(2) Material Usage Variance = (SQ × SP) - (AQ × SP)
= ₹11,700 – ₹12,200 = ***500 A***

(3) Material Price Variance = (AQ × SP) – (AQ × AP)
= ₹12,200 – ₹12,040 = ***160 F***

Working notes:

Analysis Table

Materials	SQ × SP	AQ × SP	AQ × AP
P	146.25 ltrs. × ₹40	140 ltrs. × ₹40	140 ltrs. × ₹42
Q	97.50 ltrs. × ₹60	110 ltrs. × ₹60	110 ltrs. × ₹56
Total	₹11,700	₹12,200	₹12,040

(a) SQ of input for actual output

Total input	=	195 ltrs. ÷ 80%	=	243.75 ltrs.
Materials P	=	243.75 ltrs. × $^{150}/_{250}$	=	146.25 ltrs.
Materials Q	=	243.75 ltrs. × $^{100}/_{250}$	=	97.50 ltrs.

PYQ 9

A manufacturing concern has provided following information related to fixed overheads:

Particulars	Standard	Actual
Output in a month	5,000	4,800
Working days in a month	25	23
Fixed Overhead	₹5,00,000	₹4,90,000

Compute:

(1) Fixed Overheads Variance
(2) Fixed Overheads Expenditure Variance
(3) Fixed Overheads Volume Variance
(4) Fixed Overheads Efficiency Variance ***[(5 Marks) Nov 2018]***

Answer

(1) Fixed Overhead Variance = Standard Fixed OH – Actual Fixed OH

= $\frac{5,00,000}{5,000} \times 4,800 - ₹4,90,000$ = ***10,000 A***

(2) Fixed OH Expenditure Variance= Budgeted Fixed OH – Actual Fixed OH

= ₹5,00,000 – ₹4,90,000 = ***10,000 F***

(3) Fixed OH Volume Variance = Standard Fixed OH – Budgeted Fixed OH

= ₹4,80,000 – ₹5,00,000 = ***20,000 A***

(4) Fixed OH Efficiency Variance = Standard Fixed OH – Standard Fixed OH for AH

= SH × SR – AH × SR

= ₹4,80,000 – $\frac{5,00,000}{25 \text{ Days}} \times 23 \text{ Days}$ = ***20,000 F***

Note: In the absence of actual hours, we used calendar hours as actual hours in above solution.

PYQ 10

Following data is available for ABC Ltd:

Standard working hours	8 hours per day of 5 days per week
Maximum capacity	60 employees
Actual working	50 employees
Actual hours expected to be worked per four week	8,000 hours
Standard hours expected to be earned per four weeks	9,600 hours
Actual hours worked in the four week period	7,500 hours
Standard hours earned in the four week period	8,800 hours.

The related period is of 4 weeks.

Calculate the following ratios:

(1) Efficiency Ratio,
(2) Activity Ratio,
(3) Standard Capacity Usage Ratio,
(4) Actual Capacity Usage Ratio,
(5) Actual Usage of Budgeted Capacity Ratio. ***[(5 Marks) May 2019]***

Answer

Maximum Capacity in a budget period = 60 Employees × 8 Hours × 5 Days × 4 Weeks

= 9,600 Hours

Budgeted Hours = 50 Employees × 8 Hours × 5 Days × 4 Weeks

= 8,000 Hours

Actual Hours = 7,500 Hours (given)

Standard Hours for Actual Output = 8,800 Hours

(1) ***Efficiency Ratio*** = $\frac{\text{Standard Hours}}{\text{Actual Hours}} \times 100 = \frac{8,800 \text{ Hours}}{7,500 \text{ Hours}} \times 100$

= ***117.33%***

(2) ***Activity Ratio*** = $\frac{\text{Standard Hours}}{\text{Budgeted Hours}} \times 100 = \frac{8,800 \text{ Hours}}{8,000 \text{ Hours}} \times 100$

= ***110.00%***

(3) Standard Capacity Usage Ratio = $\frac{\text{Budgeted Hours}}{\text{Max. Possible Hours in Budget Period}} \times 100$

= $\frac{8{,}000 \text{ Hours}}{9{,}600 \text{ Hours}} \times 100$ = ***83.33%***

(4) Actual Capacity Usage Ratio = $\frac{\text{Actual Hours Worked}}{\text{Max. Possible Working Hours in a Period}} \times 100$

= $\frac{7{,}500 \text{ Hours}}{9{,}600 \text{ Hours}} \times 100$ = ***78.125%***

(5) Actual Usage of Bgt Capacity Ratio = $\frac{\text{Actual Working Hours}}{\text{Budgeted Hours}} \times 100$

= $\frac{7{,}500 \text{ Hours}}{8{,}000 \text{ Hours}} \times 100$ = ***93.75%***

PYQ 11

The standard cost of a chemical mixture is as follows:

60% of Material A @ ₹50 per kg
40% of Material B @ ₹60 per kg

A standard loss of 25% on output is expected in production. The cost records for a period has shown the following usage:

540 kg of Material A @ ₹60 per kg
260 kg of Material B @ ₹50 per kg

The quantity processed was 680 kilograms of good product.

From the above given information calculate:

(1) Material Cost Variance
(2) Material Price Variance
(3) Material Usage Variance
(4) Material Mix Variance
(5) Material Yield Variance

[(10 Marks) Nov 2019]

Answer

(1) Material Cost Variance = (SQ × SP) – (AQ × AP)
= ₹45,900 – ₹45,400 = ***₹500 F***

(2) Material Price Variance = (AQ × SP) – (AQ × AP)
= ₹42,600 - ₹45,400 = ***₹2,800 A***

(3) Material Usage Variance = (SQ × SP) – (AQ × SP)
= ₹45,900 – ₹42,600 = ***₹3,300 F***

(4) Material Mix Variance = (RSQ × SP) – (AQ × SP)
= ₹43,200 – ₹42,600 = ***₹600 F***

(5) Material Yield Variance = (SQ × SP) – (RSQ × SP)
= ₹45,900 – ₹43,200 = ***₹2,700 F***

Working notes:

a. Basic Calculation

Materials	SQ × SP	RSQ × SP	AQ × SP	AQ × AP
A	510 × ₹50	480 × ₹50	540 × ₹50	540 × ₹60
B	340 × ₹60	320 × ₹60	260 × ₹60	260 × ₹50
Total	₹45,900	₹43,200	₹42,600	₹45,400

b. SQ of input for actual output:

Input – Loss	=	Output		
Input – 25% Output	=	Output		
Input	=	125% Output		
Input of Raw Material	=	125% × 680 kgs of Good Product	=	850 kgs
Materials A	=	850 kgs × 60%	=	510 kgs
Materials B	=	850 kgs × 40%	=	340 kgs

c. RSQ (Revised Standard Quantity)of actual input:

Materials A	=	800 kgs × 60%	=	480 kgs
Materials B	=	800 kgs × 40%	=	320 kgs

PYQ 12

ABC Ltd. has furnished the following information regarding the overheads for the month of June, 2020:

(i)	Fixed Overhead Cost Variance	₹2,800 (Adverse)
(ii)	Fixed Overhead Volume Variance	₹2,000 (Adverse)
(iii)	Budgeted Hours for June, 2020	2,400 hours
(iv)	Budgeted Overheads for June, 2020	₹12,000
(v)	Actual rate of recovery of overheads	₹8 per hour

From the given information calculate:

(1) Fixed Overhead Expenditure Variance
(2) Actual Overheads Incurred
(3) Actual Hours for Actual Production
(4) Fixed Overhead Capacity Variance
(5) Standard Hours for Actual Production
(6) Fixed Overhead Efficiency Variance

[(10 Marks) Nov 2020]

Answer

(1) Fixed OH Expenditure Variance = Fixed OH Cost Variance – Fixed OH Volume Variance
= ₹2,800 A – ₹2,000 A = ***₹800 A***

(2) Fixed OH Expenditure Variance = Budgeted Fixed OH - Actual Fixed OH
₹800 A = ₹12,000 - Actual Fixed OH
Actual Overheads incurred = ₹12,000 + ₹800 = ***₹12,800***

(3) Actual Hours for Actual Production:

Actual Overheads Incurred	=	AH × AR =	AH × ₹8=	₹12,800
Actual Hours (AH)	=	₹12,800 ÷ ₹8	=	***1,600***

(4) Fixed OH Capacity Variance = AH × SR – BH × SR
= 1,600 × ₹5 – ₹12,000 = ***4,000 A***

(5) Standard Hours for Actual Production:

Fixed OH Volume Variance	=	SH × SR – BH × SR		
	=	SH × ₹5 – ₹12,000	=	₹2,000 A
SH × ₹5	=	₹2,000 A + ₹12,000	=	₹10,000
SH for Actual Production	=	₹10,000 ÷ ₹5	=	***2,000***

(6) Fixed OH Efficiency Variance = SH × SR – AH × AR
= 2,000 × ₹5 – 1,600 × ₹5 = ***2,000 F***

Working Note:

(a) Standard Rate (SR) = Budgeted OH ÷ Budgeted Hours
= ₹12,000 ÷ 2,400 = ***₹5/hour***

PYQ 13

Premier Industries has a small factory where 52 workers are employed on an average for 25 days a month and they work 8 hours per day. The normal down time is 15%. The firm has introduced standard costing for cost control. Its monthly budget for November, 2020 shows that the budgeted variable and fixed overhead are ₹1,06,080 and ₹2,21,000 respectively. The firm reports the following details of actual performance for November, 2020, after the end of the month:

Actual hours worked	8,100 hours
Actual production expressed in standard hours	8,800 hours
Actual Variable Overheads	₹1,02,000
Actual Fixed Overheads	₹2,00,000

You are required to calculate:

(1) Variable Overhead Variances:
- ***(a)*** Variable overhead expenditure variance.
- ***(b)*** Variable overhead efficiency variance.

(2) Fixed Overhead Variances:
- ***(a)*** Fixed overhead budget variance.
- ***(b)*** Fixed overhead capacity variance.
- ***(c)*** Fixed overhead efficiency variance.

(3) Control Ratios:
- ***(a)*** Capacity ratio.
- ***(b)*** Efficiency ratio.
- ***(c)*** Activity ratio.

[(10 Marks) Jan 2021]

Answer

(1) Variable Overhead Variances:

(a) Variable OH Exp. Variance = (AH × SR) - (AH × AR)
= (8,100 hours × ₹12) - ₹1,02,000 = ***₹4,800 A***

(b) Variable OH Eff. Variance = (SH – AH) × SR
= (8,800 hours – 8,100 hours) × ₹12 = ***₹8,400 F***

(2) Fixed Overhead Variances:

(a) Fixed OH Budget Variance = Budgeted Overheads - Actual Overheads

= ₹2,21,000 - ₹2,00,000 = ***₹21,000 F***

(b) Fixed OH Capacity Variance = (AH × SR) – (BH × SR)
= (8,100 hours × ₹25) - ₹2,21,000 = ***₹18,500 A***

(c) Fixed OH Efficiency Variance = (SH – AH) × SR
= (8,800 hours – 8,100 hours) × ₹25 = ***₹17,500 F***

(3) Control Ratios:

(a) Capacity Ratio = (Actual Hours ÷ Budgeted Hours) × 100
= (8,100 hours ÷ 8,840 hours) × 100 = ***91.63%***

(b) Efficiency Ratio = (Standard Hours ÷ Actual Hours) × 100
= (8,800 hours ÷ 8,100 hours) × 100 = ***108.64%***

(c) Activity Ratio = (Standard Hours ÷ Budgeted Hours) × 100
= (8,800 hours ÷ 8,840 hours) × 100 = ***99.55%***

Working Notes:

Variable OH Standard Rate (SR) = Budgeted Variable OH ÷ Budgeted Hours
= ₹1,06,080 ÷ 8,840 hours = ***₹12 per hour***

Fixed OH Standard Rate (SR) = Budgeted Fixed OH ÷ Budgeted Hours
= ₹2,21,000 ÷ 8,840 hours = ***₹25 per hour***

Budgeted Hours = (52 workers × 25 Days × 8 Hours) – 15% Normal down time
= ***8,840 hours***

PYQ 14

The standard output of a product 'DJ' is 25 units per hour in manufacturing department of a company employing 100 workers. In a 40 hours week, the department produced 960 units of product 'DJ' despite 5% of the time paid was lost due to an abnormal reason. The hourly wage rates actually paid were ₹6.20, ₹6.00 and ₹5.70 respectively to Group 'A' consisting 10 workers, Group 'B' consisting 30 workers and Group 'C' consisting 60 workers. The standard wage rate per labour is same for all the workers. Labour Efficiency Variance is given ₹240 (F).

You are required to compute:

(1) Total Labour Cost Variance,
(2) Total Labour Rate Variance,
(3) Total Labour Gang variance,
(4) Total Labour Yield Variance, and
(5) Total Labour Idle Time Variance. ***[(10 Marks) July 2021]***

Answer

(1) Labour Cost Variance = (SH × SR) – (AH × AR)
= (3,840 × 6) – 23,360 = ***₹320 A***

(2) Labour Rate Variance = (AH × SR) – (AH × AR)
= (4,000 × 6) – 23,360 = ***₹640 F***

(3) Labour Gang Variance = (RH × SR) – (AHW × SR)

		=	₹22,800 – ₹22,800	=	***Nil***
(4)	Labour Yield Variance	=	(SH × SR) – (RH × SR)		
		=	(3,840 × 6) – ₹22,800	=	***₹240 F***
(5)	Labour Idle Variance	=	(AHW × SR) – (AH × SR)		
		=	₹22,800 – ₹24,000	=	***₹1,200 A***

Working notes:

(a) Basic Calculation

Workers	***SH × SR***	***RSH × SR***	***AHW × SR***	***AH × SR***	***AH × AR***
Group A	384 × 6	380 × 6	380 × 6	10 × 40 × 6.00	10 × 40 × 6.20
Group B	1,152 × 6	1,140 × 6	1,140 × 6	30 × 40 × 6.00	30 × 40 × 6.00
Group C	2,304 × 6	2,280 × 6	2,280 × 6	60 × 40 × 6.00	60 × 40 × 5.70
Total	₹23,040	₹22,800	₹22,800	₹24,000	₹23,360

(b) RSH (Revised Standard Hours) and AHW (Actual Hours Worked):

	Total Actual Hours Worked	=	(100 workers × 40 hours) – 5% abnormal idle time		
		=	3,800 hours		
	Group A	=	3,800 × 10/100	=	380 hours
	Group B	=	3,800 × 30/100	=	1,140 hours
	Group C	=	3,800 × 60/100	=	2,280 hours

(c) SH (Standard hours) for actual output 1,920 units:

	Total standard hours	=	(100 workers × 1 hour ÷ 25 units) × 960 units		
		=	3,840 hours		
	Group A	=	3,840 × 10/100	=	384 hours
	Group B	=	3,840 × 30/100	=	1,152 hours
	Group C	=	3,840 × 60/100	=	2,304 hours

(d) Standard wages rate (SR):

	Labour Efficiency Variance	=	(SH - AHW) × SR		
	240 F	=	(3,840 – 3,800) × SR		
	SR	=	240 ÷ 40	=	₹6 per hour

PYQ 15

In a manufacturing company the standard units of production for the year were fixed at 1,20,000 units and overhead expenditures were estimated to be as follows:

	₹
Fixed	12,00,000
Semi-variable (60% expenses are of fixed nature and 40% are of variable nature)	1,80,000
Variable	6,00,000

Actual production during the month of April, 2021 was 8,000 units. Each month has 20 working days. During the month there was one public holiday. The actual overheads were as follows:

	₹
Fixed	1,10,000
Semi-variable (60% expenses are of fixed nature and 40% are of variable nature)	19,200
Variable	48,000

You are required to calculate the following variances for the month of April 2021:

1. Overhead Cost variance
2. Fixed Overhead Cost variance
3. Variable Overhead Cost variance
4. Fixed Overhead Volume variance
5. Fixed Overhead Expenditure Variance
6. Calendar Variance

[(10 Marks) Dec 2021]

Answer

1.	***Overheads Cost Variance***	=	Standard OH for 8,000 units – Actual OH		
		=	8,000 units × (10.9 + 5.6) – (1,10,000 + 19,200 + 48,000)		
		=	1,32,000 - 1,77,200	=	***45,200 A***
2.	***Fixed Overhead Cost Variance***	=	Standard Fixed OH – Actual Fixed OH		
		=	8,000 units × 10.9 – 1,2,1520		
		=	87,200 – 1,21,520	=	***34,320 A***
3.	***Variable OH Cost Variance***	=	Standard Variable OH – Actual Variable OH		
		=	8,000 units × 5.6 – 55,680		
		=	44,800 – 55,680	=	***10,880 A***
4.	***Fixed OH Volume Variance***	=	Standard Fixed OH – Budgeted Fixed OH		
		=	8,000 units × 10.9 – 1,09,000		
		=	87,200 – 1,09,000	=	***21,800 A***
5.	***Fixed OH Exp Variance***	=	Budgeted Fixed OH – Actual Fixed OH		
		=	1,09,000 – 1,2,1520	=	***12,520 A***
6.	***Calendar Variance***	=	Standard Fixed OH for 19 days – Budgeted Fixed OH		
		=	1,09,000 × 19/20 – 1,09,000		
		=	1,03,550 – 1,09,000	=	***5,450 A***

Working notes:

Total Budgeted Fixed OH per annum	=	₹12,00,000 + 60% × ₹1,80,000	=	₹13,08,000
Total Budgeted Fixed OH per month	=	₹13,08,000 ÷ 12	=	₹1,09,000
Total Budgeted Variable OH per annum	=	₹6,00,000 + 40% × ₹1,80,000	=	₹6,72,000
Total Actual Fixed OH per month	=	₹1,10,000 + 60% × ₹19,200	=	₹1,21,520
Total Actual Variable OH per month	=	₹48,000 + 40% × ₹19,200	=	₹55,680
Standard Fixed OH rate	=	Budgeted Fixed OH ÷ Budgeted Units		
	=	₹13,08,000 ÷ 1,20,000 units	=	₹10.9 per unit
Standard Variable OH rate	=	Budgeted Variable OH ÷ Budgeted Units		
	=	₹6,72,000 ÷ 1,20,000 units	=	₹5.6 per unit

PYQ 16

A manufacturing department of a company has employed 120 workers. The standard output of product ''NPX" is 20 units per hour and the standard wage rate is ₹25 per labour hour.

In a 48 hours week, the department produced 1,000 units of 'NPX' despite 5% of the time paid being lost due to an abnormal reason. The hourly wages actually paid were ₹25.70 per hour.

Calculate:

(a) Labour Cost Variance
(b) Labour Rate Variance
(c) Labour Efficiency Variance
(d) Labour Idle time Variance

[(5 Marks) May 2022]

Answer

(a) Labour Cost Variance = (SH × SR) – (AH × AR)
= ₹1,50,000 - ₹1,48,032 = ***₹1,968 F***

(b) Labour Rate Variance = (AH × SR) – (AH × AR)
= ₹1,44,000 – ₹1,48,032 = ***₹4,032 A***

(c) Labour Efficiency Variance = (SH × SR) – (AHW × SR)
= ₹1,50,000 – ₹1,36,800 = ***₹13,200 F***

(d) Labour Idle Variance = (AHW × SR) – (AH × SR)
= ₹1,36,800 – ₹1,44,000 = ***₹7,200 A***

Working notes:

1. Basic Calculation

SH × SR	***AHW × SR***	***AH × SR***	***AH × AR***
1,000 units × 6 hours × ₹25	120 workers × 45.6 hours (48 – 5%) × ₹25	120 workers × 48 hours × ₹25	120 workers × 48 hours × ₹25.70
₹1,50,000	₹1,36,800	₹1,44,000	₹1,48,032

2. Standard hour per unit = (120 workers × 1 hour) ÷ 20 units = 6 hours per unit

PYQ 17

Y Ltd. manufactures "Product M" which requires three types of raw materials – "A", "B" & "C". Following information related to 1st quarter of the F.Y. 2022-23 has been collected from its books of accounts. The standard material input required for 1,000 kg of finished product 'M' are as under:

Material	***Quantity (Kg.)***	***Std. Rate per Kg. (₹)***
A	500	25
B	350	45
C	250	55
	1,100	
Less: Standard Loss	100	
Standard Output	***1,000***	

During the period the company produced 20,000 kgs of product 'M' for which the actual quantity of materials consumed and purchase prices are as under:

Material	***Quantity (Kg.)***	***Purchase price per kg. (₹)***
A	11,000	23
B	7,500	48
C	4,500	60

You are required to calculate:

(a) Material Cost Variance

(b) Material Price Variance for each raw material and Product 'M'
(c) Material Usage Variance for each raw material and product 'M'
(d) Material Yield Variance

Note: Indicate the nature of variance i.e. Favourable or Adverse.

[(10 Marks) Nov 2022]

Answer

1.	Material Cost Variance	=	(SQ × SP) – (AQ × AP)		
		=	₹8,40,000 – ₹8,83,000	=	***₹43,000 A***
2.	Material Price Variance	=	AQ × (SP – AP)		
	Material A	=	11,000 × (25 – 23)	=	***₹22,000 F***
	Material B	=	7,500 × (45 – 48)	=	***₹22,500 A***
	Material C	=	4,500 × (55 – 60)	=	***₹22,500 A***
	Total	=	22,000 F + 22,500 A + 22,500 A	=	***₹23,000 A***
3.	Material Usage Variance	=	SP × (SQ – AQ)		
	Material A	=	25 × (10,000 – 11,000)	=	***₹25,000 A***
	Material B	=	45 × (7,000 – 7,500)	=	***₹22,500 A***
	Material C	=	55 × (5,000 – 4,500)	=	***₹27,500 F***
	Total	=	25,000 A + 22,500 A + 27,500 F	=	***₹20,000 A***
4.	Material Yield Variance	=	(SQ × SP) – (RSQ × SP)		
		=	₹8,40,000 – ₹8,78,170	=	***₹38,170 A***

Working notes:

a. Basic Calculation

Materials	***SQ × SP***	***RSQ × SP***	***AQ × SP***	***AQ × AP***
A	10,000 × ₹25	10,455 × ₹25	11,000 × ₹25	11,000 × ₹23
B	7,000 × ₹45	7,318 × ₹45	7,500 × ₹45	7,500 × ₹48
C	5,000 × ₹55	5,227 × ₹55	4,500 × ₹55	4,500 × ₹60
Total	₹8,40,000	₹8,78,170	₹8,60,000	₹8,83,000

b. SQ of input for actual output:

Materials A	=	500 kgs × 20 times	=	10,000 kgs
Materials B	=	350 kgs × 20 times	=	7,000 kgs
Materials C	=	250 kgs × 20 times	=	5,000 kgs

c. RSQ (Revised Standard Quantity)of actual input:

Materials A	=	23,000 kgs × 500/1,100	=	10,455 kgs
Materials B	=	23,000 kgs × 350/1,100	=	7,318 kgs
Materials C	=	23,000 kgs × 250/1,100	=	5,227 kgs

PYQ 18

NC Limited uses a standard costing system for the manufacturing of its product 'X'. The following information is available for the last week of the month:

- 25,000 kg of raw material were actually purchased for ₹3,12,500. The expected output is 8 units of product 'X' from each one kg of raw material. There is no opening and closing inventories. The material price variance and material cost variance, as per cost records, are ₹12,500 (F) and ₹1800 (A), respectively.

- The standard time to produce a batch of 10 units of product 'X' is 15 minutes. The standard wage rate per labour hour is ₹50. The company employs 125 workers in two categories, skilled and semi-skilled, in a ratio of 60:40. The hourly wages actually paid were ₹50 per hour for skilled workers and ₹40 per hour for semi-skilled workers. The weekly working hours are 40 hours per worker. Standard wage rate is the same for skilled and semi-skilled workers.

- The monthly fixed overheads are budgeted at ₹76,480. Overheads are evenly distributed throughout the month and assume 4 weeks in a month. In the last week of the month, the actual fixed overhead expenses were ₹19,500.

Required:

(a) Calculate the standard price per kg and the standards quantity of raw material.

(b) Calculate the material usage variance, labour cost variance, and labour efficiency variance.

(c) Calculate the fixed overhead cost variance, the fixed overhead expenditure variance and the fixed overhead volume variance.

