

CA Inter Cost **SUPER** **111**



For
May 26



AIR 30
CA Amit Sharma



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CHAPTER

Cost Sheet

Q.1

Calculation of Cost Sheet

PY May 19



M/s Areeba Private Limited has a normal production capacity of 36,000 units of toys per annum. The estimated costs of production are as under:

- (i) Direct Material ₹ 40 per unit
 - (ii) Direct Labour ₹ 30 per unit (subject to a minimum of ₹ 48,000 p.m.)
 - (iii) Factory Overheads:
 - (a) Fixed ₹ 3,60,000 per annum
 - (b) Variable ₹ 10 per unit
 - (c) Semi-variable ₹ 1,08,000 per annum up to 50% capacity and additional ₹ 46,800 for every 20% increase in capacity or any part thereof.
 - (iv) Administrative Overheads ₹ 5, 18,400 per annum (fixed)
 - (v) Selling overheads are incurred at ₹ 8 per unit.
 - (vi) Each unit of raw material yields scrap which is sold at the rate of ₹ 5 per unit.
 - (vii) In year 2019, the factory worked at 50% capacity for the first three months but it was expected that it would work at 80% capacity for the remaining nine months.
 - (viii) During the first three months, the selling price per unit was ₹ 145.
- You are required to:
- (i) Prepare a cost sheet showing Prime Cost, Works Cost, Cost of Production and Cost of Sales.
 - (ii) Calculate the selling price per unit for remaining nine months to achieve the total annual profit of ₹ 8,76,600.

Ans.

(i) Cost Sheet of M/s Areeba Pvt. Ltd. for the year 2019.

Normal Capacity: 36,000 units p.a.

Particulars	3 Months 4,500 Units		9 Months 21,600 units	
	Amount (₹)	Cost per unit (₹)	Amount (₹)	Cost per unit (₹)
Direct material	1,80,000		8,64,000	
Less: Scrap	(22,500)		(1,08,000)	
Materials consumed	1,57,500	35	7,56,000	35
Direct Wages	1,44,000	32	6,48,000	30
Prime Cost	3,01,500	67	14,04,000	65
Factory overheads:				
- Fixed	90,000		2,70,000	
- Variable	45,000		2,16,000	
- Semi variable	27,000	36	1,51,200	29.50
Works Cost	4,63,500	103	20,41,200	94.50
Add: Administrative overheads	1,29,600	28.80	3,88,800	18
Cost of Production	5,93,100	131.80	24,30,000	112.5
Selling Overheads	36,000	8	1,72,800	8
Cost of Sales	6,29,100	139.80	26,02,800	120.5

Working Notes:

Calculation of Costs

Particulars	4,500 units Amount (₹)	21,600 units Amount (₹)
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Material	1,80,000 (₹ 40 × 4,500 units)	8,64,000 (₹40 × 21,600 units)
Wages	1,44,000 (Max. of ₹ 30 × 4,500 units = ₹1,35,000 and ₹ 48,000 × 3 months = ₹1,44,000)	6,48,000 (21600 Units × 30)
Variable Cost	45,000 (₹10 × 4,500 units)	2,16,000 (₹10 × 21,600 units)
Semi-variable Cost	27,000 $\left(\frac{1,08,000}{12 \text{ Months}} \times 3 \text{ Months} \right)$	1,51,200 $\left(\frac{1,08,000}{12 \text{ Months}} \times 9 \text{ Months} \right)$
		+46,800(for 20 % increase) +23,400(for 10% increase)
Selling Overhead	36,000 (₹8 × 4,500 units)	1,72,800(₹ 8 × 21,600 units)

Notes:

- Alternatively scrap of raw material can also be reduced from Work cost.
- Administrative overhead may be treated alternatively as a part of general overhead. In that case, Works Cost as well as Cost of Production will be same i.e. ₹ 4,63,500 and Cost of Sales will remain same as ₹ 6,29,100.

(ii) Calculation of Selling price for nine months period

Particulars	Amount (₹)
Total Cost of sales ₹ (6,29,100+26,02,800)	32,31,900
Add: Desired profit	8,76,600
Total sales value	41,08,500
Less: Sales value realised in first three months (₹145 × 4,500 units)	(6,52,500)
Sales Value to be realised in next nine months	34,56,000
No. of units to be sold in next nine months	21,600
Selling price per unit (₹34,56,000 ÷ 21,600 units)	160

Q.2

Calculation of Cost Sheet

PY Nov 19



XYZ a manufacturing firm, has revealed following information for September ,2019:

	1st September (₹)	30th September (₹)
Raw Materials	2,42,000	2,92,000
Works-in-progress	2,00,000	5,00,000

The firm incurred following expenses for a targeted production of 1,00,000 units during the month :

	(₹)
Consumable Stores and spares of factory	3,50,000
Research and development cost for process improvements	2,50,000
Quality control cost	2,00,000
Packing cost (secondary) per unit of goods sold	2
Lease rent of production asset	2,00,000
Administrative Expenses (General)	2,24,000
Selling and distribution Expenses	4,13,000
Finished goods (opening)	Nil
Finished goods (closing)	5000 units

Defective output which is 4% of targeted production, realizes ₹ 61 per unit. Closing stock is valued at cost of production (excluding administrative expenses) Cost of goods sold, excluding administrative expenses amounts to ₹ 78,26,000. Direct employees cost is 1/2 of the cost of material consumed.



Selling price of the output is ₹ 110 per unit. You are required to :

- Calculate the Value of material purchased
- Prepare cost sheet showing the profit earned by the firm.

Ans.

Workings:

1. Calculation of Sales Quantity:

Particular	Units
Production units	1,00,000
Less: Defectives (4%×1,00,000 units)	4,000
Less: Closing stock of finished goods	5,000
No. of units sold	91,000

2. Calculation of Cost of Production

Particular	Amount (₹)
Cost of Goods sold (given)	78,26,000
Add: Value of Closing finished goods	4,30,000
$\left(\frac{78,26,000}{91,000 \text{ units}} \times 5,000 \text{ units} \right)$	
Cost of Production	82,56,000

3. Calculation of Factory Cost

Particular	Amount (₹)
Cost of Production	82,