Note: Indicate the variance of variance i.e favourable or adverse.

[(10 Marks) May 2023]

Answer

(a)

Material Price Variance	=	(AQ × SP) – (AQ × AP)
₹12,500 F	=	25,000 × SP – ₹3,12,500
Standard Price per kg	=	***₹13***
Material Cost Variance	=	(SQ × SP) – (AQ × AP)
₹1,800 A	=	SQ × ₹13 – ₹3,12,500
Standard Quantity of material	=	***23,900 Kgs***

(b)

Material Usage Variance	=	Material Cost Variance – Material Price Variance		
	=	₹1,800 A – ₹12,500 F	=	***₹10,700 A***
Labour Cost Variance	=	(SH × SR) – (AH × AR)		
	=	(4,780 × ₹50) – [(3,000 hours × ₹50) + (2,000 hours × ₹40)]		
	=	***₹9,000 F***		
Labour Efficiency Variance	=	(SH × SR) – (AH × SR)		
	=	(4,780 × ₹50) – (5,000 hours × ₹50)	=	***₹11,000 A***

(c)

Fixed OH Cost Variance	=	(SH × SR) – (AH × SR)		
	=	₹18,279 – ₹19,500	=	***₹1,221 A***
Fixed OH Exp. Variance	=	(BH × SR) – (AH × SR)		
	=	₹19,120 – ₹19,500	=	***₹380 A***
Fixed OH Volume Variance	=	(SH × SR) – (BH × SR)		
	=	₹18,279 – ₹19,120	=	***₹841 A***

Working Notes:

(1)

Actual Quantity Produced	=	23,900 kgs Materials × 8 units per kg
	=	1,91,200 units of Product X

(2)

Standard Hours	=	1,91,200 units × 1.5 minute per unit/60=	4,780 hours

(3)	Actual Hours	=	125 workers × 40 hours	=	5,000 hours
(4)	Actual Hours (Skilled)	=	125 workers × 60% × 40 hours	=	3,000 hours
	Actual Hours (Semi-skilled)	=	125 workers × 40% × 40 hours	=	2,000 hours
(5)	Budgeted Fixed OH (BH × SR)	=	₹76,480 ÷ 4 weeks	=	₹19,120
(6)	Recovered Fixed OH (SH × SR)	=	₹19,120 × 4,780 hours/5,000 hours	=	₹18,279

SUGGESTED REVISION FOR EXAM:

BQ: 5, 6, 7, 8, 9, 10, 11, 12, 16, 17, 19, 22, 24, 28, 30, 32, 33

PYQ: 1, 12, 13, 16, 18

CHAPTER 13 MARGINAL COSTING

CONTRIBUTION, PV RATIO, BEP, MOS AND PROFIT PLANNING

BQ 1

Tata Ltd. had incurred fixed expenses of ₹4,50,000 with sales of ₹15,00,000 and earned a profit of ₹3,00,000 during the first half year. In second half it suffered a loss of ₹1,50,000.

Calculate:

(i) The profit volume ratio, B.E.P. & MOS for the first half year.

(ii) Expected sales volume for second half year assuming that sales price and fixed expenses remains unchanged during the second half year.

(iii) B.E.P. & MOS of the whole year.

[(i) 50%, 9,00,000, 6,00,000; (ii) 6,00,000, 18,00,000, 3,00,000]

BQ 2

A company sells its product at ₹15. In a period, if it produces and sells 8,000 units, it incurs a loss of ₹5 per unit. If the volume is raised to 20,000 units, it earns a profit of ₹4 per unit.

Calculate break-even point both in terms of rupees as well as in units.

[12,000 units, ₹1,80,000]

BQ 3

The ratio of variable cost to sales is 70%. The break - even point occurs at 60% of the capacity sales. Find the capacity sales when fixed costs are ₹90,000. Also compute profit at 75 % of the capacity sales.

[₹5,00,000 ₹22,500]

BQ 4

A company earned a profit of ₹30,000 during the year. If the marginal cost and selling price of a product are ₹8 and ₹10 per unit respectively.

Find out the amount of 'Margin of Safety'.

[₹1,50,000]

BQ 5

A company has made a profit of ₹50,000 during the year. If the selling price and marginal cost (variable cost) of the product are ₹15 and ₹12 per unit respectively.

Find out the amount of margin of safety.

Answer

$$\textit{Marginal of Safety} = \frac{\text{Profit}}{*\text{PV Ratio}} = \frac{50{,}000}{20\ \%} = ₹2{,}50{,}000$$

$$*\textit{P/V Ratio} = \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{15-12}{15} \times 100 = 20\%$$

BQ 6

If Margin of safety of AB Ltd. is ₹2,40,000 (40% of sales) and P/V ratio is 30%.

Calculate its (1) Break-even sales and (2) Amount of profit on sales of ₹9,00,000.

[(1) ₹3,60,000 (2) ₹1,62,000]

BQ 7

You are given the following data:

Year	*Sales*	*Profit*
2022	₹1,20,000	₹8,000
2023	₹1,40,000	₹13,000

Find out:

(i) P/V ratio, ***(ii)*** BEP, ***(iii)*** Profit when sales are ₹1,80,000, ***(iv)*** Sales required earn a profit of ₹12,000, ***(v)*** Margin of safety in year 2023.

[(i) 25% (ii) ₹88,000 (iii) ₹23,000 (iv) ₹1,36,000 (v) ₹52,000]

BQ 8

You are given the following particulars:

(i) Fixed cost ₹1,50,000
(ii) Variable cost ₹15 per unit
(iii) Selling price is ₹30 per unit

Calculate:

(a) Break-even point
(b) Sales to earn a profit of ₹20,000

Answer

(a) Break-even point $= \frac{\text{Fixed cost}}{\text{Contribution per unit}} = \frac{1,50,000}{30-15}$

$=$ ***10,000 Units***

(b) Sales to earn profit of ₹20,000 $= \frac{\text{Fixed cost} + \text{Desired profit}}{*\text{PV ratio}} = \frac{1,50,000 + 20,000}{50\%}$

$=$ ***₹3,40,000***

****PV ratio*** $= \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{15}{30} \times 100$

$=$ ***50%***

BQ 9

If P/V ratio is 60% and the marginal cost of the product is ₹20. What will be the selling price?

Answer

Sales Price $= \frac{\text{Variable Cost Per Unit}}{*\text{Variable Cost Ratio}} = \frac{20}{40\%} =$ ***₹50 per unit***

****Variable Cost Ratio*** $=$ 100 – P/V Ratio $=$ 100 – 60 $=$ ***40%***

BQ 10

1. Ascertain profit, when:

Sales	2,00,000
Fixed Cost	40,000
BEP	1,60,000

2. Ascertain sales, when:

Fixed cost	20,000
Profit	10,000
BEP	40,000

Answer

1. Profit:

BEP Sales × P/V Ratio	=	Fixed Cost	=	₹1,60,000 × P/V ratio	= ₹40,000
P/V ratio	=	₹40,000 ÷ ₹1,60,000			= 25%
Sales × P/V Ratio	=	Fixed Cost + Profit	=	₹2,00,000 × 25%	= ₹50,000
Profit	=	₹50,000 - ₹40,000	=	***₹10,000***	

2. Sales:

BEP Sales × P/V Ratio	=	Fixed Cost	=	₹40,000 × P/V ratio	= ₹20,000
P/V ratio	=	₹20,000 ÷ ₹40,000			= 50%
Sales × P/V Ratio	=	Fixed Cost + Profit	=	₹20,000 + ₹10,000	= ₹30,000
Sales	=	₹30,000 ÷ 50%	=	***₹60,000***	

BQ 11

A company has a PV ratio of 40%. By what percentage must sales be increased to offset 20% reduction in selling price?

Answer

Let current sales be ₹100. Hence,

Particulars	***Current***	***Proposed***
Sales	100	80
Less: Variable cost (60% of sale)	60	60
Contribution	***40***	***20***

In order to maintain the same contribution, the volume of sales should be $= \frac{40}{20} \times 80 =$ ₹160

Thus, if selling price is reduced by 20%, the sales will have to be increased by 60% i.e. from ₹100 to ₹160.

BQ 12

From the following data, calculate cash break-even point in units and in value:

Selling price per unit	₹10
Variable cost per unit	₹6
Fixed cost (including ₹3,000 as depreciation)	₹10,000

[1,750 units and ₹17,500]

BQ 13

MNP Ltd. sold 2,75,000 units of its product at ₹37.50 per unit. Variable costs are ₹17.50 per unit (manufacturing costs of ₹14 and selling cost of ₹3.50 per unit). Fixed costs are incurred uniformly throughout the year and amount to ₹35,00,000 (including depreciation of ₹15,00,000). There are no beginning or ending inventories.

Required:

(i) Estimate breakeven sales level quantity and cash breakeven sales level quantity.
(ii) Estimate the P/V ratio.
(iii) Estimate the number of units that must be sold to earn an income (EBIT) of ₹2,50,000.
(iv) Estimate the sales level to achieve an after-tax income (PAT) of ₹2,50,000. Assume 40% corporate Income Tax rate.

[(8 Marks) Nov 2010]

Answer

(a) Break even sales $= \frac{\text{Fixed cost}}{\text{Contribution per unit}} = \frac{35,00,000}{37.50-17.50}$

$=$ ***1,75,000 units.***

Cash BEP (in Quantity) $= \frac{\text{Fixed cost (excluding depreciation)}}{\text{Contribution per unit}}$

$= \frac{35,00,000-15,00,000}{37.50-17.50} =$ ***1,00,000 units.***

(b) P/V ratio $= \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{37.50-17.50}{37.50} \times 100$

$=$ ***53.33%***

(c) No. of units must be sold $= \frac{\text{Fixed cost + Desired EBIT}}{\text{Contribution per unit}}$

$= \frac{35,00,000+2,50,000}{20.00} =$ ***1,87,500 units.***

(d) Desired Sales level (₹) $= \frac{\text{Fixed cost + Desired Profit Before Tax}}{\text{PV ratio}}$

$= \frac{35,00,000+4,16,667}{53.33\%} =$ ***₹73,43,750***

WN:

Desired PAT = ₹2,50,000
Tax rate = 40%
Desired Profit before tax $= \frac{\text{Desired PAT}}{(1-t)} = \frac{2,50,000}{(1-0.40)} =$ ***₹4,16,667***

BQ 14

An automobile manufacturing company produces different models of Cars. The budget in respect of model 118 for the month of March is as under:

Budgeted Output	***₹ (in lacs)***	***40,000 units ₹ (in lacs)***
Variable costs:		
Materials	79,200	
Labour	15,600	
Direct Expenses	37,200	1,32,000
Fixed costs:		
Specific Fixed Cost	27,000	
Allocated Fixed Cost	33,750	60,750
Total Costs		***1,92,750***
Profit		17,250
Sales		***2,10,000***

Calculate:

(i) Profit with 10 percent increase in selling price with a 10 percent reduction in sales volume.
(ii) Volume to be achieved to maintain the original profit after a 10 per cent rise in material costs at the originally budgeted selling price per unit.

[(i) ₹28,350 Lakhs (ii) 44,521 units]

BQ 15

A Ltd. maintains margin of safety of 37.5% with an overall contribution to sales ratio of 40%. Its fixed costs amount to ₹5,00,000.

Calculate (i) Break-even sales, ***(ii)*** Total sales, ***(iii)*** Total variable cost, ***(iv)*** Current profit, ***(v)*** New 'margin of safety' if the sales volume is increased by 7-½%.

Answer

(i)	Break Even Sales × PV Ratio	=	Fixed Cost		
	Break Even Sales × 40%	=	₹5,00,000		
	Break Even Sales	=	₹5,00,000 ÷ 40%	=	***₹12,50,000***
(ii)	Total Sales	=	Break Even Sales + Margin of Safety		
	Total Sales	=	₹12,50,000 + 37.50% of Total Sales		
	62.50% of Total Sales	=	₹12,50,000		
	Total Sales	=	₹12,50,000 ÷ 62.50%	=	***₹20,00,000***
(iii)	Contribution to Sales Ratio	=	40%		
	Therefore, Variable cost to Sales Ratio	=	60%		
	Variable cost	=	60% of sales		
	Variable cost	=	60% of ₹20,00,000	=	***₹12,00,000***
(iv)	***Current Profit***	=	Sales - (Variable Cost + Fixed Cost)		
		=	₹20,00,000 - (₹12,00,000 + ₹5,00,000)		
		=	***₹3,00,000***		
(v)	***New Sales value***	=	₹20,00,000 + 7.50% of ₹20,00,000		
		=	***₹21,50,000***		
	New Margin of Safety	=	New Sales value – BES		
		=	₹21,50,000 - ₹12,50,000	=	***₹9,00,000***

BQ 16

PQR Ltd. has furnished the following data for the two years:

Particulars	***2022***	***2023***
Sales	₹8,00,000	?
Profit Volume Ratio	50%	37.50%
Margin of Safety sales as a % of total sales	40%	21.875%

There has been substantial savings in the fixed cost in the year 2023 due to the restructuring process. The company could maintain its sales quantity level of 2022 in 2023 by reducing selling price.

You are required to calculate the following:

(i) Sales for 2023 in ₹;
(ii) Fixed cost for 2023;
(iii) Break-even sales for 2023 in ₹.

Answer

In 2022:

PV ratio	=	50%		
Variable cost ratio	=	100% - 50%	=	50%
Variable cost in 2022	=	₹8,00,000 × 50%	=	***₹4,00,000***

In 2023:

Sales quantity has not changed. Thus variable cost in 2023 is ₹4,00,000.

PV ratio	=	37.50%		
Thus, Variable cost ratio	=	100% - 37.50%	=	62.50%
(i) Thus sales in 2023	=	$\frac{4,00,000}{62.5\%}$	=	***₹6,40,000***

At break-even point, fixed cost is equal to contribution.

In 2023, Break-even sales	=	100% - 21.875%	=	78.125%
(iii) Break-even sales	=	6,40,000 × 78.125%	=	***₹5,00,000***
(ii) Fixed cost	=	BEP sales × PV ratio		
	=	5,00,000 × 37.50%	=	***₹1,87,500***

BQ 17

A single product company sells its product at ₹60 per unit. In 2022, the company operated at a margin of safety of 40%. The fixed costs amounted to ₹3,60,000 and the variable cost ratio to sales was 80%. In 2023, it is estimated that the variable cost will go up by 10% and the fixed cost will increase by 5%.

Find the selling price required to be fixed in 2023 to earn the same P/V ratio as in 2022. Assuming the same selling price of ₹60 per unit in 2023, find the number of units required to be produced and sold to earn the same profit as in 2022.

Answer

1. PV Ratio in 2022:

Selling price per unit	60
Variable cost (80% of Selling price)	48
Contribution	12
P/V Ratio	***20%***

2. No. of units sold in 2022:

Break-even point	=	Fixed cost ÷ Contribution per unit		
	=	₹3,60,000 ÷ ₹12	=	***30,000 units.***

Margin of safety is 40%. Therefore, break-even sales will be 60% of units sold.

No. of units sold	=	BEP in units ÷ 60%	=	***50,000 units.***

3. Profit earned in 2022:

Profit	=	Contribution – Fixed cost		
	=	(50,000 × ₹12) - ₹3,60,000	=	***₹2,40,000***

4. Selling price to be fixed in 2023:

Revised variable cost	=	₹48 × 110%	=	₹52.80

Revised fixed cost	=	₹3,60,000 × 105%	=	3,78,000
PV Ratio	=	20% (Same as of 2016)		
Variable cost ratio	=	80%		
Revised selling price	=	₹52.80 ÷ 80%	=	***₹66.00***

5. No. of units to be produced and sold in 2023 to earn the same profit:

$$= \frac{\text{Fixed cost} + \text{Desired profit}}{\text{Contribution per unit}} = \frac{2,40,000 + 3,78,000}{60 - 52.80} = \textbf{85,834 units}$$

BQ 18

A company has three factories situated in North, East and South with its head office in Mumbai. The management has received the following summary report on the operations of each factory for a period:

Factory	Sales		Profit	
	Actual	Over / (Under Budget)	Actual	Over / (Under Budget)
North	1,100	(400)	135	(180)
East	1,450	150	210	90
South	1,200	(200)	330	(110)

Calculate for each factory and for the company as a whole for the period Fixed Costs and Break - Even Sales.

[(i) ₹1,350 (ii) ₹2,500]

BQ 19

The profit for the year of R.J. Ltd. works out to 12.5% of the capital employed and the relevant figures are as under:

Sales	₹5,00,000
Direct Materials	₹2,50,000
Direct Labour	₹1,00,000
Variable Overheads	₹40,000
Capital Employed	₹4,00,000

The new Sales Manager who has joined the company recently estimates for next year a profit of about 23% on capital employed, provided the volume of sales is increased by 10% and simultaneously there is an increase in Selling Price of 4% and an overall cost reduction in all the elements of cost by 2%.

Find out by computing in detail the cost and profit for next year, whether the proposal of Sales Manager can be adopted.

Answer

Statement Showing Cost and Profit for the Next Year

Particulars	Existing	Estimated
Sales Value	5,00,000	5,72,000
Less: Direct Materials	2,50,000	2,69,500
Direct Labour	1,00,000	1,07,800
Variable Overheads	40,000	43,120
Contribution	***1,10,000***	***1,51,580***
Less: Fixed Cost	60,000	58,800
Profit	***50,000***	***92,780***

Fixed Cost = Existing Sales – Existing Marginal Cost – 12.5% on ₹4,00,000

= ₹5,00,000 – ₹3,90,000 – ₹50,000 = ***₹60,000***

Percentage Profit on Capital Employed equals to 23.19% $\left(\frac{92,780}{4,00,000} \times 100\right)$

Since the Profit of ₹92,780 is more than 23% of capital employed, the proposal of the Sales Manager can be adopted.

BQ 20

An Indian soft drink company is planning to establish a subsidiary company in Bhutan to produce mineral water. Based on the estimated annual sales of 40,000 bottles of the mineral water, cost studies produced the following estimates for the Bhutanese subsidiary:

Name of Expense	*Total Annual Cost*	*% of Total annual cost which is variable*
Materials	2,10,000	100%
Labour	1,50,000	80%
Factory Overheads	92,000	60%
Administration Expenses	40,000	35%

The Bhutanese production will be sold by manufacturer's representatives who will receive a commission of 8% of the sale price. No portion of the Indian office expenses is to be allocated to the Bhutanese subsidiary.

You are required to

1. Compute the sale price per bottle to enable the management to realize an estimated 10% profit on sale proceeds in Bhutan.
2. Calculate the break-even point in sales as also in number of bottles for the Bhutanese subsidiary on the assumption that the sale price is ₹14 per bottle.

Answer

1. Calculation of sales price to earn 10% profit on sales:

Sales value = Fixed cost + Variable cost + Profit

Sales value = (2,10,000 × 0% + 1,50,000 × 20% + 92,000 × 40% + 40,000 × 65%) + (2,10,000 × 100% + 1,50,000 × 80% + 92,000 × 60% + 40,000 × 35% + Commission @ 8% on sales) + Profit @10% on sales

Sales value = 92,800 + 3,99,200 + 8% of sales + 10% of sales

Sales value = 4,92,000 ÷ 82% = ***₹6,00,000***

Sales Price = Sales value ÷ No. of units

= 6,00,000 ÷ 40,000 units = ***₹15.00***

2. Calculation of Break Even Point:

Break Even Point (in units) = Fixed cost ÷ Contribution per unit

= 92,800 ÷ 2.90 (14 – 11.10) = ***32,000 units***

Break Even Point (in ₹) = BEP in units × Sales price per unit

= 32,000 units × 14.00 = ***₹4,4,8000***

Working notes:

Total variable cost = 3,99,200 + 8% on sales (8% of 40,000 × 14.00)

= 4,44,000

Variable cost per unit = Total variable cost ÷ No. of units

= 4,44,000 ÷ 40,000 units = ₹11.10

BEP IN CASE OF STOCK

BQ 21

The Co. has an opening stock of 6,000 units of output. Production plan for current period is 24,000 units. Expected sale for the current period comes to 28,000 units. The selling price per unit ₹10 variable cost per unit is ₹6 while it was ₹5 per unit during the previous period. Fixed cost of the current period is ₹86,000.

Find out break-even point using FIFO Method.

[14,000 units of current period and 6,000 units of previous period]

CONTRIBUTION, PV RATIO, BEP, MOS AND PROFIT PLANNING

BQ 22

M Company's central services department is evaluating new copying machines to replace the firm's current copier, which is worm out. The analysis of alternative machines has been narrowed to two and the estimated costs of operating them are shown below:

Particulars	Cost per 100 copies	
	Machine A	Machine B
Material Costs (Variable)	₹60	₹40
Labour Cost (variable)	₹80	₹30
Annual Lease Cost (Fixed)	₹30,000	₹58,000

Required:

(i) Compute the cost indifference points for the two alternatives.
(ii) What do the cost indifference points suggest as a course of action in this regard?
(iii) If the management expects to need 87,000 copies next year, which copier would be most economical?

[(i) 40,000 Copies; (ii) Below 40,000: A, At 40,000: A/B, Above 40,000: B; (iii) B]

BQ 23

The following are cost data for three alternative ways of processing the clerical work for cases brought before the LC Court System:

Particulars	'A' Manual (₹)	'B' Semi Automatic (₹)	'C' Fully Automatic (₹)
Monthly fixed costs:			
Occupancy	15,000	15,000	15,000
Maintenance contract	-	5,000	10,000
Equipment lease	-	25,000	1,00,000
Unit variable cost (per report):			
Supplies	40	80	20
Labour	200 (5 hours × 40)	60 (1 hour × 60)	20 (0.25 hour × 80)

1. Calculate cost indifference points. Interpret your results.

2. If the present case load is 600 cases and it is expected to go up to 850 cases in near future, which method is most appropriate on cost considerations?

Answer

1. Statement Showing Cost Indifference Point

Particulars	A and B	A and C	B and C
(a) Differential Fixed Cost	30,000 (45,000 – 15,000)	1,10,000 (1,25,000 – 15,000)	80,000 (1,25,000 – 45,000)
(b) Differential Variable Cost	100 (240 - 140)	200 (240 - 40)	100 (140 - 40)
(c) Cost Indifference Point (a) ÷ (b)	*300 cases*	*550 cases*	*800 cases*

Interpretation of Results

At activity level below the indifference points, the alternative with lower fixed costs and higher variable costs should be used. At activity level above the indifference point alternative with higher fixed costs and lower variable costs should be used.

Number of Cases	Alternative to be Chosen
Cases ≤ 300	Alternative 'A'
300 ≥ Cases ≤ 800	Alternative 'B'
Cases ≥ 800	Alternative 'C'

2. Present case load is 600. Therefore, alternative B is suitable. As the number of cases is expected to go upto 850 cases, alternative C is most appropriate.

SHUT DOWN POINT

BQ 24

Mr. X has ₹2,00,000 investments in his business firm. He wants a 15 percent return on his money. From an analysis of recent cost figures, he finds that his variable cost of operating is 60 percent of sales, his fixed costs are ₹80,000 per year.

Show computations to answer the following questions:

(i) What sales volume must be obtained to break even?

(ii) What sales volume must be obtained to get 15 percent return on investment?

(iii) Mr. X estimates that even if he closed the doors of his business, he would incur ₹25,000 as expenses per year. At what sales would he be better off by locking his business up?

Answer

P/V Ratio = 100 – Variable cost ratio

= 100 – 60% = ***40%***

(i) Break-even point = Fixed cost ÷ PV ratio

= 80,000 ÷ 40% = ***₹2,00,000***

(ii) Sales volume required $= \frac{\text{Fixed cost} + \text{Desired profit}}{\text{PV ratio}}$

$= \frac{80{,}000 + 15\% \text{ of } 2{,}00{,}000}{40\%}$ = ***₹2,75,000***

(iii) Shut down point $< \frac{\text{Avoidable fixed cost}}{\text{PV ratio}}$

$< \frac{80{,}000 - 25{,}000}{40\%}$ < ***₹1,37,500***

Mr. X should shut down the business if the sale is less than ₹1,37,500.

SALES MIX OR CONCEPT OF MULTIPLE PRODUCTS

BQ 25

A Company sells two products, A and B. The sales mix is 5 units of A and 3 units of B. The sale price of A and B are ₹80 and ₹60 per unit respectively and variable cost ₹50 and ₹45 respectively. Fixed costs are ₹4,87,500 per month.

Compute the break-even point.

Answer

Break Even Points in units = $\frac{\text{Fixed cost}}{\text{Composite contribution per unit}}$ = $\frac{4,87,500}{24.375}$

= ***20,000 units (12,500 units of A and 7,500 units of B)***

WN:

Composite contribution = [(30 × 5 units of A) + (15 × 3 units of B)] ÷ 8 units

= ***24.375 per unit***

BQ 26

The product mix of a Gama Ltd. is as under:

Particulars	Product M	Product N
Units	54,000	18,000
Selling price	₹7.50	₹15.00
Variable cost	₹6.00	₹4.50

Find the break-even points in units, if the company discontinues product 'M' and replace with product 'O'. The quantity of product 'O' is 9,000 units and its selling price and variable costs respectively are ₹18 and ₹9. Fixed Cost is ₹ 15,000.

Answer

Break Even Point = $\frac{\text{Fixed Cost}}{\text{Composite Contribution Per Unit}}$ = $\frac{15,000}{10}$

= ***1,500 units (1,000 units of 'N' and 500 units of 'O' in 2 : 1)***

Working note:

Composite contribution = [(10.50 × 2 units of N) + (9 × 1 unit of O)] ÷ 3 units = ***10 per unit***

BQ 27

M.K. Ltd. manufactures and sells a single product X whose selling price is ₹40 per unit and the variable cost is ₹16 per unit.

(a) If the Fixed Costs for this year are ₹4,80,000 and the annual sales are at 60% margin of safety, calculate the rate of net return on sales, assuming an income tax level of 40%

(b) For the next year, it is proposed to add another product line Y whose selling price would be ₹50 per unit and the variable cost ₹10 per unit. The total fixed costs are estimated at ₹6,66,600. The sales mix units of X : Y would be 7 : 3. At what level of sales next year, would M.K. Ltd. break even? Give separately for both X and Y the breakeven sales in rupee and quantities.

Answer

(a) Rate of net return on sales = $\frac{4,32,000}{20,00,000} \times 100$ = ***21.60%***

(b) Break Even Point = $\frac{\text{Fixed Cost}}{\text{Composite Contribution Per Unit}}$ = $\frac{6,66,600}{28.80}$

= ***23,145.80 units***

Break even Sales Mix:

Product X = 70% of 23,145.80 units = ***16,202 units or ₹6,48,080***

Product Y = 30% of 23,145.80 units = ***6,944 units or ₹3,47,200***

Working notes:

(1) Calculation of Net return:

Particulars	***(₹)***
Sales value (50,000 units × 40)	20,00,000
Less: Variable cost (50,000 units × 16)	8,00,000
Contribution	***12,00,000***
Less: Fixed cost	4,80,000
Profit Before Tax	***7,20,000***
Less: Income Tax @ 40%	2,88,000
Profit After Tax	***4,32,000***

BEP in units = $\frac{\text{Fixed cost}}{\text{contribution per unit}}$ = $\frac{4,80,000}{40-16}$ = 20,000 units

Total sales = BEP + MOS (60% of sales) = 20,000 units + 60% sales

Total sales = 20,000 units ÷ 40% = 50,000 units

(2) Composite Contribution per unit= (40 – 16) × 7/10 + (50 - 10) × 3/10 = ***28.80 per unit***

BQ 28

Prisha Limited manufactures three different products and the following information has been collected from the books of accounts:

	Products		
	A	***B***	***C***
Sales Mix	40%	35%	25%
Selling Price	₹300	₹400	₹200
Variable Cost	₹150	₹200	₹120
Total Fixed Costs			₹18,00,000
Total Sales			₹60,00,000

The company has currently under discussion, a proposal to discontinue the manufacture of Product C and replace it with Product E, when the following results are anticipated:

	Products		
	A	***B***	***E***
Sales Mix	45%	30%	25%
Selling Price	₹300	₹400	₹300
Variable Cost	₹150	₹200	₹150
Total Fixed Costs			₹18,00,000
Total Sales			₹64,00,000

Required:

(a) Calculate the PV ratio, Total contribution, Profit and Break-even sales for the existing product mix.

(b) Calculate the PV ratio, Total contribution, Profit and Break-even sales for the proposed sales mix.

(c) State whether the proposed sales mix is accepted or not?

Answer

(a) Calculation of PV Ratio, Total Contribution, Profit and BEP for the existing product mix:

	Products			Total
	A	B	C	
Selling Price (₹)	300	400	200	
Less: Variable Cost (₹)	150	200	120	
Contribution per unit (₹)	150	200	80	
P/V Ratio	50%	50%	40%	
Sales Mix	40%	35%	25%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	20%	17.5%	10%	47.5%
Present Total Contribution (₹60,00,000 × 47.5%)				₹28,50,000
Less: Fixed Costs				₹18,00,000
Present Profit				₹10,50,000
Present Break-Even Sales (₹18,00,000/0.475)				₹37,89,473.68

(b) Calculation of PV Ratio, Total Contribution, Profit and BEP for the proposed product mix:

	Products			Total
	A	B	E	
Selling Price (₹)	300	400	300	
Less: Variable Cost (₹)	150	200	150	
Contribution per unit (₹)	150	200	80	
P/V Ratio	50%	50%	50%	
Sales Mix	45%	30%	25%	
Contribution per rupee of sales (P/V Ratio × Sales Mix)	22.5%	15%	12.5%	50%
Present Total Contribution (₹64,00,000 × 50%)				₹32,00,000
Less: Fixed Costs				₹18,00,000
Present Profit				₹14,00,000
Present Break-Even Sales (₹18,00,000/0.5)				₹36,00,000

(c) The proposed sales mix increases the total contribution to sales ratio from 47.5% to 50% and the total profit from ₹10,50,000 to ₹14,00,000. Thus, the proposed sales mix should be accepted.

MERGER OF PLANTS

BQ 29

Two manufacturing companies A and B are planning to merge. The details are as follows:

	A	B
Capacity utilisation (%)	90	60
Sales (₹)	31,50,000	24,00,000
Variable Cost (₹)	19,80,000	11,25,000
Fixed Cost (₹)	6,50,000	7,50,000

Assuming that the proposal is implemented, calculate:

(1) Break-Even sales of the merged plant and the capacity utilization at that stage.
(2) Profitability of the merged plant at 80% capacity utilization.
(3) Sales Turnover of the merged plant to earn a profit of ₹30,00,000.
(4) When the merged plant is working at a capacity to earn a profit of ₹30,00,000, what percentage of increase in selling price is required to sustain an increase of 5% in fixed overheads.

Answer

(1) Break-Even sales of the merged plant and the capacity utilization at that stage:

Break-Even Sales	=	Fixed Cost ÷ P/V Ratio		
	=	₹14,00,000 ÷ 45.67%	=	***₹30,65,470***
Capacity Utilization	=	(BEP Sales ÷ Sales at 100% Capacity) × 100		
	=	(₹30,65,470 ÷ ₹75,00,000) × 100	=	***40.87%***

(2) Profitability of merged plant at 80% Capacity:

Profit	=	Contribution – Fixed Cost	
	=	{(₹75,00,000 × 80%) × 45.67%} - ₹14,00,000=	***₹13,40,200***

(3) Sales to earn a profit of ₹30,00,000:

Sales	=	(Fixed Cost + Profit) ÷ P/V Ratio		
	=	(₹14,00,000 + ₹30,00,000) ÷ 45.67%	=	***₹96,34,333***

(4) % increase in selling price:

Increase in fixed cost	=	₹14,00,000 × 5%	=	₹70,000
∴ % increase in sales price	=	(₹70,000 ÷ ₹96,34,333) × 100	=	***0.727%***

Working Notes:

Calculation of Sales, Variable Cost, P/V Ratio and Fixed Cost at 100% capacity of merged plant:

Sales	=	(₹31,50,000 ÷ 90%) + (₹24,00,000 ÷ 60%)	=	₹75,00,000
Variable Cost	=	(₹19,80,000 ÷ 90%) + (₹11,25,000 ÷ 60%)	=	₹40,75,000
P/V Ratio	=	(Contribution ÷ Sales) × 100		
	=	{(₹75,00,000 – ₹40,75,000) ÷ ₹75,00,000} × 100	=	45.67%
Fixed Cost	=	₹6,50,000 + ₹7,50,000	=	₹14,00,000

KEY FACTOR OR LIMITING FACTOR

BQ 30

Moon Ltd. produces products 'X', 'Y', 'Z' and has decided to analyse it's production mix in respect of these three products: 'X', 'Y', 'Z'.

You have the following information:

	X	***Y***	***Z***
Direct Material ₹ (per unit)	160	120	80
Variable Overheads ₹ (per unit)	8	20	12
Direct Labour:			

Departments:	***Rate per hour (₹)***	***Hours per unit X***	***Hours per unit Y***	***Hours per unit Z***
Department A	4	6	10	5
Department B	8	6	15	11

From the current budget, further details are as below:

Particulars	X	Y	Z
Annual production at present (in units)	10,000	12,000	20,000
Estimated selling price per unit (₹)	312	400	240
Sales departments estimate of possible sales in the coming year (in units)	12,000	16,000	24,000

There is constraint on supply of labour in Department A and its manpower cannot be increased beyond its present level.

Required:

(i) Identify the best possible product mix of Moon Ltd.
(ii) Calculate the total contribution from the best possible product mix.

Answer

(i) Statement Showing Best Possible Mix of Moon Ltd.

Rank	Product	Units/Mix	Labour hours dept. A
I	Product X	12,000	72,000
II	Product Y	16,000	1,60,000
III	Product Z (48,000 ÷ 5)	9,600	48,000 (b.f.)
Total		***37,600***	***2,80,000***

Best possible mix of X, Y, Z is 12,000 : 16,000 : 9,600

(ii) Calculation of contribution from best possible mix:

Total contribution = 12,000 units of X × 72 + 16,000 units of Y × 100 + 9,600 units of Z × 40
= ***₹28,48,000***

Working notes:

(1) Calculation of total available labour hours in department A:

Total available labour hours = 10,000 units of X × 6 hours + 12,000 units of Y × 10 hours + 20,000 units of Z × 5 hours
= 2,80,000 hours

(2) Calculation of Contribution per labour hour of department A and Rank:

Particulars	X	Y	Z
Sale price per unit	312	400	240
Less: Direct materials per unit	160	120	80
Less: Variable overheads per unit	8	20	12
Less: Wages per unit:			
Department A	24 (6 × 4)	40 (10 × 4)	20 (5 × 4)
Department B	48 (6 × 8)	120 (15 × 8)	88 (11 × 8)
Contribution per unit	72	100	40
÷ Labour hours per unit of Dept. A	÷ 6	÷ 10	÷ 5
Contribution per labour hour Dept. A	12	10	8
Rank	***I***	***II***	***III***

BQ 31

X Ltd. supplies spare parts to an air craft company Y Ltd. The production capacity of X Ltd. facilitates production of any one spare part for a particular period of time. The following are the cost and other information for the production of the two different spare parts A and B:

Per unit	Part A	Part B
Alloy usage	1.6 kgs.	1.6 kgs.
Machine Time: Machine A	0.6 hrs.	0.25 hrs.
Machine Time: Machine B	0.5 hrs.	0.55 hrs.
Target Price (₹)	145	115

Total hours available for Machine A: 4,000 hours and for Machine B: 4,500 hours. Alloy available is 13,000 kgs @ ₹12.50 per kg. Variable overheads per machine hours for Machine A: ₹80 and for Machine B: ₹100

Required

1. Identify the spare part which will optimize contribution at the offered price.
2. If Y Ltd. reduces target price by 10% and offers ₹ 60 per hour of unutilized machine hour, what will be the total contribution from the spare part identified above?

Answer

1. Statement Showing Optimum Contribution

Particulars	Part A	Part B
Maximum units to be manufactured and sold	6,666	8,125
Sales Price	145	115
Less: Materials 1.60 kgs. @ ₹12.50 per kg	20	20
Variable overheads Machine A 0.6/.25 hour @ ₹80	48	20
Variable overheads Machine B 0.5/.55 hour @ ₹100	50	55
Contribution per unit	**27**	**20**
Maximum Contribution (Contribution per unit × Max. units)	**1,79,982**	**1,62,500**

Calculation of maximum number of units that can be produced under various limiting factor:

Particulars	Part A	Part B
Machine A (4,000 hours)	6,666 (4,000 ÷ 0.6)	16,000 (4,000 ÷ 0.25)
Machine B (4,500 hours)	9,000 (4,500 ÷ 0.5)	8,181 (4,500 ÷ 0.55)
Alloy Available (13,000 kg.)	8,125 (13,000 ÷ 1.6)	8,125 (13,000 ÷ 1.6)
Maximum number of part to be manufactured (least of all)	**6,666**	**8,125**

Spare Part A will optimize the contribution.

2. Statement Showing Revised Contribution

Particulars	Part A
Parts to be manufactured	6,666
Machine A to be used (0.6 × 6,666)	4,000
Machine B to be used (0.5 × 6,666)	3,333
Underutilized machine hours (4,500 – 3,333)	1,167
Compensation for unutilized machine hours (1,167 × ₹60)	70,020
Reduction in price by 10% (6,666 × 145 × 10%)	96,657
Total revised contribution (1,79,982 + 70,020 – 96,657)	**1,53,345**

BQ 32

A company can make any one of the 3 products X, Y or Z in a year. It can exercise its option only at the beginning of each year. Fixed cost for the period is ₹30,000, Relevant information about the products for the next year is given below:

Details	X	Y	Z
Selling price per unit (₹)	10	12	12
Variable cost per unit (₹)	6	9	7
Market demand in units	3,000	2,000	1,000
Production capacity in units	2,000	3,000	900

Compute the opportunity costs for each of the products.

Answer

Statement Showing Opportunity Cost

Details	X	Y	Z
Contribution per unit (₹)	4	3	5
Units (lower of market demand or production capacity)	2,000	2,000	900
Possible contribution (₹)	8,000	6,000	4,500
Opportunity cost (₹)	6,000	8,000	8,000

Opportunity cost is the maximum possible contribution forgone by not producing alternative product i.e. if Product X is produced then opportunity cost will be maximum of (₹ 6,000 from Y, ₹ 4,500 from Z).

MAKE OR BUY DECISION

BQ 33

NN Ltd. manufactures automobiles accessories and parts. The following are the total cost of processing 2,00,000 units:

Direct material cost	₹375 per unit
Direct labour cost	₹80 per unit
Variable factory overhead	₹16 per unit
Fixed factory overhead	₹500 Lakhs

The purchase price of the component is ₹485. The fixed overhead would continue to be incurred even when the component is bought from outside.

Required:

(a) Should the part be made or bought from outside considering that the present facility when released following a buying decision would remain idle?

(b) In case the released capacity can be rented out to another manufacturer for ₹32,00,000 having good demand. What should be the decision?

Answer

(a) Make or Buy decision when present facility would remain idle:

Variable cost per unit	=	₹375 + ₹80 + ₹16	=	₹471
Buying cost of component	=	₹485		

Decision: Here the variable cost of making the component is ₹471 as compared to buying cost of ₹485. The

component shall be made by using own production facility as it would save the company ₹14 per unit.

Note: The fixed cost of ₹500 lakhs is irrelevant for decision making as it would incur in either case.

(b) Make or Buy decision when present facility can be rented out:

Rental income if we buy	=	₹32,00,000		
Additional cost of buying	=	(₹485 - ₹471) × 2,00,000 units	=	₹28,00,000
Net benefit if we buy	=	₹32,00,000 - ₹28,00,000	=	₹4,00,000

Decision: The component should be bought from outside as it would save the company ₹4,00,000 in fixed cost.

PROCESSING OF SPECIAL ORDER

BQ 34

PQR Ltd. manufactures medals for winners of athletic events and other contests. Its manufacturing plant has the capacity to produce 10,000 medals each month. The company has current production and sales level of 7,500 medals per month. The current domestic market price of the medal is ₹150. The cost data for the month of August 2023 is as under:

	(₹)
Variable cost:	
Direct material cost	2,62,500
Direct labour cost	3,00,000
Overheads	75,000
Fixed manufacturing cost	2,75,000
Fixed marketing cost	1,75,000
Total cost	***10,87,500***

PQR Ltd. has received a special onetime only order for 2,500 medals at ₹120 per medal.

Required:

(1) Should PQR Ltd. accept the special order? Why? Explain briefly.

(2) Suppose the plant capacity was 9,000 medals instead of 10,000 medals each month. The special order must be taken either in full or rejected totally. Analyse whether PQR Ltd. should accept the special order or not.

Answer

(1) Profit if we accept special order of 2,500 units with capacity of 10,000 units:

Particulars		*Amount (₹)*
Sales	(7,500 units × ₹150) + (2,500 units × ₹120)	14,25,000
Less: Variable Cost:		
Direct material cost	(2,62,500 × 10,000/7,500)	3,50,000
Direct labour cost	(3,00,000 × 10,000/7,500)	4,00,000
Overheads	(75,000 × 10,000/7,500)	1,00,000
Contribution		***5,75,000***
Less: Fixed manufacturing cost		2,75,000
Less: Fixed marketing cost		1,75,000
Proposed Profit		***1,25,000***

Decision: The offer for 2,500 units be accepted as it increases the profit by ₹87,500 (₹1,25,000 – ₹37,500).

(2) Profit if we accept special order of 2,500 units with capacity of 9,000 units:

Particulars		Amount (₹)
Sales	(6,500 units × ₹150) + (2,500 units × ₹120)	12,75,000
Less: Variable Cost:		
Direct material cost	(2,62,500 × 9,000/7,500)	3,15,000
Direct labour cost	(3,00,000 × 9,000/7,500)	3,60,000
Overheads	(75,000 × 9,000/7,500)	90,000
Contribution		**5,10,000**
Less: Fixed manufacturing cost		2,75,000
Less: Fixed marketing cost		1,75,000
Proposed Profit		**60,000**

Decision: The offer for 2,500 units be accepted as it increases the profit by ₹22,500 (₹60,000 – ₹37,500).

Working note:

Existing profit at 7,500 units

Particulars		Amount (₹)
Sales	(7,500 units × ₹150)	11,25,000
Less: Variable Cost:		
Direct material cost		2,62,500
Direct labour cost		3,00,000
Overheads		75,000
Contribution		**4,87,500**
Less: Fixed manufacturing cost		2,75,000
Less: Fixed marketing cost		1,75,000
Existing Profit		**37,500**

ABSORPTION COSTING V/S MARGINAL COSTING

BQ 35

XYZ Ltd. has a production capacity of 2,00,000 units per year normal capacity utilization is reckoned as 90%. Standard variable production costs are ₹11 per unit. The fixed costs are ₹3,60,000 per year. Variable selling costs are ₹3 per unit & fixed selling costs are ₹2,70,000 per year. The unit selling price is ₹20. In the year just ended on 30th June 2023, the production was 1,60,000 units & sales were 1,50,000 units. The closing inventory on 30th June 2023 was 20,000 units. The actual variable production costs for the year were ₹35,000 higher than the standard.

Calculate the profit for the year:

(a) By the absorption costing method,
(b) By the marginal costing method,
(c) Explain the difference in the profits.

Answer

(a) Income Statement (Under Absorption Costing)

Particulars		₹
Sales (1,50,000 units @ ₹20)		30,00,000
Production costs:		
Variable (1,60,000 units @ ₹11)	17,60,000	
Add :Increase	35,000	17,95,000
Fixed (1,60,000 units @ ₹2*)		3,20,000

Cost of Goods Produced	***21,15,000***
Add: Opening stock (10,000 Units @ ₹13*)	1,30,000
Less: Closing stock $\left(\frac{21,15,000}{1,60,000} \times 20,000 \text{ units}\right)$	(2,64,375)
Cost of Goods Sold	***19,80,625***
Add: Under absorbed fixed production overhead (3,60,000-3,20,000)	40,000
Add: Variable selling costs (1,50,000 units @ ₹3)	4,50,000
Add: Fixed selling costs	2,70,000
Total cost	***27,40,625***
Profit (Sales – Total Cost)	***2,59,375***

(b) Income Statement (Under Marginal Costing)

Particulars		***₹***
Sales (1,50,000 units @ ₹20)		30,00,000
Variable cost of goods sold:		
Variable production cost (1,60,000 units @ ₹11 + ₹35,000)		17,95,000
Variable cost of production		***17,95,000***
Add: Opening Stock (10,000 units @ ₹11)		1,10,000
Less: Closing stock $\left(\frac{17,95,000}{1,60,000} \times 20,000 \text{ units}\right)$		(2,24,375)
Variable cost of goods sold		***16,80,625***
Variable selling cost (1,50,000 units @ ₹3)		4,50,000
Variable Cost of Sales		***21,30,625***
Contribution (Sales - Variable Cost of Sales)		***8,69,375***
Less: Fixed cost:		
Production	3,60,000	
Selling	2,70,000	(6,30,000)
Profit (Contribution – Fixed Cost)		***2,39,375***

Working Notes:

- Fixed production overhead are absorbed at a pre-determined rate based on normal capacity, i.e. ₹3,60,000 ÷ 1,80,000 units = ₹2 per unit
- Opening stock is 10,000 units (1,50,000 units + 20,000 units - 1,60,000 units). It is valued at ₹13 per unit [₹11 + ₹2 (standard variable + standard fixed)].

(c) Reconciliation Statement

Particulars	***₹***
Profit as per absorption costing	2,59,375
Add: Opening stock under-valued in marginal costing (₹1,30,000 – ₹1,10,000)	20,000
Less: Closing Stock under-valued in marginal closing (₹2,64,375 – ₹2,24,375)	(40,000)
Profit as per marginal costing	***2,39,375***

BQ 36

Wonder ltd manufactures a single product, ZEST. The following figures relate to ZEST for a one year period:

Activity Level	***50%***	***100%***
Sales and production (units)	400	800
Sales	₹8,00,000	₹16,00,000
Production costs:		
Variable	₹3,20,000	₹6,40,000
Fixed	₹1,60,000	₹1,60,000

Selling and distribution costs:		
Variable	₹1,60,000	₹3,20,000
Fixed	₹2,40,000	₹2,40,000

The normal level of activity for the year is 800 units. Fixed costs are incurred evenly throughout the year and actual fixed costs are the same as budgeted. There were no stocks of ZEST at the beginning of the year. In the first quarter, 220 units were produced and 160 units were sold.

Required:

(a) What would be the fixed production costs absorbed by ZEST if absorption costing is used?
(b) What would be the under/over-recovery of overheads during the period?
(c) What would be the profit using absorption costing?
(d) What would be the profit using marginal costing?
(e) Why is there a difference between the answers to ***(c)*** and ***(d)***?

Answer

(a) Fixed production costs absorbed:

Budgeted fixed production costs	₹1,60,000
Budgeted output (Normal level of activity 800 units)	
Therefore, the absorption rate (₹1,60,000 ÷ 800)	₹200 per unit
Fixed cost recovered (During the first quarter, 220 units × ₹200)	***₹44,000***

(b) Under/over-recovery of overheads during the period:

Actual fixed production overhead (¼ of ₹1,60,000)	₹40,000
Absorbed fixed production overhead	₹44,000
Over-recovery of overheads	***₹4,000***

(c) Profit for the Quarter (Absorption Costing)

Activity Level	***₹***	***₹***
Sales revenue (160 units × ₹2,000)		3,20,000
Production costs:		
Variable (220 units × ₹800)	1,76,000	
Fixed overheads absorbed (220 units × ₹200)	44,000	2,20,000
Cost of production		***2,20,000***
Add: Opening stock		Nil
Less: Closing stock (₹2,20,000 ÷ 220 units) × 60 units		(60,000)
Cost of goods sold		***1,60,000***
Less: Adjustment for over recovery of fixed overheads		(4,000)
Add: Selling and distribution costs:		
Variable (160 units × ₹400)	64,000	
Fixed (¼ of ₹2,40,000)	60,000	1,24,000
Cost of sales		***2,80,000***
Profit (Sales – Cost of sales)		***40,000***

(d) Profit for the Quarter (Marginal costing)

Activity Level	***₹***	***₹***
Sales revenue (160 units × ₹2,000)		3,20,000
Production costs:		
Variable (220 units × ₹800)		1,76,000
Cost of production		***1,76,000***
Add: Opening stock		Nil
Less: Closing stock (₹1,76,000 ÷ 220 units) × 60 units		(48,000)

Cost of goods sold		***1,28,000***
Add: Selling and distribution costs:		
Variable (160 units × ₹400)		64,000
Cost of sales		***1,92,000***
Contribution (Sales – Variable Cost of sales)		***1,28,000***
Less: Fixed costs:		
Production	40,000	
Selling & distribution	60,000	(1,00,000)
Profit		***28,000***

(e) Difference in profit between both techniques is due to difference in valuation of closing stock:

Profit as per Marginal costing	28,000
Add: under valuation of closing stock in marginal costing (60,000 – 48,000)	12,000
Profit as per Absorption costing	***40,000***

OTHERS

BQ 37

Arnav Ltd. manufacture and sales its product R9. The following figures have been collected from cost records of last year for the product R9:

Elements of Cost	Variable Cost Portion	Fixed Cost
Direct Material	30% of Cost of Goods Sold	-
Direct Labour	15% of Cost of Goods Sold	-
Factory Overhead	10% of Cost of Goods Sold	₹2,30,000
Administration Overhead	2% of Cost of Goods Sold	₹71,000
Selling and Distribution Overhead	4% of Cost of Sales	₹68,000

Last Year 5,000 units were sold at ₹185 per unit. From the given data find the followings:

(a) Break-even Sales (in rupees),
(b) Profit earned during last year,
(c) Margin of safety (in %),
(d) Profit if the sales were 10% less than the actual sales.
(Assume that Administration Overhead is related with production activity)

Answer

(a) Break-even Sales = Fixed Cost ÷ PV Ratio
= ₹3,69,000 ÷ 53.4054% = ***₹6,90,941***

(b) Profit Last Year = Sales – Variable Cost - Fixed Cost
= 5,000 units × ₹185 – ₹4,31,000 – ₹3,69,000 = ***₹1,25,000***

(c) Margin of safety (%)

Margin of Safety = Sales – BEP Sales
= ₹9,25,000 – ₹6,90,941 = ***₹2,34,059***

Margin of Safety (%) = MOS Sales ÷ Sales
= ₹2,34,059 ÷ ₹9,25,000 = ***25.3036%***

(d) Profit at 90% Sales = 90% of Sales – 90% of Variable Cost - Fixed Cost
= 90% (₹9,25,000 – ₹4,31,000) – ₹3,69,000 = ***₹75,600***

Working notes:

1. Cost of Goods Sold = Direct Material + Direct Labour + Factory OH + Administration OH
= 30% COGS + 15% COGS + 10% COGS + ₹2,30,000 + 2% COGS +₹71,000

Cost of Goods Sold = 57% of COGS + ₹3,01,000 or 43% of COGS = ₹3,01,000

Cost of Goods Sold = ₹3,01,000 ÷ 43% = ***₹7,00,000***

2. Cost of Sales = COGS + Selling and Distribution Overheads
= ₹7,00,000 + 4% of Cost of Sales + ₹68,000

Cost of Sales = ₹7,68,000 ÷ 96% = ***₹8,00,000***

3. Classification of Fixed and Variable Cost

Elements of Cost	***Variable Cost Portion***	***Fixed Cost***
Direct Material	30% of ₹7,00,000 = ₹2,10,000	-
Direct Labour	15% of ₹7,00,000 = ₹1,05,000	-
Factory Overhead	10% of ₹7,00,000 = ₹70,000	₹2,30,000
Administration Overhead	2% of ₹7,00,000 = ₹14,000	₹71,000
Selling and Distribution Overhead	4% of ₹8,00,000 = ₹32,000	₹68,000
Total	***₹4,31,000***	***₹3,69,000***

4. Profit Volume Ratio = $\frac{\text{Sales} - \text{Variable Cost}}{\text{Sales}} \times 100$ = $\frac{5{,}000 \text{ units} \times 185 - 4{,}31{,}000}{5{,}000 \text{ units} \times 185} \times 100$

= ***53.4054%***

BQ 38

By noting "P/V will increase or P/V will decrease or P/V will not change", as the case may be, state how the following independent situations will affect the P/V ratio:

1. An increase in the physical sales volume;
2. An increase in the fixed cost;
3. A decrease in the variable cost per unit;
4. A decrease in the contribution margin;
5. An increase in selling price per unit;
6. A decrease in the fixed cost;
7. A 10% increase in both selling price and variable cost per unit;
8. A 10% increase in the selling price per unit and 10% decrease in the physical sales volume;
9. A 50% increase in the variable cost per unit and 50% decrease in the fixed cost.
10. An increase in the angle of incidence.

Answer

Item number	***P/V Ratio***	***Reason***
1	Will not change	-
2	Will not change	-
3	Will increase	-
4	Will decrease	-
5	Will increase	-
6	Will not change	-
7	Will not change	Reasoning 1
8	Will increase	Reasoning 2
9	Will decrease	Reasoning 3
10	Will increase	Reasoning 4

Reasoning 1: A 10% increase in both selling price and variable cost per unit.

Assumptions: a) Variable cost is less than selling price.
b) Selling price ₹100 variable cost ₹ 90 per unit.

c) P/V ratio = $\frac{100-90}{100}$ = 10%

10% increase in S.P.	=	₹110
10% increase in variable cost	=	₹99
P/V ratio	=	10% i.e. P/V ratio will not change

Reasoning 2: Increase or decrease in physical sales volume will not change P/V ratio. Hence 10% increase in selling price per unit will increase P/V ratio.

Reasoning 3: Increase or decrease in fixed cost will not change P/V ratio. Hence 50% increase in the variable cost per unit will decrease P/V ratio.

Reasoning 4: Angle of incidence is the angle at which sales line cuts the total cost line. If it is large, it indicates that the profits are being made at higher rate. Hence increase in the angle of incidence will increase the P/V ratio.

BQ 39

XY Ltd. makes two products X and Y, whose respective fixed costs are F1 and F2. You are given that the unit contribution of Y is one fifth less than the unit contribution of X, that the total of F1 and F2 is ₹1,50,000, that the BEP of X is 1,800 units (for BEP of X F2 is not considered) and that 3,000 units is the indifference point between X and Y. (i.e. X and Y make equal profits at 3,000 unit volume, considering their respective fixed costs). There is no inventory build up as whatever is produced is sold.

Find out the values F1 and F2 and units contributions of X and Y.

Answer

Let Cx be the Contribution per unit of Product X.

Therefore, Contribution per unit of Product Y = Cy = ⅘ Cx = 0.8 Cx

Given F1 + F2	=	1,50,000,		
F1	=	1,800 Cx (Break even Volume × Contribution per unit)		
Therefore, F2	=	1,50,000 – 1,800 Cx		
3,000 Cx – F1	=	3,000 × 0.8 Cx – F2 or 3,000 Cx – F1		
	=	2,400 Cx - F2		(Indifference Point)
i.e., 3,000 Cx – 1,800 Cx	=	2,400 Cx – 1,50,000 + 1,800 Cx		
i.e., 3,000 Cx	=	1,50,000,		
Cx	=	1,50,000 ÷ 3,000	=	₹50
Contribution per unit of X	=	***₹50***		
Contribution per unit of Y	=	₹50 × 0.8	=	***₹40***
Fixed Cost of X	=	F1		
	=	1,800 × 50	=	***₹90,000***
Fixed Cost of Y	=	F2		
	=	1,50,000 – 90,000	=	***₹60,000***

PAST YEAR QUESTIONS

PYQ 1

SHA Limited provides the following trading results:

Year	Sales	Profit
2012-13	₹25,00,000	10% of Sale
2013-14	₹20,00,000	8% of Sale

You are required to calculate:

(i) Fixed Cost
(ii) Break Even Point
(iii) Amount of profit, if sale is ₹30,00,000
(iv) Sale, when desired profit is ₹4,75,000
(v) Margin of Safety at a profit of ₹2,70,000

[(5 Marks) May 2014]

Answer

(i) Calculation of Fixed Cost (by using data of year 2012-13):

Fixed cost = Contribution – profit = (Sales × PV Ratio) - 10% of Sale
= (₹25,00,000 × 18%) - 10% of ₹25,00,000 = **₹2,00,000**

(ii) Calculation of Break Even Point:

$$\text{BEP} = \frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{2,00,000}{18\%} = ₹11,11,111.11$$

(iii) Calculation of Amount of profit, if Sale is ₹30,00,000:

Profit = Contribution - Fixed Cost
= ₹30,00,000 × 18% - 2,00,000 = **₹3,40,000**

(iv) Sales, when desired profit is ₹4,75,000:

$$\text{Sales} = \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV Ratio}} = \frac{2,00,000 + 4,75,000}{18\%}$$

= **₹37,50,000**

(v) Margin of Safety at a profit of ₹2,70,000:

$$\text{MOS} = \frac{\text{Profit}}{\text{PV Ratio}} = \frac{2,70,000}{18\%} = ₹15,00,000$$

Working Note:

$$\text{PV Ratio} = \frac{\text{Difference in Profit}}{\text{Difference in Sales}} \times 100 = \frac{10\% \text{ of } 25,00,000 - 8\% \text{ of } 20,00,000}{25,00,000 - 20,00,000} \times 100$$

$$= \frac{90,000}{5,00,000} \times 100 = 18\%$$

PYQ 2

ABC Limited started is operation in the year 2013 with the total production capacity of 2,00,000 units. The following information, for two years, are made available to you:

	2013	2014
Sales units	80,000	1,20,000
Total cost (₹)	34,40,000	45,60,000

There has been no change in the cost structure and selling price and it is anticipated that it will remain unchanged in 2015 also. Selling price is ₹40 per unit.

Calculate:

(a) Variable cost per unit.
(b) Profit Volume ratio.
(c) Break-Even Point (in units).
(d) Profit if the firm operates at 75% of the capacity.

[(5 Marks) May 2015]

Answer

(a) Variable cost per unit = $\frac{\text{Increase in Cost}}{\text{Increase in Units}}$ = $\frac{45,60,000 - 34,40,000}{1,20,000 - 80,000}$

= ***₹28 per unit***

(b) Profit Volume ratio = $\frac{\text{Contribution per unit}}{\text{Sale price per unit}} \times 100$ = $\frac{40-28}{40} \times 100$

= ***30%***

(c) Break Even Point (in units) = $\frac{\text{Fixed Cost}}{\text{Cont}^{n}\text{ P.U.}}$ = $\frac{12,00,000}{12}$ = ***1,00,000 units***

(d) Profit at 75% of total capacity:

Profit = (No. of units sold × Cont^{n} per unit) – Fixed cost
= (2,00,000 × 75% × ₹12) - 12,00,000 = ***₹6,00,000***

Working Note:

Fixed Cost = Total cost – Variable cost (by using data of 2013)
= 34,40,000 – (80,000 × 28) = ***12,00,000***

PYQ 3

SL Limited is engaged in manufacture of tyres. Analysis of income statement indicated a profit of ₹150 Lakhs on a sales volume of 50,000 units. The fixed costs are ₹850 Lakhs which appears to be high. Existing selling price is ₹3,400 per unit. The company is considering to revise the target profit to ₹350 Lakhs.

You are required to compute:

(i) Break even point at existing levels in units and in rupees.
(ii) The number of units required to be sold to earn the target profit.
(iii) Profit with 15% increase in selling price and drop in sales volume by 10%
(iv) Volume to be achieved to earn target profit at revised selling price as calculated in ***(iii)*** above, if reduction of 8% in the variable costs and ₹85 Lakhs in the fixed cost is envisaged.

[(8 Marks) June 2015]

Answer

(i) Break even point (in units) = $\frac{\text{Fixed Cost}}{\text{Contribution Per Unit}}$ = $\frac{850 \text{ Lakhs}}{2,000}$ = ***42,500 Units***

Break even point (in rupees) = BEP in Units × Sales Price Per Unit

= 42,500 × ₹3,400 = ***₹1,445 Lakhs***

(ii) Sales to earn target profit = $\frac{\text{Fixed Cost + Target Profit}}{\text{Contribution Per Unit}}$ = $\frac{850 \text{ Lakhs} + 350 \text{ Lakhs}}{2{,}000}$

= ***60,000 Units***

(iii) Revised Profit = Revised Contribution – Fixed Cost
= [₹2,510 × 45,000 units (50,000 – 10%)] - 850 Lakhs
= ***₹279.5 Lakhs***

(iv) Volume to earn target profit = $\frac{\text{Revised Fixed Cost + Target Profit}}{\text{Revised Contribution Per Unit}}$

= $\frac{765 \text{ Lakhs} + 350 \text{ Lakhs}}{2{,}622}$ = ***42,524.79 Units***

Working Note:

(a) Calculation of Contribution per unit and PV Ratio:

Contribution	=	Fixed Cost + Profit		
	=	850 Lakhs + 150 Lakhs	=	1,000 Lakhs
Contribution Per Unit	=	Total Contribution ÷ No of units		
	=	1,000 Lakhs ÷ 50,000 units	=	₹2,000 per unit

(b) Calculation of Revised Contribution with 15% increase in sale price:

Revised Contribution	=	Revised Sale Price – Variable Cost		
	=	(3,400 + 15%) – 1,400	=	₹2,510 per unit

(c) Calculation of Revised Variable Cost per unit, Revised Contribution per unit and Fixed Cost:

Revised Variable Cost	=	Variable Cost – 8%		
	=	1,400 – 8%	=	₹1,288 per unit
Revised Contribution per unit	=	(3,400 + 15%) – 1,288	=	₹2,622 per unit
Revised Fixed Cost	=	850 Lakhs – 85 Lakhs	=	₹765 Lakhs

PYQ 4

A company gives the following information:

Margin of safety	:	₹3,75,000
Total cost	:	₹3,87,500
Margin of safety in units	:	15,000 units
Break even sales in units	:	5,000 units

You are required to calculate:

(i) Selling price per unit, ***(ii)*** Profit, ***(iii)*** Profit/Volume ratio, ***(iv)*** Break even sales (in ₹), ***(v)*** Fixed cost

[(5 Marks) Nov 2015]

Answer

(i) Selling price per unit = $\frac{\text{Margin of safety in rupees}}{\text{Margin of safety in units}}$ = $\frac{3{,}75{,}000}{15{,}000}$ = ***₹25***

(ii) Profit = Total sales – Total cost
= [(15,000 + 5,000) × 25] – 3,87,500 = ***₹1,12,500***

(iii) Profit/Volume ratio = $\frac{\text{Profit}}{\text{Margin of safety in rupees}} \times 100$ = $\frac{1,12,500}{3,75,000} \times 100$

= ***30%***

(iv) Break even sales in rupees = Break even point in units × sale price per unit

= 5,000 units × 25 = ***₹1,25,000***

(v) Fixed cost = Break even point in rupees × PV ratio

= 1,25,000 × 30% = ***₹37,500***

PYQ 5

A dairy product company manufacturing baby food with a shelf life of one year furnishes the following information:

(i) On 1st January, 2016, the company has an opening stock of 20,000 packets whose variable cost is ₹180 per packet.

(ii) In 2015, production was 1,20,000 packets and the expected production in 2016 is 1,50,000 packets. Expected sales for 2016 is 1,60,000 packets.

(iii) In 2015, fixed cost per unit was ₹60 and it is expected to increase by 10% in 2016. The variable cost is expected to increase by 25%. Selling price for 2016 has been fixed at ₹300 per packet.

You are required to calculate the Break-even volume in units for 2016.

[(5 Marks) May 2016]

Answer

Break-even-point (in units) = Opening units + $\frac{\text{Fixed cost} - \text{Contribution from opening units}}{\text{Contribution per current period unit}}$

= 20,000 units + $\frac{79,20,000 - 120 \times 20,000}{300 - 225}$ = ***93,600 Units***

Note: Since, shelf life of the product is one year only, hence, opening stock is to be sold first.

Working notes:

Fixed cost (2015) = 1,20,000 packets × ₹60 per unit = ***₹72,00,000***

Fixed cost (2016) = ₹72,00,000 + 10% = ***₹79,20,000***

Variable cost (2016) = ₹180 + 25% = ***₹225 per unit***

Contribution (2015) = ₹300 - ₹180 = ***₹120 per unit***

PYQ 6

The M-Tech Manufacturing Company is presently evaluating two possible processes for the manufacture of a toy. The following information is available:

Particulars	*Process A (₹)*	*Process B (₹)*
Variable cost per unit	12	14
Sales price per unit	20	20
Total fixed cost per year	30,00,000	21,00,000
Capacity (in units)	4,30,000	5,00,000
Anticipated sales (next year, in units)	4,00,000	4,00,000

Suggest:

1. Which process should be chosen?
2. Would you change your answer as given above, if you were informed that the capacities of the two processes are as follows: A - 6,00,000 units; B - 5,00,000 units? Why?

[(4 Marks) May 2016]

Answer

1. ***Profit (Process A)*** = Contribution – Fixed cost
   = 4,00,000 units × ₹8 (₹20 - ₹12) – ₹30,00,000 = ***₹2,00,000***

   Profit (Process B) = Contribution – Fixed cost
   = 4,00,000 units × ₹6 (₹20 - ₹14) – ₹21,00,000 = ***₹3,00,000***

Suggestion: Process B should be chosen as it gives more profit.

2. ***Profit (Process A)*** = Contribution – Fixed cost
   = 6,00,000 units × ₹8 (₹20 - ₹12) – ₹30,00,000 = ***₹18,00,000***

   Profit (Process B) = Contribution – Fixed cost
   = 5,00,000 units × ₹6 (₹20 - ₹14) – ₹21,00,000 = ***₹9,00,000***

Suggestion: Process A should be chosen as it will give more profit.

Note: It is assumed that capacity produced equals sales.

PYQ 7

The following figures are available from the records of ABC Company as at 31st March:

	2015 (₹in Lakhs)	***2016 (₹in Lakhs)***
Sales	200	250
Profit	30	45

Calculate:

1. The P/V ratio and total fixed expenses.
2. The break-even level of sales.
3. Sales required to earn a profit of ₹70 lakhs.

[(5 Marks) Nov 2016]

Answer

1. ***Profit Volume ratio*** = $\frac{\text{Increase in Profit}}{\text{Increase in Sales}} \times 100$ = $\frac{45-30}{250-200} \times 100$ = ***30%***

   Fixed Cost = Contribution – Profit (by using data of 2015)
   = 200 Lakhs × 30% – 30 Lakhs = ***₹30,00,000***

2. ***Break Even Point*** = $\frac{\text{Fixed Cost}}{\text{PV Ratio}}$ = $\frac{30,00,000}{30\%}$
   = ***₹1,00,00,000***

3. ***Required Sales*** = $\frac{\text{Fixed Cost + Profit}}{\text{PV Ratio}}$ = $\frac{30\text{ Lakhs}+70\text{Lakhs}}{30\%}$
   = ***₹3,33,33,333***

PYQ 8

A company has introduced a new product and marketed 20,000 units. Variable cost of the product is ₹20 per units and fixed overheads are ₹3,20,000.

You are required to:

1. Calculate selling price per unit to earn a profit of 10% on sales value, BEP and Margin of Safely?
2. If the selling price is reduced by the company by 10%, demand is expected to increase by 5,000 units, then what will be its impact on Profit, BEP and Margin of Safety?
3. Calculate Margin of Safety if profit is ₹64,000.

[(8 Marks) Nov 2016]

Answer

1. *Sales:*

Let Sale price per unit be 'x'

Sale price × no of units	=	Variable cost per unit × no of units + Fixed cost + Profit		
20,000 x	=	20 × 20,000 + 3,20,000 + 10% of 20,000 x		
20,000 x	=	4,00,000 + 3,20,000 + 2,000 x		
x	=	7,20,000 ÷ 18,000	=	***₹40 per unit***
Break-even-point	=	Fixed cost ÷ Contribution per unit		
	=	3,20,000 ÷ 20	=	***16,000 units***
Margin of safety	=	Total sales unit – BEP units		
	=	20,000 units – 16,000 units	=	***4,000 units***

2. *Impact on Profit, BEP and MOS:*

Impact on profit:

Existing profit	=	Sales – Variable cost – Fixed cost		
	=	20,000 units × 40 – 20,000 units × 20 – 3,20,000		
	=	80,000		
Revised profit	=	Sales – Variable cost – Fixed cost		
	=	25,000 units × 36 (40 – 10%) – 25,000 units × 20 – 3,20,000		
	=	80,000		

Though there is no impact on the total profit amount but the rate of profit is decreased from 10% to 8.89% (80,000/9,00,000 × 100).

Impact on BEP:

Revised BEP	=	Fixed cost ÷ Contribution per unit		
	=	3,20,000 ÷ 16 (36 - 20)	=	***20,000 units***

The Break-even point is increased by 4,000 units (20,000 units – 16,000 units).

Impact on MOS:

Revised MOS	=	Total sales unit – BEP units		
	=	25,000 units – 20,000 units	=	***5,000 units***

Margin of safety is increased by 1,000 units (5,000 units – 4,000 units).

3. *Margin of Safety when, profit ₹64,000:*

Margin of safety	=	Profit ÷ Contribution per unit		
	=	64,000 ÷ 20	=	***3,200 units***

PYQ 9

The following information was obtained from the records of a manufacturing unit:

Particulars	(₹)	(₹)
Sales 80,000 units @ ₹25 per unit		20,00,000
Materials consumed	8,00,000	
Variable overheads	2,00,000	
Labour charges	4,00,000	
Fixed overheads	3,60,000	17,60,000
Net profit		2,40,000

Calculate:

1. The number of units by selling which the company will neither lose nor gain anything.
2. The sales needed to earn a profit of 20% on sales.
3. The extra units which should be sold to obtain the present profit if it is proposed to reduce the selling price by 20% and 25%.
4. The selling price to be fixed to bring down its Break-even Point to 10,000 units under present conditions. **[(8 Marks) May 2017]**

Answer

1. Break-even-point (in units) = Fixed cost ÷ Contribution per unit

= 3,60,000 ÷ 7.50 = **48,000 units**

2. Required sales (in units)

$$= \frac{\text{Fixed cost}}{\text{Contribution per unit} - \text{Profit per unit}}$$

$$= \frac{3,60,000}{7.50 - 20\% \text{ of } 25.00} = \textbf{1,44,000 units/ ₹36,00,000}$$

3. Calculation of Extra units to be sold:

No. of units sold with 20% decrease in sales price

$$= \frac{\text{Fixed cost} + \text{Profit}}{\text{Revised contribution per unit}} = \frac{3,60,000 + 2,40,000}{2.50}$$

= 2,40,000 units

Extra units to be sold = 2,40,000 – 80,000 = **1,60,000 units**

No. of units sold with 20% decrease in sales price

$$= \frac{\text{Fixed cost} + \text{Profit}}{\text{Revised contribution per unit}} = \frac{3,60,000 + 2,40,000}{1.25}$$

= 4,80,000 units

Extra units to be sold = 4,80,000 – 80,000 = **4,00,000 units**

4. Selling price per unit to bring down its BEP to 10,000 units:

At BEP, Sales Value = Variable Cost + Fixed Cost

= 10,000 units × ₹17.50 + ₹3,60,000 = ₹5,35,000

Sales value for 10,000 units = ₹5,35,000

Sales price per unit = ₹5,35,000 ÷ 10,000 units = **₹53.50**

PYQ 10

A company, with 90% Capacity utilization, is manufacturing a product and makes a sale of ₹9,45,000 at ₹30 per unit. The cost data is as under:

Materials	₹9 per unit
Labour	₹7 per unit
Semi variable cost (including variable cost ₹4.25 per unit)	₹2,10,000

Fixed cost is ₹94,500 upto 90% level of output (capacity). Beyond this, an additional amount of ₹15,000 will be incurred.

You are required to calculate:

(1) Level of output at break-even point,
(2) Number of units to be sold to earn a net income of 10% of sales and
(3) Level of output needed to earn a profit of ₹1,41,375.

[(8 Marks) Nov 2017]

Answer

(1) Break-even-point (in units) = Fixed cost ÷ Contribution per unit
= ₹1,70,625 ÷ ₹9.75 = ***17,500 units***

Break-even-point (in ₹) = 17,500 units × ₹30 = ***₹5,25,000***

(2) Required sales (in units) = $\frac{\text{Fixed cost}}{\text{Contribution per unit} - \text{Profit per unit}}$

= $\frac{1,70,625}{9.75 - 10\% \text{ of } 30}$ = ***25,278 units***

(3) Required sales (in units) = $\frac{\text{Fixed cost} + \text{Profit}}{\text{Contribution per unit}}$

= $\frac{1,70,625 + 1,41,375}{9.75}$ = 32,000 units

Note: 32,000 units is higher than 90% activity level (31,500 units), therefore now fixed cost will be ₹1,85,625 (₹1,70,625 + ₹15,000)

Required sales (in units) = $\frac{\text{Fixed cost} + \text{Profit}}{\text{Contribution per unit}}$ = $\frac{1,85,625 + 1,41,375}{9.75}$

= ***33,538.46 units or ₹10,06,154***

Working notes:

Existing level of sales (90% capacity level) = ₹9,45,000 ÷ ₹30 = 31,500 units

Fixed cost in semi variable cost = Total semi variable cost – variable cost
= ₹2,10,000 – 31,500 × ₹4.25 = ₹76,125

Fixed cost = ₹94,500 + ₹76,125 = ₹1,70,625

Contribution per unit = ₹30 - ₹9 - ₹7 - ₹4.25 = ₹9.75

PYQ 11

A company is producing an identical product in two factories. The following are the details in respect of both factories:

Particulars	***Factory X***	***Factory Y***
Sales price per unit (₹)	50	50
Variable cost per unit (₹)	40	35
	2,00,000	3,00,000

Fixed cost (₹)	40,000	30,000
Depreciation included in above fixed cost (₹)	30,000	20,000
Sales in units	40,000	30,000
Production capacity (units)		

You are required to determine:

(1) Break even point (BEP) each factory individually.
(2) Cash break even point for each factory individually.
(3) BEP for company as a whole, assuming the present product mix is in sales ratio.
(4) Consequence on profit and BEP if product mix is changed to 2 : 3 and total demand remain same.

[(8 Marks) May 2018]

Answer

(1) Individual BEP:

Factory X = Fixed cost ÷ Contribution per unit
= 2,00,000 ÷ 10 (50 - 40) = ***20,000 units***

Factory Y = 3,00,000 ÷ 15 (50 - 35) = ***20,000 units***

(2) Individual Cash BEP:

Factory X = Cash fixed cost ÷ Contribution per unit
= 1,60,000 ÷ 10 (50 - 40) = ***16,000 units***

Factory Y = 2,70,000 ÷ 15 (50 - 35) = ***18,000 units***

(3) BEP as a whole: = Total fixed cost ÷ Composite contribution per unit
= (2,00,000 + 3,00,000) ÷ 12 ($10 \times {}^{3}/_{5} + 15 \times {}^{2}/_{5}$)
= ***41,667 units***

(4) BEP as a whole:

Total demand original = 30,000 of X + 20,000 of Y = 50,000 units

Revised sales X = $50,000 \times {}^{2}/_{5}$ = 20,000 units

Revised sales Y = $50,000 \times {}^{3}/_{5}$ = 30,000 units

Existing Profit = Contribution – Fixed cost
= (30,000 × 10 + 20,000 × 15) – (2,00,000 + 3,00,000)
= ₹1,00,000

Revised Profit = (20,000 × 10 + 30,000 × 15) – (2,00,000 + 3,00,000)
= ₹1,50,000

Consequence on Profit = ***Increase in Profit by ₹50,000***

Revised BEP = Total fixed cost ÷ Revised composite contribution per unit
= (2,00,000 + 3,00,000) ÷ 13 ($10 \times {}^{2}/_{5} + 15 \times {}^{3}/_{5}$)
= 38,462 units

Consequence on BEP = ***Decrease in BEP by 3,205 units***

PYQ 12

Following figures have been extracted from the books of M/s. RST Private Limited:

Year	***Sales***	***Profit***
2016-17	₹4,00,000	15,000 (loss)
2017-18	₹5,00,000	15,000 (profit)

You are required to calculate:

(1) Profit Volume Ratio
(2) Fixed Costs
(3) Break Even Point
(4) Sales required to earn a profit of ₹45,000
(5) Margin of Safety in financial year 2017-2018. ***[(5 Marks) May 2018]***

Answer

(a) PV Ratio $= \frac{\text{Difference in Profit}}{\text{Difference in Sales}} \times 100 = \frac{30,000}{1,00,000} =$ ***30%***

(b) Calculation of Fixed Cost (by using data of year 2017-18):

Fixed cost = Contribution – profit
= 5,00,000 × 30% - 15,000 = ***₹1,35,000***

(c) Calculation of Break Even Point:

BEP $= \frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{1,35,000}{30\%} =$ ***₹4,50,000***

(d) Sales required to earn ₹45,000:

Sales $= \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{PV Ratio}} = \frac{1,35,000 + 45,000}{30\%}$
= ***₹6,00,000***

(e) Margin of Safety in financial year 2017-2018:

MOS $= \frac{\text{Profit}}{\text{PV Ratio}} = \frac{15,000}{30\%} =$ ***₹50,000***

PYQ 13

A manufacturing concern was operating at margin of safety of 40% in the year 2018 and was selling its product at ₹75 per unit. Variable cost ratio was 80% and fixed cost amounted to ₹5,40,000.

In the year 2019, the concern anticipates an increase in the variable costs and fixed cost by 15% and 5% respectively.

You are required to:

Find out the selling price to be fixed in the year 2019 keeping in view that concern is willing to maintain same P/V ratio as it was in the year 2018.

[(5 Marks) Nov 2018]

Answer

Variable cost (2018)	=	₹75 × 80%	=	₹60 per unit
Variable cost (2019)	=	₹60 + 15%	=	₹69 per unit
Sale Price to maintain same PV Ratio	=	₹69 ÷ 80%	=	***₹86.25 p.u.***

PYQ 14

A manufacturing company is providing a product 'A' which is sold in the market at ₹45 per unit. The company has the capacity to produce 40,000 units per year. The budget for the year 2018-2019 projects a sale of 30,000 units.

The cost of each unit are expected as under:

Materials	₹12
Wages	₹9
Overheads	₹6

Margin of safety is ₹4,12,500.

You are required to:

(1) Calculate fixed cost and break-even point.
(2) Calculate the volume of sales to earn profit of 20% on sales.
(3) If management is willing to invest 10,00,000 with the expected return of 20%, calculate units to be sold to earn this profit.
(4) Management expects additional sales if the selling price is reduced to ₹44. Calculate units to be sold to achieve the same profit as desired in above ***(3)***.

[(10 Marks) Nov 2018]

Answer

(1) Fixed cost = BEP sales × P/V ratio
= ₹9,37,500 × 40% = ***₹3,75,000***

Break-even point = Total sales – Margin of safety
= 30,000 units × ₹45 – ₹4,12,500 = ***₹9,37,500***

P/V ratio = (Contribution ÷ Sales) × 100
= [{45 – (12 + 9 + 6)} ÷ 45] × 100
= (18 ÷ 45) × 100 = ***40%***

(2) Sales to earn 20% on sales = $\frac{\text{Fixed Cost + Profit}}{\text{P/V Ratio}} = \frac{3,75,000 + 20\% \text{ Sales}}{40\%}$
= ***₹18,75,000 or 41,667 units***

(3) Sales in units = $\frac{\text{Fixed Cost + Profit}}{\text{Contribution p.u.}} = \frac{3,75,000 + 20\% \text{ on } 10,00,000}{18}$
= ***31,945 units***

(4) Calculation of units to be sold to earn same profit as in (3) with revised sale price:

Revised sales = $\frac{\text{Fixed Cost + Profit}}{\text{Revised Contribution p.u.}} = \frac{3,75,000 + 2,00,000}{17}$
= ***33,824 units***

PYQ 15

When volume is 4,000 units, average cost is ₹3.75 per unit. When volume is 5,000 units, average cost is ₹3.50 per unit. The break-even point is 6,000 units.

Calculate:

(1) Variable Cost per unit
(2) Fixed Cost and
(3) Profit Volume Ratio.

[(5 Marks) Nov 2019]

Answer

(1) Variable Cost per unit = $\frac{\text{Change in Cost}}{\text{Change in Units}} = \frac{5,000 \times 3.50 - 4,000 \times 3.75}{5,000 - 4,000}$

$$= \frac{17,500 - 15,000}{1,000} = \textbf{₹2.50 per unit}$$

(2) Fixed Cost = Total Cost – Variable Cost
= 4,000 × ₹3.75 – 4,000 × ₹2.50 (using 4,000 units as base)
= ₹15,000 – ₹10,000 = ***₹5,000***

(3) Profit Volume Ratio $= \frac{\text{Fixed Cost}}{\text{BEP Sales}} \times 100 = \frac{5,000}{20,000} \times 100$
= ***25%***

Working Note:

BEP sales = Fixed Cost + Variable Cost
= 5,000 + 6,000 units × ₹2.50 = ***₹20,000***

PYQ 16

Moon Ltd. produces products 'X', 'Y', 'Z' and has decided to analyse it's production mix in respect of these three products: 'X', 'Y', 'Z'.

You have the following information:

	X	*Y*	*Z*
Direct Material ₹ (per unit)	160	120	80
Variable Overheads ₹ (per unit)	8	20	12
Direct Labour:			

Departments:	*Rate per hour (₹)*	*Hours per unit X*	*Hours per unit Y*	*Hours per unit Z*
Department A	4	6	10	5
Department B	8	6	15	11

From the current budget, further details are as below:

Particulars	*X*	*Y*	*Z*
Annual production at present (in units)	10,000	12,000	20,000
Estimated selling price per unit (₹)	312	400	240
Sales departments estimate of possible sales in the coming year (in units)	12,000	16,000	24,000

There is constraint on supply of labour in Department A and its manpower cannot be increased beyond its present level.

Required:

(i) Identify the best possible product mix of Moon Ltd.
(ii) Calculate the total contribution from the best possible product mix.

[(5 Marks) Nov 2020]

Answer

(i) Statement Showing Best Possible Mix of Moon Ltd.

Rank	*Product*	*Units/Mix*	*Labour hours dept. A*
I	Product X	12,000	72,000
II	Product Y	16,000	1,60,000
III	Product Z (48,000 ÷ 5)	9,600	48,000 (b.f.)
Total		*37,600*	*2,80,000*

Best possible mix of X, Y, Z is 12,000 : 16,000 : 9,600

(ii) Calculation of contribution from best possible mix:

Total contribution = 12,000 units of X × 72 + 16,000 units of Y × 100 + 9,600 units of Z × 40
= ***₹28,48,000***

Working note:

(1) Calculation of total available labour hours in department A:

Total available labour hours = 10,000 units of X × 6 hours + 12,000 units of Y × 10 hours + 20,000 units of Z × 5 hours
= 2,80,000 hours

(2) Calculation of Contribution per labour hour of department A and Rank:

Particulars	***X***	***Y***	***Z***
Sale price per unit	312	400	240
Less: Direct materials per unit	160	120	80
Less: Variable overheads per unit	8	20	12
Less: Wages per unit:			
Department A	24 (6 × 4)	40 (10 × 4)	20 (5 × 4)
Department B	48 (6 × 8)	120 (15 × 8)	88 (11 × 8)
Contribution per unit	72	100	40
÷ Labour hours per unit of Dept. A	÷ 6	÷ 10	÷ 5
Contribution per labour hour Dept. A	12	10	8
Rank	***I***	***II***	***III***

PYQ 17

During a particular period ABC Ltd has furnished the following data:

Sales	₹10,00,000
Contribution to sales ratio	37%
Margin of safety is	25% of sales

A decrease in selling price and decrease in the fixed cost could change the "contribution to sales ratio" to 30% and "margin of safety" to 40% of the revised sales.

Calculate:

(1) Revised Fixed Cost.
(2) Revised Sales and
(3) New Break-Even Point.

[(5 Marks) Jan 2021]

Answer

Contribution to sales ratio (P/V ratio)	=	37%		
Variable cost ratio	=	100% - 37%	=	63%
Variable cost	=	₹10,00,000 × 63%	=	₹6,30,000

After decrease in selling price and fixed cost, sales quantity has not changed. Thus, variable cost is ₹6,30,000.

Revised Contribution to sales = 30%

Thus, Variable cost ratio	=	100% - 30%	=	70%
Thus, Revised sales	=	₹6,30,000 ÷ 70%	=	₹9,00,000
Revised Margin of Safety	=	40%		
Thus, Revised Break-even to sales ratio	=	100% - 40%	=	60%

(1) Revised Fixed Cost = Revised break-even sales × Revised P/V Ratio
= (₹9,00,000 × 60%) × 30% = ***₹1,62,000***

(2) Revised Sales = ***₹9,00,000 (as calculated above)***

(3) New BEP = Revised sales × Revised break-even sales ratio
= ₹9,00,000 × 60% = ***₹5,40,000***

PYQ 18

Two manufacturing companies A and B are planning to merge. The details are as follows:

	A	*B*
Capacity utilisation (%)	90	60
Sales (₹)	63,00,000	48,00,000
Variable Cost (₹)	39,60,000	22,50,000
Fixed Cost (₹)	13,00,000	15,00,000

Assuming that the proposal is implemented, calculate:

(1) Break-Even sales of the merged plant and the capacity utilization at that stage.
(2) Profitability of the merged plant at 80% capacity utilization.
(3) Sales Turnover of the merged plant to earn a profit of ₹60,00,000.
(4) When the merged plant is working at a capacity to earn a profit of ₹60,00,000, what percentage of increase in selling price is required to sustain an increase of 5% in fixed overheads.

[(10 Marks) Jan 2021]

Answer

(a) Break-Even sales of the merged plant and the capacity utilization at that stage:

Break-Even Sales = Fixed Cost ÷ P/V Ratio
= ₹28,00,000 ÷ 45.67% = ***₹61,30,939***

Capacity Utilization = (BEP Sales ÷ Sales at 100% Capacity) × 100
= (₹61,30,939 ÷ ₹1,50,00,000) × 100 = ***40.87%***

(b) Profitability of merged plant at 80% Capacity:

Profit = Contribution – Fixed Cost
= {(₹1,50,00,000 × 80%) × 45.67%} - ₹28,00,000
= ***₹26,80,400***

(c) Sales to earn a profit of ₹60,00,000:

Sales = (Fixed Cost + Profit) ÷ P/V Ratio
= (₹28,00,000 + ₹60,00,000) ÷ 45.67% = ***₹1,92,68,666***

(d) % increase in selling price:

Increase in fixed cost = ₹28,00,000 × 5% = ₹1,40,000

∴ % increase in sales price = (₹1,40,000 ÷ ₹1,92,68,666) × 100 = ***0.727%***

Working Notes:

Calculation of Sales, Variable Cost, P/V Ratio and Fixed Cost at 100% capacity of merged plant:

Sales	=	(₹63,00,000 ÷ 90%) + (₹48,00,000 ÷ 60%)	=	₹1,50,00,000
Variable Cost	=	(₹39,60,000 ÷ 90%) + (₹22,50,000 ÷ 60%)	=	₹81,50,000
P/V Ratio	=	(Contribution ÷ Sales) × 100		
	=	{(₹1,50,00,000 – ₹81,50,000) ÷ ₹1,50,00,000} × 100	=	45.67%
Fixed Cost	=	₹13,00,000 + ₹15,00,000	=	₹28,00,000

PYQ 19

LR Ltd. is considering two alternative methods to manufacture a new product it intends to market. The two methods have a maximum output of 50,000 units each and produce identical items with a selling price of ₹25 each. The costs are:

Particulars	*Method 1 Semi-Automatic*	*Method 2 Fully-Automatic*
Variable cost per unit	₹15	₹10
Fixed costs	₹1,00,000	₹3,00,000

You are required to calculate:

(1) Cost Indifference Points in units, Interpret your results.
(2) The Break-even Points of each method in terms of units.

[(5 Marks) July 2021]

Answer

(1) Cost Indifference Pont = $\frac{\text{Difference in Fixed Costs}}{\text{Difference in Variable Cost per unit}} = \frac{3,00,000 - 1,00,000}{15 - 10}$

= ***40,000 units***

Interpretation:

If expected output < 40,000 units	Select Method 1
If expected output = 40,000 units	Select Any Method
If expected output > 40,000 units	Select Method 2

(2) Break-even Points in units	=	Fixed cost ÷ Contribution per unit		
Method 1	=	1,00,000 ÷ (25 - 15)	=	***10,000 units***
Method 2	=	3,00,000 ÷ (25 - 10)	=	***20,000 units***

PYQ 20

AZ company has prepared its budget for the production of 2,00,000 units. The variable cost per unit is ₹16 and fixed cost is ₹4 per unit. The company fixes its selling price to fetch a profit of 20% on total cost.

You are required to calculate:

1. Present break-even sales (in ₹ and in quantity).
2. Present profit-volume ratio.
3. Revised break-even sales in ₹ and the revised profit-volume ratio, if it reduces its selling price by 10%.

4. What would be revised sales -in quantity and the amount, if a company desires a profit increase of 20% more than the budgeted profit and selling price is reduced by 10% as above in point (iii)

[(10 Marks) Dec 2021]

Answer

1.	Present BEP in ₹	=	Fixed cost ÷ PV Ratio		
		=	(2,00,000 units × ₹4) ÷ 33.33%	=	***₹24,00,000***
	Present BEP in units	=	Fixed cost ÷ Contribution per unit		
		=	₹8,00,000 ÷ ₹8	=	***1,00,000 units***
2.	Present PV Ratio	=	(Contribution ÷ Sales Price) × 100		
		=	(₹8 ÷ ₹24) × 100	=	***33.33%***
3.	Revised BEP in ₹	=	Fixed cost ÷ Revised PV Ratio		
		=	₹8,00,000 ÷ 25.9259%	=	***₹30,85,714***
	Revised PV Ratio	=	(Revised Contribution ÷ Revised Sales Price) × 100		
		=	(₹5.6 ÷ ₹21.6) × 100	=	***25.9259%***
4.	Revised Sales in Quantity=		(Fixed cost + Desired Profit) ÷ Revised Contribution per unit		
		=	(₹8,00,000 + ₹9,60,000) ÷ ₹5.6	=	***3,14,286 units***
	Revised Sales in Amount=		(Fixed cost + Desired Profit) ÷ Revised PV Ratio		
		=	(₹8,00,000 + ₹9,60,000) ÷ 25.9259%	=	***₹67,88,571.42***

Working Notes:

(a)	Present Sale Price	=	Cost p.u. + 20%		
		=	(₹16 + ₹4) + 20%	=	₹24 per unit
(b)	Present Contribution p.u.=		Sale Price p.u. – Variable Cost p.u.		
		=	₹24 – ₹16	=	₹8 per unit
(c)	Revised Sale Price	=	Present Sale Price – 10%		
		=	₹24 – 10%	=	₹21.6 per unit
(d)	Revised Contribution p.u.=		Revised Sales p.u. –Variable Cost p.u.		
		=	₹21.6 – ₹16	=	₹5.6 per unit

PYQ 21

Top-tech a manufacturing company is presently evaluating two possible machines for the manufacture of superior Pen-drives. The following information is available:

Particulars	***Machine A (₹)***	***Machine B (₹)***
Sales price per unit	400	400
Variable cost per unit	240	260
Total fixed cost per year	350 Lakhs	200 Lakhs
Capacity (in units)	8,00,000	10,00,000

Required:

1. Recommend which machine should be chosen?

2. Would you change your answer, if you were informed that the capacities of the two processes are as follows: A - 12,00,000 units; B - 12,00,000 units? Why? ***[(5 Marks) May 2022]***

Answer

1. Profit (Machine A) = Contribution – Fixed cost
= 8,00,000 units × ₹160 (₹400 - ₹240) – ₹3,50,00,000
= ***₹9,30,00,000***

Profit (Machine B) = Contribution – Fixed cost
= 10,00,000 units × ₹140 (₹400 - ₹260) – ₹2,00,00,000
= ***₹12,00,00,000***

Recommendation: Machine B should be chosen as it gives more profit.

2. Profit (Machine A) = Contribution – Fixed cost
= 12,00,000 units × ₹160 (₹400 - ₹240) – ₹3,50,00,000
= ***₹15,70,00,000***

Profit (Machine B) = Contribution – Fixed cost
= 12,00,000 units × ₹140 (₹400 - ₹260) – ₹2,00,00,000
= ***₹14,80,00,000***

Yes, the preference for the machine would change because now, Machine A is having higher contribution and higher profit, hence recommended.

PYQ 22

UV Limited started a manufacturing unit from 1st October 2021. It produces designer lamps and sells its lamps at ₹450 per unit.

During the quarter ending on 31st December, 2021, it produced and sold 12,000 units and suffered a loss of ₹35 per unit.

During the quarter ending on 31st March, 2022, it produced and sold 30,000 units and earned a profit of ₹40 per unit.

You are required to calculate:

(a) Total fixed cost incurred by UV ltd. per quarter.
(b) Break Even sales value (in rupees)
(c) Calculate Profit, if the sale volume reaches 50,000 units in the next quarter (i.e., quarter ending on 30th June, 2022).

[(5 Marks) May 2022]

Answer

(a) Fixed Cost per quarter (by using data of quarter ending 31st March, 2022):

Fixed cost = Contribution – profit
= 30,000 units × 450 × 20% - 30,000 × 40 = ***₹15,00,000***

(b) Calculation of Break Even Point:

$$\textbf{BEP} = \frac{\text{Fixed Cost}}{\text{PV Ratio}} = \frac{15,00,000}{20\%} = ₹75,00,000$$

(c) Calculation of profit at 50,000 units:

Profit = Contribution – Fixed cost
= 50,000 × 450 × 20% - 15,00,000 = ***₹30,00,000***

Working Notes:

$$\textbf{PV Ratio} = \frac{\text{Difference in Profit}}{\text{Difference in Sales}} \times 100 = \frac{30{,}000 \times 40 + 12{,}000 \times 35}{(30{,}000 - 12{,}000) \times 450} = \textbf{20\%}$$

PYQ 23

ABC Ltd, sell its Product 'Y' at a price of ₹300 per unit and its variable cost is ₹180 per unit. The fixed costs are ₹16,80,000 per year uniformly incurred throughout the year, The Profit for the year is ₹7,20,000.

You are required to calculate:

(a) BEP in value (₹) and units.
(b) Margin of Safety
(c) Profits made when sales are 24,000 units,
(d) Sales in value (₹) to be made to earn a net profit of ₹10,00,000 for the year.

[(5 Marks) Nov 2022]

Answer

(a) BEP in value (₹) and units:

BEP in value (₹) = Fixed Cost ÷ P/V Ratio
= ₹16,80,000 ÷ 40% = **₹42,00,000**

BEP in units = Fixed Cost ÷ Contribution per unit
= ₹16,80,000 ÷ 120 (300 - 180) = **14,000 units**

(b) Margin of Safety:

MOS in value (₹) = Profit ÷ P/V Ratio
= ₹7,20,000 ÷ 40% = **₹18,00,000**

(c) Profit at 24,000 units:

Profit = Contribution – Fixed cost
= (24,000 × ₹120) – ₹16,80,000 = **₹12,00,000**

(d) Sales in value (₹) to earn a profit of ₹10,00,000:

Sales in value (₹) = (Fixed Cost + Profit) ÷ P/V Ratio
= (₹16,80,000 + ₹10,00,000) ÷ 40% = **₹67,00,000**

Working Note:

$$\textbf{P/V Ratio} = \frac{\text{Contribution}}{\text{Sale Price}} \times 100 = \frac{300 - 180}{300} \times 100 = \textbf{40\%}$$

PYQ 24

An agriculture based company having 210 hectares of land is engaged in growing three different cereals namely, wheat, rice, and maize annually. The yield of the different crops and their selling prices are given below:

Particulars	Wheat	Rice	Maize
Yield (in kgs per hectare)	2,000	500	100
Selling price (₹ per kg)	20	40	250

The variable cost data of different crops are given below:

(All figures in ₹ per kg)

Particulars	Wheat	Rice	Maize
Labour charges	8	10	120
Packing materials	2	2	10
Other variable expenses	4	1	20

The company has a policy to produce and sell all the three kinds of crops. The maximum and minimum area to be cultivated for each crop is as follows:

Particulars	Wheat	Rice	Maize
Maximum area in hectares	160	50	60
Minimum area in hectares	100	40	10

You are required to:

(a) Rank the crops on the basis of contribution per hectare.
(b) Determine the optimum product mix considering that all the three cereals are to be produced.
(c) Calculated the maximum profit which can be achieved if the total fixed cost per annum is ₹21,45,000. (Assume that there are no other constraints applicable to this company)

[(10 Marks) Nov 2022]

Answer

(a) Statement Showing Rank on the basis of Contribution per Hectare

Particulars	Wheat	Rice	Maize
Sale price per kg	20	40	250
Less: Labour charges per kg	(8)	(10)	(120)
Less: Packing materials per kg	(2)	(2)	(10)
Less: Other variable expenses per kg	(4)	(1)	(20)
Contribution per kg	6	27	100
× Yield in kg per hectare	× 2,000	× 500	× 100
Contribution per Hectare	12,000	13,500	10,000
Rank	***II***	***I***	***III***

(b) Statement Showing Optimum Product Mix

Cereals	Rank	Minimum Area	Additional Area	Total Area	Yield per Hectare	Production in kgs.
Wheat	II	100	50 (b.f.)	150	2,000	3,00,000
Rice	I	40	50 – 40 = 10	50	500	25,000
Maize	III	10	-	10	100	1,000
Total		***150***	***60***	***210***	***-***	***3,26,000***

(c) Maximum Profit = (3,00,000 kgs × ₹6) + (25,000 kgs × ₹27) + (1,000 kgs × ₹100) – ₹21,45,000
= ***₹4,30,000***

PYQ 25

The following information pertains to ZB Limited for the year:

Profit volume ratio	30%
Margin of Safety (as % of total sales)	25%
Fixed Cost	₹12,60,000

You are required to calculate:

(a) Break even sales value (₹),
(b) Total sales value (₹) at present,
(c) Proposed sales value (₹) if company wants to earn the present profit after reduction of 10% in fixed cost,
(d) Sales in value (₹) to be made to earn a profit of 20% on sales assuming fixed cost remains unchanged,
(e) New Margin of Safety if the sales value at present as computed in (b) decreased by 12.5%.

[(5 Marks) May 2023]

Answer

(a) Break even sales = $\frac{\text{Fixed cost}}{\text{PV Ratio}} = \frac{12,60,000}{30\%}$ = ***₹42,00,000***

(b) Total sales at present = $\frac{\text{BEP Sales}}{\text{BEP as \% of Total Sales}} = \frac{42,00,000}{75\%}$

= ***₹56,00,000***

(c) Proposed Sales = $\frac{\text{Revised Fixed cost} + \text{Desired Profit}}{\text{PV Ratio}}$

= $\frac{(12,60,000 - 10\%) + 4,20,000}{30\%}$ = ***₹51,80,000***

(d) Desired Sales Value = $\frac{\text{Fixed cost}}{\text{PV ratio} - \text{\% of Profit to Sales}} = \frac{12,60,000}{30\% - 20\%}$

= ***₹1,26,00,000***

(e) New Margin of Safety = Revised Sales – BEP Sales

= (56,00,000 – 12.5%) – 42,00,000 = ***₹7,00,000***

WN:

Existing Profit = MOS × PV Ratio = ₹56,00,000 × 25% × 30%

= ₹4,20,000

PYQ 26

MNP Company Limited produces two products 'A' and 'B'. The relevant cost and sales data per unit of output is as follows:

Particulars	***Product A (₹)***	***Product B (₹)***
Direct material	55	60
Direct labour	35	45
Variable factory overheads	40	20
Selling Price	180	175

The availability of machine hours is limited to 55,000 hours for the month. The monthly demand for product 'A' and product 'B' is 5,000 units and 6,000 units, respectively. The fixed expense of the company are ₹1,40,000 per month. Variable factory overheads are ₹4 per machine hour. The company can produce both products according to the market demand.

Calculate the product mix that generates maximum profit for the company in the given situation and also calculate profit of the company.

[(5 Marks) May 2023]

Answer

Statement Showing Best Possible Mix and Profit of MNP Company Ltd.

Rank	Product	Units/Mix	Machine hours	Contribution
I	Product B	6,000	30,000	3,00,000
II	Product A (25,000 hours ÷ 10)	2,500	25,000 (b.f.)	1,25,000
Total		8,500	55,000	
Total Contribution				4,25,000
Less: Fixed Expenses				(1,40,000)
Profit				***2,85,000***

Working notes:

Calculation of Contribution per machine hour and Rank:

Particulars	A	B
Sale price per unit	180	175
Less: Direct materials per unit	55	60
Less: Direct labour per unit	35	45
Less: Variable overheads per unit	40	20
Contribution per unit	50	50
÷ Machine hours per unit (40 ÷ 4) and (20 ÷ 4)	÷ 10	÷ 5
Contribution per machine hour	5	10
Rank	***II***	***I***

SUGGESTED REVISION FOR EXAM:

BQ: 7, 11, 13, 14, 16, 18, 19, 20, 23, 24, 28, 29, 31, 33, 36, 37, 39

PYQ: 1, 3, 5, 6, 16, 24

CHAPTER 14 COST ACCOUNTING SYSTEM

INTEGRATED ACCOUNTING SYSTEM

BQ 1

In the absence of the chief Accountants you have been asked to prepare a month's cost accounts for a company which operates a batch costing system fully integrated with the financial accounts. The following relevant information is provided to you:

Balances at the beginning of the month:

Stores ledger control Account	25,000
Work in progress control account	20,000
Finished goods control account	35,000
Prepaid production overheads brought forward from previous month	3,000

Transactions during the month:

Materials purchased		75,000
Materials Issued:		
To Production	30,000	
To factory Maintenance	4,000	34,000
Materials transferred between batches		5,000
Total wages paid:		
To direct workers	25,000	
To Indirect workers	5,000	30,000
Direct wages charged to batches		20,000
Recorded non-productive time of direct workers		5,000
Selling and distribution overheads incurred		6,000
Other production overheads incurred		12,000
Sales		1,00,000
Cost of finished goods sold		80,000
Cost of goods completed and transferred into Finished goods during the month		65,000
Physical value of work in progress at the end of month		40,000

The production overhead absorption rate is 150% of direct wages charged to work in progress.

Prepare the following accounts for the month:

(a) Stores ledger control account.
(b) Work in progress control account.
(c) Finished goods control account.
(d) Production overheads control account.
(e) Profit and loss account.

[(a) ₹66,000 (b) ₹40,000 (c) ₹20,000 (d) Over absorption taken to P/L A/c ₹1,000 (e) ₹20,000]

BQ 2

The following incomplete accounts are furnished to you for the month ended 31st October, 2023:

Creditors for Purchases Account

		01.10.23 By Balance	30,000

Stores Control Account

01.10.23 To Balance	54,000		

Factory overheads Control Account

Total debits for October, 2023	45,000		

Work in progress control Account

01.10.23 To Balance	6,000		

Finished Goods Control Account

01.10.23 To Balance	75,000		

Additional information:

(i) The factory overheads are applied by using a budgeted rate based on direct labour hours. The budget for overheads for 2023 is ₹6,75,000 and the budget of direct labour hours is 4,50,000.
(ii) The balance in the account of creditors for purchases on 31.10.23 is ₹15,000 and the payments made to creditors in October, 2023 amount to ₹1,05,000.
(iii) The finished goods inventory as on 31st October, 2023 is ₹66,000.
(iv) The cost of goods sold during the month was ₹1,95,000.
(v) On 31st October, 2023 there was only one unfinished job in the factory. The cost records show that ₹3,000 (1,200 direct labour hours) of direct labour cost and ₹6,000 of direct material cost had been charged.
(vi) A total of 28,200 direct labour hours were worked in October, 2023. All factory workers earn same rate of pay.
(vii) All actual factory overheads incurred in October, 2023 have been posted.

You are required to find:

(a) Materials purchased during October, 2023.
(b) Cost of goods completed in October, 2023.
(c) Overheads applied to production in October, 2023.
(d) Balance of work in progress on 31st October, 2023.
(e) Direct materials consumed during October, 2023.
(f) Balance of Stores Control account on 31st October, 2023.
(g) Over absorbed or under absorbed overheads for October, 2023.

[(a) 90,000 (b) 1,86,000 (c) 42,300 (d) 10,800 (e) 78,000 (f) 66,000 (g) 2,700 under-recovered]

BQ 3

A fire destroyed some accounting records of a company. You have been able to collect the following from the spoilt papers/records and as a result of consultation with accounting staff in respect of January, 2017.

Incomplete Ledger Entries:

Materials Control A/c

Particulars	*₹*	*Particulars*	*₹*
To Balance b/d	32,000		

Work-in-Progress Control A/c

Particulars	*₹*	*Particulars*	*₹*
To Balance b/d	9,200	By Finished Goods Control A/c	1,51,000

Payable (Creditors) A/c

Particulars	₹	Particulars	₹
To Balance c/d	19,200	By Balance b/d	16,400

Manufacturing Overheads Control A/c

Particulars	₹	Particulars	₹
To Bank A/c (Amount Spent)	29,600		

Finished Goods Control A/c

Particulars	₹	Particulars	₹
To Balance b/d	24,000	By Balance c/d	30,000

Additional Information:

1. The cash-book showed that ₹89,200 have been paid to creditors for raw-material.
2. Ending inventory of work-in-progress included material ₹5,000 on which 300 direct labour hours have been booked against wages and overheads.
3. The job card showed that workers have worked for 7,000 hours. The wage rate is ₹10 per labour hour.
4. Overhead recovery rate was ₹4 per direct labour hour.

You are required to complete the above accounts in the cost ledger of the company.

Answer

Materials Control A/c

Particulars	₹	Particulars	₹
To Balance b/d	32,000	By WIP Ledger Control A/c	53,000
To Payables/Creditors A/c (WN) (Purchases)	92,000	(figure from WIP A/c)	
		By Balance b/d	71,000
	1,24,000		*1,24,000*

WIP Ledger Control A/c

Particulars	₹	Particulars	₹
To Balance b/d	9,200	By Finished Goods Control A/c	1,51,000
To Materials Control A/c (b.f.)	53,000	By Balance c/d:	
To Wages Control A/c (7,000 hrs × ₹10)	70,000	Material ₹5,000	
To Manufacturing OH Control A/c	28,000	Labour (300 hrs × ₹10) ₹3,000	9,200
	1,60,200	Overheads (300 hrs × ₹4) ₹1,200	*1,60,200*

Manufacturing Overheads Control A/c

Particulars	₹	Particulars	₹
To Bank A/c	29,600	By WIP Ledger Control A/c (7,000 hrs × ₹4)	28,000
		By Costing P/L A/c (Under-absorbed Overheads)	1,600
	29,600		*29,600*

Finished Goods Control A/c

Particulars	₹	Particulars	₹
To Balance b/d	24,000	By Cost of Sales A/c (b.f.)	1,45,000
To Work-in-progress Control A/c	1,51,000	By Balance c/d	30,000
	1,75,000		1,75,000

Working note:

Payables (Creditors) A/c

Particulars	₹	Particulars	₹
To Cash or Bank A/c	89,200	By Balance b/d	16,400
To Balance c/d	19,200	By Material Control A/c (Purchase/Balancing figure)	92,000
	1,08,400		1,08,400

BQ 4

Journalise the following transactions assuming that cost and financial transactions are integrated:

Details of Transactions	(₹)
Raw materials purchased	2,00,000
Direct materials issued to production	1,50,000
Wages paid (30% indirect)	1,20,000
Wages charged to production	84,000
Manufacturing expenses incurred	84,000
Manufacturing overhead charged to production	92,000
Selling and distribution costs	20,000
Finished products (at cost)	2,00,000
Sales	2,90,000
Closing stock	Nil
Receipts from debtors	69,000
Payments to creditors	1,10,000

Answer

Journal Entries

Entries		Dr.	Cr.
Stores Ledger Control A/c	Dr.	2,00,000	
To Payables (Creditors)/Bank A/c			2,00,000
(Being materials purchased)			
Work-in-progress Ledger Control A/c	Dr.	1,50,000	
To Stores Ledger Control A/c			1,50,000
(Being direct materials issued to production)			
Wages Control A/c	Dr.	1,20,000	
To Bank A/c			1,20,000
(Being wages paid)			
Work-in-progress Ledger Control A/c	Dr.	84,000	
Factory Overhead Control A/c	Dr.	36,000	
To Wages Control A/c			1,20,000
(Being allocation of direct and indirect wages)			
Factory Overhead Control A/c	Dr.	84,000	
To Bank A/c			84,000
(Being manufacturing overheads incurred)			
Work-in-progress Ledger Control A/c	Dr.	92,000	
To Factory Overhead Control A/c			92,000

(Being manufacturing overheads charged to production)			
Selling and Distribution Overhead Control A/c	Dr.	20,000	
To Bank A/c			20,000
(Being selling and distribution cost incurred)			
Finished Goods Control A/c	Dr.	2,00,000	
To Work-in-progress Ledger Control A/c			2,00,000
(Being cost of finished goods transferred to finished goods account)			
Cost of Sales A/c	Dr.	2,20,000	
To Finished Goods Control A/c			2,00,000
To Selling and Distribution Overhead Control A/c			20,000
(Being cost of goods sold)			
Receivables/Debtors/Bank A/c	Dr.	2,90,000	
To Sales A/c			2,90,000
(Being finished stock sold)			
Bank A/c	Dr.	69,000	
To Receivables/Debtors A/c			69,000
(Being collection received from debtors)			
Payables/Creditors A/c	Dr.	1,10,000	
To Bank A/c			1,10,000
(Being payments made to creditors)			

BQ 5

Dutta Enterprises operates an integral system of accounting. You are required to pass the Journal Entries for the following transactions that took place for the year ended 30th June, 2023.

Details of Transactions	(₹)
Raw materials purchased (50% on credit)	6,00,000
Materials issued to production	4,00,000
Wages paid (50% indirect)	2,00,000
Wages charged to production	1,00,000
Factory overheads incurred	80,000
Factory overheads charged to production	1,00,000
Selling and distribution overheads incurred	40,000
Finished goods at cost	5,00,000
Sales (50% on credit)	7,50,000
Closing stock	Nil
Receipts from debtors	2,00,000
Payments to creditors	2,00,000

(Narrations are not required.)

Answer

Journal Entries

Entries		Dr.	Cr.
Stores Ledger Control A/c	Dr.	6,00,000	
To Payables/Creditors A/c			3,00,000
To Bank A/c			3,00,000
Work-in-progress Ledger Control A/c	Dr.	4,00,000	
To Stores Ledger Control A/c			4,00,000
Wages Control A/c	Dr.	2,00,000	
To Bank A/c			2,00,000
Work-in-progress Ledger Control A/c	Dr.	1,00,000	
To Wages Control A/c			1,00,000
Factory Overhead Control A/c	Dr.	1,00,000	

To Wages Control A/c			1,00,000
Factory Overhead Control A/c	Dr.	80,000	
To Bank A/c			80,000
Work-in-progress Ledger Control A/c	Dr.	1,00,000	
To Factory Overhead Control A/c			1,00,000
Selling and Distribution Overhead Control A/c	Dr.	40,000	
To Bank A/c			40,000
Finished Goods Control A/c	Dr.	5,00,000	
To Work-in-progress Ledger Control A/c			5,00,000
Cost of Sales A/c	Dr.	5,40,000	
To Finished Goods Control A/c			5,00,000
To Selling and Distribution Overhead Control A/c			40,000
Receivables/Debtors A/c	Dr.	3,75,000	
Bank A/c	Dr.	3,75,000	
To Sales A/c			7,50,000
Bank A/c	Dr.	2,00,000	
To Receivables/Debtors A/c			2,00,000
Payables/Creditors A/c	Dr.	2,00,000	
To Bank A/c			2,00,000

NON INTEGRATED ACCOUNTING SYSTEM

BQ 6

As on 31st March, 2023, the following balance existed in a firm's cost Ledger:

Name of Account	Dr.	Cr.
Stores Ledger Control A/c	3,01,435	-
Work in progress Control A/c	1,22,365	-
Finished Stock Ledger Control A/c	2,51,945	-
Manufacturing Overhead Control A/c	-	10,525
Cost Ledger Control A/c	-	6,65,220
Total	**6,75,745**	**6,75,745**

During the next three months the following items arose:

Finished product (at cost)	2,10,835
Manufacturing overhead incurred	91,510
Raw materials purchased	1,23,000
Factory Wages	50,530
Indirect Labour	21,665
Cost of sales	1,85,890
Material issued to production	1,27,315
Sales returned at Cost	5,380
Material returned to suppliers	2,900
Manufacturing overhead charged to production	77,200

You are required to pass the Journal Entries; write up the accounts and schedule the balances, stating what each balance represents.

[SLC 2,94,220; WIP 1,66,575; Finished Stock 2,82,270; Manufacturing OH 25,450; COS 1,80,510; CLC 9,49,025]

BQ 7

Acme Manufacturing Co. Ltd. opens the costing records, with the balances as on 1st July as follows:

Name of Account	Dr.	Cr.
Material Control A/c	1,24,000	-
Work-in-process	62,500	-
Finished Goods A/c	1,24,000	-
Production Overheads A/c	8,400	-
Administration Overhead	-	12,000
Selling and Distribution Overhead A/c	6,250	-
Cost Ledger Control A/c	-	3,13,150
Total	***3,25,150***	***3,25,150***

The following are the transactions for the quarter ended 30th September:

Particulars	₹
Materials purchased	4,80,100
Materials issued to jobs	4,77,400
Materials to works maintenance	41,200
Materials to administration office	3,400
Materials to sales department	7,200
Wages direct	1,49,300
Wages indirect	65,000
Transportation for indirect materials	8,400
Production overheads	2,42,250
Absorbed production overheads	3,59,100
Administration overheads incurred	74,000
Administration allocation to production	52,900
Administration allocation to sales department	14,800
Selling & Distribution overheads incurred	64,200
Selling & Distribution overheads absorbed	82,000
Finished goods produced	9,58,400
Finished goods sold	9,77,300
Sales	14,43,000

Make up the various accounts as you envisage in the Cost Ledger and prepare a Trial Balances as at 30th September.

Answer

Material Control A/c

Particulars	₹	Particulars	₹
To Balance b/d	1,24,000	By Work-in-process control A/c	4,77,400
To Cost ledger control A/c (Purchases)	4,80,100	By Production OH control A/c	41,200
		By Administration OH control A/c	3,400
		By S & D OH control A/c	7,200
		By Balance c/d	74,900
	6,04,100		***6,04,100***

Wages Control A/c

Particulars	₹	Particulars	₹
To Cost ledger control A/c (₹1,49,300 + ₹65,000)	2,14,300	By Work-in-process control A/c	1,49,300
		By Production OH control A/c	65,000
	2,14,300		***2,14,300***

Production Overhead Control A/c

Particulars	₹	Particulars	₹

To Balance b/d	8,400	By Work-in-process control A/c	3,59,100
To Cost Ledger control A/c:		By Balance c/d	6,150
Transportation			
8,400	2,50,650		
Production overheads	65,000		
2,42,250	41,200		
To Wages control A/c	***3,65,250***		***3,65,250***
To Material control A/c			

Work-in-Progress Control A/c

Particulars	***₹***	***Particulars***	***₹***
To Balance b/d	62,500	By Finished goods control A/c	9,58,400
To Material control A/c	4,77,400	By Balance c/d	89,900
To Wages control A/c	1,49,300		
To Production OH control A/c	3,59,100		
	10,48,300		***10,48,300***

Administration Overhead Control A/c

Particulars	***₹***	***Particulars***	***₹***
To Cost Ledger control A/c	74,000	By Balance b/d	12,000
To Material control A/c	3,400	By Finished goods control A/c	52,900
To Balance c/d	2,300	By Cost of sales A/c	14,800
	79,700		***79,700***

Finished Goods Control A/c

Particulars	***₹***	***Particulars***	***₹***
To Balance c/d	1,24,000	By Cost of sales A/c	9,77,300
To Work-in-process A/c	9,58,400	By Balance c/d	1,58,000
To Administration OH control A/c	52,900		
	11,35,300		***11,35,300***

Selling and Distribution Overhead Control A/c

Particulars	***₹***	***Particulars***	***₹***
To Balance b/d	6,250	By Cost of Sales A/c	82,000
To Cost Ledger control A/c	64,200		
To Material control A/c	7,200		
To Balance c/d	4,350		
	82,000		***82,000***

Cost of Sales A/c

Particulars	***₹***	***Particulars***	***₹***
To Finished Goods Control A/C	9,77,300	By Costing profit & loss A/c	10,74,100
To Administration OH control A/c	14,800		
To S & D OH control A/c	82,000		
	10,74,100		***10,74,100***

Costing Profit & Loss A/c

Particulars	***₹***	***Particulars***	***₹***
To Cost of sales A/c	10,74,100	By Cost ledger control A/c	14,43,000
To Cost ledger control A/c (b.f.)	3,68,900	(Sales)	
(Profit for the period)			
	14,43,000		***14,43,000***

Cost Ledger Control A/c

Particulars	₹	Particulars	₹
To Costing profit and loss A/c	14,43,000	By Balance b/d	3,13,150
To Balance c/d	3,22,300	By Material control A/c	4,80,100
		By Wages Control A/c	2,14,300
		By Production OH control A/c	2,50,650
		By Administration OH control A/c	74,000
		By S & D OH control A/c	64,200
		By Costing profit and loss A/c	3,68,900
	17,65,300		**17,65,300**

Trial Balance as at 30th September

Name of Account	Dr.	Cr.
Material Control A/c	74,900	-
Work-in-process Control A/c	89,900	-
Finished Goods Control A/c	1,58,000	-
Production Overheads Control A/c	6,150	-
Administration Overhead Control A/c	-	2,300
Selling and Distribution Overhead Control A/c	-	4,350
Cost Ledger Control A/c	-	3,22,300
Total	**3,28,950**	**3,28,950**

BQ 8

The following figures have been extracted from the Cost Ledger of a manufacturing unit:

Stores:

Opening balance	15,000
Purchases	80,000
Transfer from work-in-progress	40,000
Issues to work-in-progress	80,000
Issues to repairs and maintenance	10,000
Sold as special case at cost	5,000
Shortage in the year	3,000

Work-in-progress:

Opening inventory	30,000
Direct labour cost charged	30,000
Overhead cost charged	1,20,000
Closing balance	20,000

Entire output is sold at a profit of 10% on actual cost from work-in-progress.

Wages for the period	35,000
Overhead expenses	1,25,000

Ascertain the profit or loss as per financial account and cost accounts and reconcile them.

Answer

Stores Ledger Control Account

Particulars	Amount	Particulars	Amount
To Balance b/d	15,000	By WIP Control A/c	80,000
To Cost Ledger Control A/c	80,000	By Cost Ledger Control A/c	5,000
(Purchases)	40,000	(Materials sold at cost)	
To Work in progress Control A/c		By Overhead Control A/c	10,000

(Return from WIP)		By Overhead Control A/c (assumed normal)	3,000
		By Balance c/d	37,000
	1,35,000		***1,35,000***

Wages Control Account

Particulars	*Amount*	*Particulars*	*Amount*
To Cost Ledger Control A/c	35,000	By WIP Control A/c	30,000
		By Overhead Control A/c	5,000
	35,000		***35,000***

Overhead Control Account

Particulars	*Amount*	*Particulars*	*Amount*
To Cost Ledger Control A/c	1,25,000	By WIP Control A/c	1,20,000
To Store Ledger Control A/c	10,000	By Balance c/d	23,000
To Store Ledger Control A/c	3,000	(under recovery carried forward)	
To Wages Control A/c	5,000		
	1,43,000		***1,43,000***

Work in Progress Control Account

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	30,000	By Stores Control A/c	40,000
To Stores Ledger Control A/c	80,000	By Costing Profit and Loss A/c	2,00,000
To Wages Control A/c	30,000	(i.e., cost of sales)	
To Overhead Control A/c	1,20,000	By Balance c/d	20,000
	2,60,000		***2,60,000***

Costing Profit & Loss Account

Particulars	*Amount*	*Particulars*	*Amount*
To WIP Control A/c	2,00,000	By Cost Ledger Control A/c	2,20,000
To Profit	20,000	(Sales: 2,00,000 + 10%)	
	2,20,000		***2,20,000***

(Alternatively) Statement of Profit as per Costing Records

Particulars	*Amount*
Direct materials cost (80,000 – 40,000)	40,000
Direct wages	30,000
Prime Cost	70,000
Production overheads	1,20,000
Add: Opening WIP	30,000
Less: Closing WIP	(20,000)
Cost of Finished Goods	2,00,000
Profit @10% of 2,00,000	20,000
Sales	2,20,000

Profit & Loss Account

Particulars		*Amount*	*Particulars*		*Amount*
To Opening stock:			By Sales		2,20,000
Materials	15,000		By Closing stock:		
WIP	30,000	45,000	Materials	37,000	
To Purchases net of item sold		75,000	WIP	20,000	57,000

(80,000 – 5,000)		By Net Loss	3,000
To Wages incurred	35,000		
To Overheads incurred	1,25,000		
	2,80,000		***2,80,000***

Reconciliation statement

Particulars	***₹***
Profit as per Cost Accounts	20,000
Less: Overhead under recovered	(23,000)
Loss as per Financial Accounts	(3,000)

BQ 9

A company operates on historic job cost accounting system, which is not integrated with the financial accounts. At the beginning of a month, the opening balances in cost ledger were:

Particulars	***₹(In lakhs)***
Stores Ledger Control Account	80
Work-in-Process Control Account	20
Finished Goods Control Account	430
Building Construction Account	10
Cost Ledger Control Account	540
During the month, the following transaction took place:	
Materials:	
Purchased	40
Issued to production	50
Issued to factory maintenance	6
Issued to building construction	4
Wages:	
Gross wages paid	150
Indirect wages	40
For building construction	10
Works Overheads:	
Actual amount incurred (excluding items shown above)	160
Absorbed in building construction	20
Under absorbed	8
Royalty paid (related to production)	5
Selling, distribution and administration overheads	25
Sales	450

At the end of the month, the stock of raw material and work-in-Process was ₹55 lakhs and ₹25 lakhs respectively. The loss arising in the raw material accounts is treated as factory overheads. The building under construction was completed during the month. Company's gross profit margin is 20% on sales.

Prepare the relevant control accounts to record the above transactions in the cost ledger of the company.

Answer

Stores Ledger Control A/c

Particulars	***₹(in lakhs)***	***Particulars***	***₹(in lakhs)***

To Balance b/d	80	By Work-in-process A/c	50
To Cost Ledger Control A/c	40	By Works OH Control A/c	6
		By Building Construction A/c	4
		By Works OH Control A/c (b.f.; loss)	5
		By Balance c/d	55
	120		***120***

Wages Control A/c

Particulars	***₹(in lakhs)***	***Particulars***	***₹(in lakhs)***
To Cost Ledger Control A/c	150	By Work-in-process A/c (b.f.)	100
		By Works OH Control A/c	40
		By Building Construction A/c	10
	150		***150***

Royalty A/c

Particulars	***₹(in lakhs)***	***Particulars***	***₹(in lakhs)***
To Cost Ledger Control A/c	5	By Work-in-process A/c	5
	5		***5***

Works Overhead Control A/c

Particulars	***₹(in lakhs)***	***Particulars***	***₹(in lakhs)***
To Cost Ledger Control A/c	160	By Work-in-process A/c (b.f.)	183
To Stores Ledger Control A/c	6	By Building Construction A/c	20
To Stores Ledger Control A/c	5	By Costing P & L A/c	8
To Wages Control A/c	40	(under absorption)	
	211		***211***

Work-in-Process Control A/c

Particulars	***₹(in lakhs)***	***Particulars***	***₹(in lakhs)***
To Balance b/d	20	By Finished Goods Control A/c (b.f.)	333
To Works OH Control A/c	183	By Balance c/d	25
To Wages Control A/c	100		
To Stores Ledger Control A/c	50		
To Royalty A/c	5		
	358		***358***

Finished Goods Control A/c

Particulars	***₹(in lakhs)***	***Particulars***	***₹(in lakhs)***
To Balance b/d	430	By Cost of Sales A/c	360
To Work-in-Progress Control A/c	333	(80% of ₹450/Gross Profit 20%)	
		By Balance c/d (b.f)	403
	763		***763***

Selling, Distribution and Administration Overhead A/c

Particulars	***₹(in lakhs)***	***Particulars***	***₹(in lakhs)***
To Cost Ledger Control A/c	25	By Cost of Sales A/c	25
	25		***25***

Cost of Sales A/c

Particulars	***₹(in lakhs)***	***Particulars***	***₹(in lakhs)***
To Finished Goods Control A/c	360	By Costing P & L A/c	385

To Selling, Distribution and Administration OH A/c	25		
	385		***385***

Costing P & L A/c

Particulars	*₹(in lakhs)*	*Particulars*	*₹(in lakhs)*
To Cost of Sales A/c	385	By Cost Ledger Control A/c (Sales)	450
To Works OH Control A/c	8		
To Cost Ledger Control A/c	57		
(Profit/b.f.)	***450***		***450***

Building Construction A/c

Particulars	*₹(in lakhs)*	*Particulars*	*₹(in lakhs)*
To Balance b/d	10	By Cost Ledger Control A/c	44
To Stores Ledger Control A/c	4		
To Wages Control A/c	10		
To Works OH Control A/c	20		
	44		***44***

Cost Ledger Control A/c

Particulars	*₹(in lakhs)*	*Particulars*	*₹(in lakhs)*
To Costing P & L A/c	450	By Balance b/d	540
To Building Construction A/c	44	By Stores Ledger Control A/c	40
To Balance c/d	483	By Wages Control A/c	150
		By Works OH Control A/c	160
		By Royalty A/c	5
		By Selling, Distribution and Administration OH A/c	25
		By Costing P & L A/c	57
	977		***977***

Trial Balance

Name of Account	*Dr.*	*Cr.*
Stores Ledger Control A/c	55	-
Work in progress Control A/c	25	-
Finished Goods Control A/c	403	-
Cost Ledger Control A/c	-	483
Total	***483***	***483***

PAST YEAR QUESTIONS

PYQ 1

The following information has been extracted from the cost records of a manufacturing company:

Stores:

Opening balance	9,000
Purchase	48,000
Transfer from WIP	24,000
Issue to work-in-process	48,000
Issue for repairs	6,000
Deficiency found in stock	1,800

Work-in-process:

Opening balance	18,000
Direct wages applied	18,000
Overhead charged	72,000
Closing balance	12,000

Finished Production: Entire production is sold at a profit of 10% on cost from Work-in-process.

Wages paid	21,000
Overhead incurred	75,000

Draw the Stores Ledger Control A/c, Work-in-progress Control A/c, Overheads Control A/c and Costing Profit and Loss A/c.

[(8 marks) Nov 2011/May 2017]

Answer

Stores Ledger Control A/c

Particulars	Amount	Particulars	Amount
To Balance b/d	9,000	By WIP Ledger Control A/c	48,000
To Cost Ledger Control A/c	48,000	By Overhead Control A/c	6,000
To WIP Ledger Control A/c	24,000	By Overhead Control A/c (Deficiency assumed normal)	1,800
		By Balance c/d	25,200
	81,000		***81,000***

WIP Ledger Control A/c

Particulars	Amount	Particulars	Amount
To Opening balance	18,000	By Stores Ledger Control A/c	24,000
To Stores Ledger Control A/c	48,000	By Costing Profit & Loss A/c	1,20,000
To Wages Control A/c	18,000	By Balance c/d	12,000
To Overhead Control A/c	72,000		
	1,56,000		***1,56,000***

Overhead Control A/c

Particulars	Amount	Particulars	Amount
To Cost Ledger Control A/c	75,000	By WIP Ledger Control A/c	72,000
To Stores Ledger Control A/c	6,000	By Costing P & L A/c	13,800
To Stores Ledger Control A/c	1,800		

To Wages Control A/c	3,000		
	85,800		**85,800**

Costing P/L A/c

Particulars	Amount	Particulars	Amount
To WIP Ledger Control A/c	1,20,000	By Cost Ledger Control A/c	1,32,000
To Overhead Control A/c	13,800	(1,20,000 + 10%)	
		By Cost Ledger Control A/c	1,800
		(Loss)	
	1,33,800		**1,33,800**

Wages Control A/c

Particulars	Amount	Particulars	Amount
To Cost Ledger Control A/c	21,000	By WIP Ledger Control A/c	18,000
		By Overhead Control A/c	3,000
	21,000		**21,000**

Note: This question is solved on the basis of Non Integrated Method of accounting, alternatively student can solve this problem by using Integrated Method of accounting.

PYQ 2

Following information has been extracted from the cost records of XYZ Pvt. Ltd:

Stores:

Opening balance	54,000
Purchase	2,88,000
Transfer from WIP	1,44,000
Issue to work-in-process	2,88,000
Issue for repairs	36,000
Deficiency found in stock	10,800

Work-in-process:

Opening balance	1,08,000
Direct wages applied	1,08,000
Overhead charged	4,32,000
Closing balance	72,000

Finished Production:

Entire production is sold at a profit of 15% on cost from Work-in-process.

Wages paid	1,26,000
Overhead incurred	4,50,000

Draw the Stores Ledger Control A/c, Work-in-progress Control A/c, Overheads Control A/c and Costing Profit and Loss A/c.

[(8 marks) Nov 2014]

Answer

Stores Ledger Control A/c

Particulars	Amount	Particulars	Amount

To Balance b/d	54,000	By WIP Ledger Control A/c	2,88,000
To Cost Ledger Control A/c	2,88,000	By Overhead Control A/c	36,000
To WIP Ledger Control A/c	1,44,000	By Overhead Control A/c	10,800
		(Deficiency assumed normal)	1,51,200
		By Balance c/d	
	4,86,000		***4,86,000***

WIP Ledger Control A/c

Particulars	***Amount***	***Particulars***	***Amount***
To Opening balance	1,08,000	By Stores Ledger Control A/c	1,44,000
To Stores Ledger Control A/c	2,88,000	By Costing Profit & Loss A/c	7,20,000
To Wages Control A/c	1,08,000	By Balance c/d	72,000
To Overhead Control A/c	4,32,000		
	9,36,000		***9,36,000***

Overhead Control A/c

Particulars	***Amount***	***Particulars***	***Amount***
To Cost Ledger Control A/c	4,50,000	By WIP Ledger Control A/c	4,32,000
To Stores Ledger Control A/c	36,000	By Costing P & L A/c	82,800
To Stores Ledger Control A/c	10,800		
To Wages Control A/c	18,000		
	5,14,800		***5,14,800***

Costing P/L A/c

Particulars	***Amount***	***Particulars***	***Amount***
To WIP Ledger Control A/c	7,20,000	By Cost Ledger Control A/c	8,28,000
To Overhead Control A/c	82,800	(Sales: 7,20,000 + 15%)	
To Cost Ledger Control A/c	25,200		
(Profit)			
	8,28,000		***8,28,000***

Wages Control A/c

Particulars	***Amount***	***Particulars***	***Amount***
To Cost Ledger Control A/c	1,26,000	By WIP Ledger Control A/c	1,08,000
		By Overhead Control A/c	18,000
	1,26,000		***1,26,000***

PYQ 3

The following information is available from a company's records for March, 2016:

(a)	Opening balance of Creditors Account	₹25,000
(b)	Closing balance of Creditors Account	₹40,000
(c)	Payment made to Creditors	₹5,80,000
(d)	Opening balance of Stores Ledger Control Account	₹40,000
(e)	Closing balance of Stores Ledger Control Account	₹65,000
(f)	Wages paid (for 8,000 hours) 20% relate to indirect workers	₹4,00,000
(g)	Various indirect expenses incurred	₹60,000
(h)	Opening balance of WIP Control Account	₹50,000
(i)	Inventory of WIP at the end includes:	
	Material worth	₹35,000
	Labour hours booked	400 hours

(j) Budgeted:

Overhead cost	₹20,80,000
Labour hours	1,04,000

(a) Factory overhead is charged to production at budgeted rate based on direct labour hours.

You are required to prepare Creditors A/c, Stores Ledger Control A/c, WIP Control A/c, Wages Control A/c and Factory Overhead Control A/c.

[(8 marks) May 2016]

Answer

Creditors A/c

Particulars	*₹*	*Particulars*	*₹*
To Cash or Bank A/c	5,80,000	By Balance b/d	25,000
To Balance c/d	40,000	By Stores Ledger Control A/c (Balancing figure)	5,95,000
	6,20,000		***6,20,000***

Stores Ledger Control A/c

Particulars	*₹*	*Particulars*	*₹*
To Balance b/d	40,000	By Work-in-progress Control A/c	5,70,000
To Creditors A/c (Purchase: figure from creditor A/c)	5,95,000	(Balancing figure) By Balance b/d	65,000
	6,35,000		***6,35,000***

Work-in-progress Ledger Control A/c

Particulars	*₹*	*Particulars*	*₹*
To Balance b/d	50,000	By Finished Goods Control A/c (b.f.)	10,05,000
To Stores Ledger Control A/c	5,70,000	By Balance c/d:	
To Wages Control A/c	3,20,000	Material ₹35,000	
To Factory Overhead Control A/c	1,28,000	Labour (400 hrs × ₹50) ₹20,000	63,000
	10,68,000	Overheads (400 hrs × ₹20) ₹8,000	***10,68,000***

Wages Control A/c

Particulars	*₹*	*Particulars*	*₹*
To Bank A/c	4,00,000	By WIP Ledger Control A/c (8,000 hours × 80% × 50)	3,20,000
		By Factory Overhead Control A/c (8,000 hours × 20% × 50)	80,000
	4,00,000		***4,00,000***

Factory Overhead Control A/c

Particulars	*₹*	*Particulars*	*₹*
To Bank A/c	60,000	By WIP Ledger Control A/c (6,400 hrs × ₹20)	1,28,000
To Wages Control A/c	80,000	By Costing P/L A/c (Under-absorbed Overheads)	12,000
	1,40,000		***1,40,000***

Working notes:

1. Direct Labour Hour Rate = Labour Cost ÷ Labour Hour
= ₹4,00,000 ÷ 8,000 hours = ***₹50 per hour***

2. Factory Overhead Rate = Budgeted Factory Overheads ÷ Budgeted Labour Hours
= ₹20,80,000 ÷ 1,04,000 = ***₹20 per hour***

PYQ 4

The following balances were extracted from a company's ledger as on 30th June 2018:

Name of Account	*Dr.*	*Cr.*
Raw materials control A/c	2,82,450	-
Work in progress control A/c	2,38,300	-
Finished stock control A/c	3,92,500	-
General ledger adjustment A/c	-	9,13,250
Total	*9,13,250*	*9,13,250*

The following transactions took place during the quarter ended 30th September, 2018:

Factory overhead - allocated to WIP	1,36,350
Goods Finished at - cost	13,76,200
Raw materials purchased	12,43,810
Direct wages - allocated to WIP	2,56,800
Cost of goods sold	14,56,500
Raw materials - issued to production	13,60,430
Raw materials - credited by suppliers	27,200
Raw material losses – inventory audit	6,000
WIP rejected (with no scrap value)	12,300
Customer's return (at cost) of finished goods	45,900

You are required to prepare:

(1) Raw material control A/c
(2) Work-in-progress control A/c
(3) Finished stock control A/c
(4) General ledger adjustment A/c

[(10 Marks) Nov 2018]

Answer

Raw Material Control A/c

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	2,82,450	By WIP A/c	13,60,430
To General Ledger Adjustment A/c	12,43,810	By General Ledger Adjustment A/c	27,200
		By General Ledger Adjustment A/c (Loss)	6,000
		By Balance c/d (Bal. figure)	1,32,630
	15,26,260		*15,26,260*

Work-in-Process Control A/c

Particulars	*Amount*	*Particulars*	*Amount*
To Balance b/d	2,38,300	By Finished Stock Control A/c	13,76,200
To Raw Material Control A/c	13,60,430	By General Ledger Adjustment A/c	12,300
To Wages Control A/c	2,56,800	(Rejected)	
To Factory OH Control A/c	1,36,350	By Balance c/d (Bal. figure)	6,03,380
	19,91,880		*19,91,880*

Finished Stock Control A/c

Particulars	Amount	Particulars	Amount
To Balance b/d	3,92,500	By Cost of Sales	14,56,500
To Work-in-Progress Control A/c	13,76,200	By Balance c/d (bal. figure)	3,58,100
To Cost of Sales (Return)	45,900		
	18,14,600		**18,14,600**

General Ledger Adjustment A/c

Particulars	Amount	Particulars	Amount
To Raw Material Control A/c (Returns)	27,200	By Balance b/d	9,13,250
		By Raw Material Control A/c	12,43,810
To Raw Materials Control A/c (Loss)	6,000	By Wages Control A/c	2,56,800
To WIP Control A/c (Rejected)	12,300	By Factory OH Control A/c	1,36,350
To Balance c/d	25,04,710		
	25,50,210		**25,50,210**

PYQ 5

Journalise the following transactions in the cost books under non- integrated system of accounting:

(a)	Credit Purchase of Material	₹27,000
(b)	Manufacturing overheads charged to production	₹6,000
(c)	Selling and Distribution overheads recovered from Sales	₹4,000
(d)	Indirect wages incurred	₹8,000
(e)	Material returned from production to stores	₹9,000

[(5 Marks) Nov 2019]

Answer

Journal Entries

S. No.	Entries		Dr.	Cr.
(a)	Store Ledger Control A/c	Dr.	27,000	-
	To Cost Ledger Control A/c		-	27,000
(b)	Work-in-progress Ledger Control A/c	Dr.	6,000	-
	To Manufacturing Overhead Control A/c		-	6,000
(c)	Cost of Sales A/c	Dr.	4,000	-
	To Selling & Distribution Overhead Control A/c		-	4,000
(d)	Wages Control A/c	Dr.	8,000	-
	To Cost Ledger Control A/c		-	8,000
(e)	Store Ledger Control A/c	Dr.	9,000	-
	To Work-in-progress Ledger Control A/c		-	9,000

PYQ 6

Journalize the following transactions assuming the cost and financial accounts are integrated:

Particulars	(in ₹)
Direct Materials issued to production	5,88,000
Allocation of Wages (Indirect)	7,50,000
Factory Overheads (Over absorbed)	2,25,000
Administrative Overheads (Under absorbed)	1,55,000
Deficiency found in stock of Raw material (Normal)	2,00,000

[(5 Marks) May 2022]

Answer

Journal Entries

S. No.	*Entries*		*Dr.*	*Cr.*
(a)	Work-in-progress Ledger Control A/c To Store Ledger Control A/c (Being issue of direct materials to production)	Dr.	5,88,000 -	- 5,88,000
(b)	Factory Overhead Control A/c To Wages Control A/c (Being allocation of indirect wages)	Dr.	7,50,000 -	- 7,50,000
(c)	Factory Overhead Control A/c To Costing Profit & Loss A/c (Being transfer of over absorption of factory overhead)	Dr.	2,25,000 -	- 2,25,000
(d)	Costing Profit & Loss A/c To Administration Overhead Control A/c (Being transfer of under absorption of administration overhead)	Dr.	1,55,000 -	- 1,55,000
(e)	Factory Overhead Control A/c To Store Ledger Control A/c (Being transfer of deficiency in stock of raw material)	Dr.	2,00,000 -	- 2,00,000

SUGGESTED REVISION FOR EXAM:

BQ: 1, 2, 6, 9

PYQ: 1, 3, 4

CHAPTER 15 RECONCILIATION

INTEGRATED ACCOUNTING SYSTEM

BQ 1

During the year ended 31st March, 2023, the profit of a company stood at ₹36,450 as per financial records. The cost books however showed a profit of ₹51,950 for the same period.

Prepare a statement reconciling the profit as per cost records with the profit as per financial records.

(a)	Opening stock overstated in cost accounts	3,500
(b)	Closing stock understated in cost accounts	4,600
(c)	Factory overheads under recovered in cost accounts	2,500
(d)	Administration expenses over recovered in cost accounts	750
(e)	Selling and distribution expenses under recovered in cost accounts	1,650
(f)	Depreciation over recovered in cost accounts	1,500
(g)	Interest on investment not included cost accounts	5,000
(h)	Obsolescence loss in respect of machineries charged in financial accounts	2,450
(i)	Income tax provided in financial accounts	25,000
(j)	Bank interest credited in financial accounts	1,500
(k)	Stores adjustments (debit in financial book)	750

Answer

Reconciliation Statement

Particulars		*Amount*	*Amount*
	Profit as per Cost Books		***51,950***
Add:	Opening stock overstated	3,500	
	Closing stock understated	4,600	
	Administration expenses over recovered	750	
	Depreciation over recovered	1,500	
	Interest on investment	5,000	
	Bank interest credited	1,500	16,850
Less:	Factory overheads under recovered	2,500	
	Selling and distribution expenses under recovered	1,650	
	Obsolescence loss	2,450	
	Income tax provided	25,000	
	Stores adjustment (debit in financial book)	750	(32,350)
	Profit as per Financial Books		***36,450***

BQ 2

M/s. H.K. Piano Company showed a net loss of ₹4,16,000 as per their financial accounts for the year ended 31st March. The cost accounts, however, disclosed a net loss of ₹3,28,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of books:

(1)	Factory overheads under recovered	6,000
(2)	Administration overheads over recovered	4,000

(3)	Depreciation charged in financial accounts	1,20,000
(4)	Depreciation recovered in costs	1,30,000
(5)	Interest on investment not included costs	20,000
(6)	Income-tax provided	1,20,000
(7)	Transfer fees (credit in financial books)	2,000
(8)	Stores adjustments (credit in financial book)	2,000

Prepare a Memorandum reconciliation account.

Answer

Memorandum Reconciliation Account

Particulars	***Amount***	***Particulars***	***Amount***
To Net loss as per Cost A/c	***3,28,000***	By Admin. OH over recovered	4,000
To Factory OH under recovered	6,000	By Depreciation over recovered	10,000
To Income Tax	1,20,000	(1,30,000 – 1,20,000)	
		By Interest on investment	20,000
		By Transfer fees	2,000
		By Stores adjustment	2,000
		By Net loss as per Financial A/c	***4,16,000***
	4,54,000		***4,54,000***

BQ 3

Given below is the trading and profit and loss account of a company for the year ended 31st March 2023:

Particulars	***Amount***	***Particulars***		***Amount***
To Direct Materials	27,40,000	By Sales (60,000 units)		60,00,000
To Direct Wages	15,10,000	By Closing finished goods		1,60,000
To Factory Expenses	8,30,000	(2,000 units)		
To Administration Expenses	3,82,400	By Closing Work in progress:		
To Selling Expenses	4,50,000	Materials	64,000	
To Preliminary Expenses	60,000	Wages	36,000	
		Factory Expenses	20,000	1,20,000
To Net profit	3,25,600	By Dividend received		18,000
	62,98,000			***62,98,000***

The company manufactures standard units. In the cost Accounts:

(1) Factory expenses have been allocated to production at 20% of prime cost.
(2) Administrative expenses at ₹6 per unit produced.
(3) Selling expenses at ₹8 per unit sold.

Prepare the costing profit and loss account of the company and reconcile the same with the profit disclosed by the financial accounts.

Answer

Costing Profit & Loss Account

Particulars	***Amount***	***Particulars***	***Amount***
To Direct Materials	27,40,000	By Sales (60,000 units)	60,00,000
To Direct Wages	15,10,000	By Closing finished goods	1,72,645
To Factory Expenses	8,50,000	(2,000 units)	
To Administration Expenses	3,72,000	By Closing Work in progress	1,20,000
To Selling Expenses	4,80,000		
To Net profit	3,40,645		
	62,92,645		***62,92,645***

Reconciliation Statement

Particulars	Amount	Amount
Profit as per Cost Accounts		**3,40,645**
Add: Factory expenses over recovered (8,50,000 – 8,30,000)	20,000	
Selling expenses over recovered (4,80,000 – 4,50,000)	30,000	
Dividend received	18,000	68,000
Less: Administration overheads under recovered (3,82,400 - 3,72,000)	10,400	
Closing stock over valued (1,72,645 – 1,60,000)	12,645	
Preliminary expenses	60,000	(83,045)
Profit as per Financial Accounts		**3,25,600**

Working note:

(a) Factory expenses = 20% of prime cost
= 20% (27,40,000 + 15,10,000) = **₹8,50,000**

(b) Administration expenses = ₹6 × 62,000 units = **₹3,72,000**

(c) Selling expenses = ₹8 × 60,000 units = **₹4,80,000**

(d) Number of units produced = Units sold + Units in closing finished goods
= 60,000 + 2,000 = **62,000 units**

(e) Value of closing finished goods $= \frac{\text{Cost of Production}}{\text{Units Produced}} \times \text{Closing finished goods units}$

$= \frac{53,52,000}{62,000} \times 2,000$ = **₹1,72,645**

(f) Cost of production = 27,40,000 + 15,10,000 + 8,50,000 – 1,20,000 + 3,72,000
= **₹53,52,000**

BQ 4

The following figures are available from the financial records of ABC Manufacturing Co. Ltd. for the year ended 31.03.2023.

Particulars		₹
Sales (20,000 units)		25,00,000
Materials		10,00,000
Wages		5,00,000
Factory overheads		4,50,000
Office and administrative overheads (production related)		2,60,000
Selling and distribution overheads		1,80,000
Finished goods (1,230 units)		1,50,000
Work-in-process:		
Materials	30,000	
Labour	20,000	
Factory overheads	20,000	70,000
Goodwill written off		2,00,000
Interest on loan taken		20,000

In the Costing records, factory overhead is charged at 100% of wages, administration overhead 10% of factory cost and selling and distribution overhead at the rate of ₹10 per unit sold.

Prepare a statement reconciling the profit as per cost records with the profit as per financial records.

Answer

Profit & Loss Account of ABC Manufacturing Co. Ltd.
(For the year ended 31.03.2023)

Particulars	Amount	Particulars	Amount
To Opening finished goods	Nil	By Sales (20,000 units)	25,00,000
To Materials	10,00,000	By Closing stock:	
To Wages	5,00,000	Finished goods (1,230 units)	1,50,000
To Factory overheads	4,50,000	Work-in-process	70,000
To Office & Admin. overheads	2,60,000		
To Selling & distribution Overheads	1,80,000		
To Goodwill written off	2,00,000		
To Interest on loan	20,000		
To Profit	1,10,000		
	27,20,000		***27,20,000***

Cost Sheet

Particulars	Amount
Materials	10,00,000
Wages	5,00,000
Direct Expenses	Nil
Prime Cost	***15,00,000***
Factory overheads at 100% of wages	5,00,000
Less: Closing stock of WIP	(70,000)
Factory Cost	***19,30,000***
Office and administrative overheads at 10% of factory cost	1,93,000
Cost of Production (21,230 units)	***21,23,000***
Less: Closing stock of Finished goods {(21,23,000 ÷ 21,230) × 1,230 units}	(1,23,000)
Production cost of 20,000 units or COGS	***20,00,000***
Selling and distribution overheads at ₹10 per unit	2,00,000
Cost of sales	***22,00,000***
Profit (balancing figure)	3,00,000
Sales	***25,00,000***

Reconciliation Statement

Particulars	Amount	Amount
Profit as per Cost Accounts		***3,00,000***
Add: Factory overheads over recovered	50,000	
Selling and distribution overheads over recovered	20,000	
Closing stock under valued in costs	27,000	97,000
Less: Office and administrative overheads under recovered	67,000	
Goodwill written off	2,00,000	
Interest on loan	20,000	(2,87,000)
Profit as per Financial Accounts		***1,10,000***

BQ 5

The following figures have been extracted from the Financial Accounts of a manufacturing firm for the first year of its operation:

Particulars	₹

Direct material consumption	50,00,000
Direct wages	30,00,000
Factory overheads	16,00,000
General administration overheads	7,00,000
Selling and distribution overheads	9,60,000
Bad debts	80,000
Preliminary expenses written off	40,000
Legal charges	10,000
Dividends received	1,00,000
Interest received on deposits	20,000
Sales (1,20,000 units)	1,20,00,000
Closing stock:	
Finished goods (4,000 units)	3,20,000
Work-in-process	2,40,000

The cost accounts for the same period reveal that the direct material consumption was ₹56,00,000. Factory overhead is recovered at 20% on prime cost. Administration overhead is recovered at ₹6 per unit of goods sold. Selling and distribution overheads are recovered at ₹8 per unit sold.

Prepare the Profit and Loss Accounts as per financial records and Cost Sheet as per cost records. Reconcile the profits as per the two records.

Answer

Profit & Loss Account
(As per financial records)

Particulars	*Amount*	*Particulars*	*Amount*
To Materials	50,00,000	By Sales (1,20,000 units)	1,20,00,000
To Wages	30,00,000	By Closing stock:	
To Factory overheads	16,00,000	Finished goods (4,000 units)	3,20,000
To Gross profit c/d	29,60,000	Work-in-process	2,40,000
	1,25,60,000		***1,25,60,000***
To General administrave overheads	7,00,000	By Gross profit b/d	29,60,000
To Selling & distribution Overheads	9,60,000	By Dividends	1,00,000
To Bad debts	80,000	By Interest	20,000
To Preliminary expenses written off	40,000		
To Legal charges	10,000		
To Profit	12,90,000		
	30,80,000		***30,80,000***

Statement of Cost and Profit
(As per Cost Records)

Particulars	*Amount*
Direct materials	56,00,000
Direct wages	30,00,000
Prime Cost	***86,00,000***
Factory overheads (20% of 86,00,000)	17,20,000
Less: Closing stock of WIP	(2,40,000)
Cost of Production (1,24,000 units)	***1,00,80,000***
Less: Closing stock of Finished goods [(1,00,80,000 ÷ 1,24,000) × 4,000]	(3,25,161)
Cost of goods sold (1,20,000 units)	***97,54,839***
General administrative overheads (1,20,000 units @ ₹6 per unit)	7,20,000
Selling and distribution overheads (1,20,000 units @ ₹8 per unit)	9,60,000

Cost of sales	***1,14,34,839***
Net Profit (balancing figure)	5,65,161
Sales	***1,20,00,000***

Reconciliation Statement

Particulars		***Amount***	***Amount***
	Profit as per Cost Accounts		***5,65,161***
Add:	Excess of material consumption	6,00,000	
	Factory overheads over recovered	1,20,000	
	Administration overheads over recovered	20,000	
	Dividend received	1,00,000	
	Interest received	20,000	8,60,000
Less:	Closing stock over valued in costs (3,25,161 - 3,20,000)	5,161	
	Bad debts	80,000	
	Preliminary expenses written off	40,000	
	Legal charges	10,000	(1,35,161)
	Profit as per Financial Accounts		***12,90,000***

BQ 6

The financial books of a company reveal the following data for the year ended 31st March, 2023:

Opening stock:

Finished goods (625 units)	53,125
Work-in-process	46,000

During the year (01.04.22 to 31.03.23):

Raw materials consumed	8,40,000
Direct Labour	6,10,000
Factory overheads	4,22,000
Administration overheads (production related)	1,98,000
Dividend paid	1,22,000
Bad Debts	18,000
Selling and Distribution Overheads	72,000
Interest received	38,000
Rent received	46,000
Sales (12,615 units)	22,80,000

Closing stock:

Finished goods (415 units)	45,650
Work-in-process	41,200

The cost records provide as under:

- Factory overheads are absorbed at 70% of direct wages.
- Administration overheads are recovered at 15% of factory cost.
- Selling and distribution overheads are charged at ₹3 per unit sold.
- Opening stock of finished goods is valued at ₹120 per unit.
- The company values work-in-process at factory cost for both Financial and Cost Profit reporting.

Required:

(i) Prepare statements for the year ended 31st March, 2023 to show
- ***(a)*** The profit as per financial records
- ***(b)*** The profit as per costing records.

(ii) Present a statement reconciling the profit as per costing records with the profit as per Financial Records?

Answer

(i) (a) Financial Profit and Loss A/c

Particulars	Amount	Particulars	Amount
To Opening stock:		By Sales	22,80,000
WIP	46,000	By Closing stock:	
Finished goods	53,125	WIP	41,200
To Raw material consumed	8,40,000	Finished goods (375 units)	45,650
To Direct labour	6,10,000		
To Gross profit	8,17,725		
	23,66,850		**23,66,850**
To Factory overheads	4,22,000	By Gross profit	8,17,725
To Administrative overheads	1,98,000	By Interest received	38,000
To Selling & Distribution overheads	72,000	By Rent received	46,000
To Dividend Paid	1,22,000		
To Bad debts	18,000		
To Net Profit	69,725		
	9,01,725		**9,01,725**

(i) (b) Cost Sheet showing Costing P/L (Production 12,405 units)

Particulars	Amount
Direct Material	8,40,000
Direct labour	6,10,000
Prime Cost	**14,50,000**
Factory overhead (70% of direct wages)	4,27,000
Add: Opening WIP	46,000
Less: Closing WIP	(41,200)
Factory Cost	**18,81,800**
Administrative overhead (15% of factory cost)	2,82,270
Cost of Production	**21,64,070**
Add: Opening finished goods (₹120 × 625 units)	75,000
Less: Closing Stock of finished goods (W.N. 2)	(72,397)
Cost of Goods Sold	**21,66,673**
Selling & distribution overheads (₹3 × 12,615 units)	37,845
Cost of sales	**22,04,518**
Profit (balancing figure)	75,482
Sales	**22,80,000**

(ii) Reconciliation Statement

Particulars	Amount	Amount
Profit as per Cost Records (Cost Sheet)		**75,482**
Add: Interest Received	38,000	
Rent Received	46,000	
Administration overheads over recovered (2,82,270 – 1,98,000)	84,270	
Factory overheads over recovered (4,27,000 – 4,22,000)	21,875	
Opening stock overvalued (75,000 – 53,125)	5,000	**1,95,145**
Less: Dividend	1,22,000	
Bad debts	18,000	
Selling & distribution OH under recovered (72,000 – 37,845)	34,155	
Closing stock over valued (72,397 – 45,650)	26,747	**(2,00,902)**
Profit as per Financial Records		**69,725**

Working note:

(1) Number of units produced = Units sold + Closing finished units – Opening finished units

= 12,615 + 415 - 625 = ***12,405 units***

(2) Value of closing finished goods = $\frac{\text{Cost of Production}}{\text{Units Produced}}$ × Closing finished goods units

= $\frac{21,64,070}{12,405}$ × 415 = ***₹72,397***

Note: Closing stock is valued as per FIFO method.

BQ 7

The following information is available from the financial books of a company having a normal production capacity of 60,000 units of the year ended 31st March.

(1) Sales ₹10,00,000 (50,000 units).
(2) There was no opening and closing stock of finished units.
(3) Direct material and direct wages cost were ₹5,00,000 and ₹2,50,000 respectively.
(4) Actual factory expenses were ₹1,50,000 of which 60% are fixed.
(5) Actual administrative expenses were ₹45,000 which are completely fixed.
(6) Actual selling and distribution expenses were ₹30,000 of which 40% are fixed.
(7) Interest and dividends received ₹15,000.

You are required to:

(a) Find out profit as per financial books for the year ended 31st March.
(b) Prepare the cost sheet and ascertain the profit as per cost accounts for the year ended 31st March assuming that the indirect exp. are absorbed on the basis of normal production capacity.
(c) Prepare a statement reconciling profits shown by financial and cost books.

[Financial Profit: ₹40,000; Cost Profit: ₹49,500]

PAST YEAR QUESTIONS

PYQ 1

A manufacturing company has disclosed net loss of ₹48,700 as per their cost accounting records for the year ended 31st March, 2014. However their financial accounting records disclosed net profit of ₹35,400 for the same period.

A scrutiny of data of both the sets of books of accounts revealed the following informations:

(a)	Factory overheads under absorbed	₹30,500
(b)	Administrative overheads over absorbed	₹65,000
(c)	Depreciation charged in financial accounts	₹2,25,000
(d)	Depreciation charged in cost accounts	₹2,70,000
(e)	Income tax provision	₹52,400
(f)	Transfer fee (credited in financial accounts)	₹10,200
(g)	Obsolescence loss charged in financial accounts	₹20,700
(h)	Notional rent of own premises charged in cost accounts	₹54,000
(i)	Value of opening stock:	
	(a) In cost accounts	₹1,38,000
	(b) In financial accounts	₹1,15,000
(j)	Value of closing stock:	
	(c) In cost accounts	₹1,22,000
	(d) In financial accounts	₹1,12,500

Prepare a Memorandum Reconciliation Account by taking costing loss as base.

[(5 Marks) May 2014]

Answer

Memorandum Reconciliation Account

Particulars	***₹***	***Particulars***	***₹***
To Net loss as per Costing Books	***48,700***	By Admin OH over absorbed	65,000
To Factory OH under absorbed	30,500	By Depreciation over charged	45,000
To Income tax provision	52,400	(2,70,000 - 2,25,000)	
To Obsolescence loss	20,700	By Transfer fee	10,200
To Closing stock over valued	9,500	By Notional rent	54,000
To Net profit as per Fin. Books	***35,400***	By Opening stock over valued	23,000
	1,97,200		***1,97,200***

PYQ 2

The Trading and Profit and Loss Account of a company for the year ended 31.03.2016 is as under:

Particulars	***Amount***	***Particulars***	***Amount***
To Materials	26,80,000	By Sales (50,000 units)	62,00,000
To Wages	17,80,000	By Closing stock (2,000 units)	1,50,000
To Factory expenses	9,50,000	By Dividend received	20,000
To Administrative expenses	4,80,200		
To Selling expenses	2,50,000		
To Preliminary expenses written off	50,000		
To Net Profit	1,79,800		
	63,70,000		***63,70,000***

In the Cost Accounts:

(i) Factory expenses have been allocated to production at 20% of Prime Cost.
(ii) Administrative expenses absorbed at 10% of factory cost.
(iii) Selling expenses charged at ₹10 per unit sold.

Prepare the Costing Profit and Loss Account of the company and reconcile the Profit/Loss with the profit as shown in the Financial Accounts.

[(8 Marks) Nov 2016]

Answer

Costing Profit & Loss A/c

Particulars	Amount	Particulars	Amount
To Materials	26,80,000	By Sales (50,000 units)	62,00,000
To Wages	17,80,000	By Closing stock (2,000 units)	2,26,431
To Factory overheads	8,92,000		
To Administration overheads	5,35,200		
To S & D Expenses (50,000 × 10)	5,00,000		
To Net profit	39,231		
	64,26,431		***64,26,431***

Working notes:

1. Factory overheads in costs = 20% of Prime cost
= 20% of (26,80,000 + 17,80,000) = ***8,92,000***

2. Administrative overheads = 10% of Factory cost
= 10% of (26,80,000 + 17,80,000 + 8,92,000) = ***5,35,200***

3. Valuation of closing stock = $\frac{\text{Cost of production}}{\text{Units produced}} \times \text{Units in Closing stock}$

= $\frac{26,80,000 + 17,80,000 + 8,92,000 + 5,35,200}{52,000} \times 2,000$

= ***2,26,431***

4. Units produced = Units sold + Closing units – Opening units
= 50,000 + 2,000 – Nil = ***52,000***

Reconciliation Statement

Particulars	Amount	Amount
Profit as per Cost Accounts		***39,231***
Add: Administrative expenses over recovered (5,35,200 – 4,80,200)	55,000	
Selling expenses over recovered (5,00,000 – 2,50,000)	2,50,000	
Dividend received	20,000	3,25,000
Less: Factory expenses under recovered (9,50,000 – 8,92,000)	58,000	
Closing stock over valued in costs (2,26,431 – 1,50,000)	76431	
Preliminary expenses written off	50,000	(1,84,431)
Profit as per Financial Accounts		***1,79,800***

PYQ 3

GK Limited showed a net loss of ₹2,43,300 as per their financial accounts for the year ended 31st March, 2018. However, cost accounts disclosed a net loss of ₹2,48,300 for the same period. On scrutinizing both the set of books of accounts, the following information were revealed:

(a)	Works overheads over recovered	30,400
(b)	Selling overheads under recovered	20,300
(c)	Administrative overhead under recovered	27,700
(d)	Depreciation over charged in cost accounts	35,100
(e)	Bad debts w/off in financial accounts	15,000
(f)	Preliminary Exp. w/off in financial accounts	5,000
(g)	Interest credited during the year in financial accountants	7,500

Prepare a reconciliation statement reconciling losses shown by financial and cost accounts by taking costing net loss as base.

[(5 marks) Nov 2018]

Answer

Reconciliation Statement

Particulars	***Amount***	***Amount***
Loss as per Cost Records		***(2,48,300)***
Add: Factory overhead over recovered	30,400	
Depreciation over charged in cost accounts	35,100	
Interest credited during the year in financial accounts	7,500	73,000
Less: Selling overheads under recovered	20,300	
Administrative overheads under recovered	27,700	
Bad debts w/off in financial accounts	15,000	
Preliminary Exp. w/off in financial accounts	5,000	(68,000)
Profit as per Financial Books		***(2,43,300)***

PYQ 4

M/s Abid Private Limited disclosed a net profit of ₹48,408 as per cost books for the year ending 31st March 2019. However, financial accounts disclosed net loss of ₹15,000 for the same period. On scrutinizing both the set of books of accounts, the following information was revealed:

Works Overheads under recovered in Cost Books	48,600
Office Overheads over recovered in Cost Books	11,500
Dividend received on Shares	17,475
Interest on Fixed Deposits	21,650
Provision for doubtful debts	17,800
Obsolescence loss not charged in Cost Accounts	17,200
Stores adjustments (debited in Financial Accounts)	35,433
Depreciation charged in financial accounts	30,000
Depreciation recovered in Cost Books	35,000

Prepare a Memorandum Reconciliation Account.

[(5 Marks) May 2019]

Answer

Memorandum Reconciliation Account

Particulars	***₹***	***Particulars***	***₹***
To Works OH under recovered	48,600	***By Net profit as per Costing Books***	***48,408***
To Provision for doubtful debts	17,800	By Admin overheads over recovered	11,500
To Obsolescence loss	17,200	By Dividend received	17,475

To Stores adjustments	35,433	By Interest on fixed deposits	21,650
		By Depreciation over recovered (35,000 - 30,000)	5,000
		By Net loss as per Financial Books	***15,000***
	1,19,033		***1,19,033***

PYQ 5

The Profit and Loss account of ABC Ltd. for the year ended 31st March, 2021 is given below:

Profit & Loss Account
(For the year ended 31st March, 2021)

To Direct Material	6,50,000	By Sales (15,000 units)	15,00,000
To Direct Wages	3,50,000	By Dividend received	9,000
To Factory overheads	2,60,000		
To Administrative overheads	1,05,000		
To Selling overheads	85,000		
To Loss on sale of investments	2,000		
To Net profit	57,000		
	15,09,000		***15,09,000***

Additional information:

(a) The factory overheads are 50% fixed and 50% variable.
(b) The administration overheads are 100% fixed.
(c) Selling overheads are completely variable.
(d) Normal production capacity of ABC Ltd. is 20,000 units.
(e) Indirect expenses are absorbed in the cost accounts on the basis of normal production capacity.
(f) Notional rent of own premises charged in Cost Accounts is amounting to ₹12,000.

You are required to:

(1) Prepare a Cost Sheet and ascertain the profit as per Cost records for the year ended 31st March, 2021.
(2) Reconcile the Profit as per Financial Records with profit as per Cost Records.

[(10 Marks) July 2021]

Answer

(1) Cost Sheet

Particulars	***Amount (₹)***
Direct Materials	6,50,000
Direct Wages	3,50,000
Prime Cost	***10,00,000***
Factory Overheads:	
Variable (2,60,000 × 50%)	1,30,000
Fixed {(2,60,000 × 50%) × 15,000/20,000}	97,500
Factory Cost	***12,27,500***
Administrative Overheads (1,05,000 ×15,000/20,000)	78,750
Notional rent	12,000
Cost of Production	***13,18,250***
Selling Overheads (completely variable)	85,000
Cost of sales	***14,03,250***
Profit (balancing figure)	96,750
Sales	***15,00,000***

(2) Reconciliation Statement

Particulars	Amount
Profit as per Cost Accounts	**96,750**
Add: Dividend received	9,000
Notional rent	12,000
Less: Factory overheads under recovered (2,60,000 – 1,30,000 – 97,500)	32,500
Administration overheads under recovered (1,05,000 – 78,750)	26,250
Loss on sale of investments	2,000
Profit as per Financial Accounts	**57,000**

PYQ 6

R Ltd. showed a Net Profit of ₹3,60,740 as per their cost accounts for the year ended 31st March, 2021. The following information was revealed as a result of scrutiny of the figures from the both sets of accounts:

(a)	Over recovery of selling overheads in cost accounts	10,250
(b)	Over valuation of closing stock in cost accounts	7,300
(c)	Rent received credited in financial accounts	5,450
(d)	Bad debts provided in financial accounts	3,250
(e)	Income tax provided in financial accounts	15,900
(f)	Loss on sale of capital asset debited in financial accounts	5,800
(g)	Under recovery of administration overheads in cost accounts	3,600

Required: Prepare a reconciliation statement showing the profit as per financial records.

[(5 Marks) Dec 2021]

Answer

Reconciliation Statement

Particulars	Amount	Amount
Profit as per Cost Books		**3,60,740**
Add: Over recovery of selling overheads in cost accounts	10,250	
Rent received credited in financial accounts	5,450	15,700
Less: Over valuation of closing stock in cost accounts	7,300	
Bad debts provided in financial accounts	3,250	
Income tax provided in financial accounts	15,900	
Loss on sale of capital asset debited in financial accounts	5,800	
Under recovery of administration overheads in cost accounts	3,600	(35,850)
Profit as per Financial Books		**3,40,590**

PYQ 7

'X' Ltd. follows Non-Integrated Accounting System. Financial Accounts of the company show a Net Profit of ₹5,50,000 For the year ended 31st March, 2022. The chief accountant of the company has provided following information form the Financial Accounts and Cost Accounts:

SN.	Particulars	(₹)
(i)	Legal Charges provided in financial accounts	15,250
(ii)	Interim Dividend received credited in financial accounts	4,50,000
(iii)	Preliminary Expenses written off in financial accounts	25,750
(iv)	Over recovery of selling overheads in cost accounts	11,380
(v)	Profit on sale of capital asset credited in financial accounts	30,000

(vi)	Under valuation of closing stock in cost accounts	25,000
(vii)	Over recovery of production overheads in cost accounts	10,200
(viii)	Interest paid on Debentures shown in financial accounts	50,000

Find out the Profit (Loss) as per Cost Accounts by preparing a Reconciliation Statement.

[(5 Marks) Nov 2022]

Answer

Reconciliation Statement

Particulars		***Amount***	***Amount***
Profit as per Financial Books			***5,50,000***
Add:	Legal charges	15,250	
	Preliminary expenses	25,750	
	Interest paid on debentures	50,000	91,000
Less:	Interim dividend received	4,50,000	
	Over recovery of selling overheads	11,380	
	Profit on sale of capital assets	30,000	
	Under valuation of closing stock in cost accounts	25,000	
	Over recovery of production overheads	10,200	(5,26,580)
Profit as per Cost Books			***1,14,420***

PYQ 8

The following has been obtained from financial accounting and cost accounting records.

	Financial Accounting	***Cost Accounting***
Factory Overhead	94,750	90,000
Administrative overhead	60,000	57,000
Selling Overhead	55,000	61,500
Opening Stock	17,500	22,500
Closing Stock	12,500	15,000

Indicate under-recovery and over-recovery and their effects on cost accounting profit.

Note: You are not required to prepare reconciliation statement.

[(5 Marks) May 2023]

Answer

Particulars	***Financial Accounting***	***Cost Accounting***	***Under-over Recovered***	***Effect on Cost Accounting Profit***
Factory Overhead	94,750	90,000	4,750 under recovered	Increased
Administrative overhead	60,000	57,000	3,000 under recovered	Increased
Selling Overhead	55,000	61,500	6,500 over recovered	Decreased
Opening Stock	17,500	22,500	5,000 over valued	Decreased
Closing Stock	12,500	15,000	2,500 over valued	Increased

SUGGESTED REVISION FOR EXAM:

BQ: 3, 4, 6

PYQ: 1, 4, 5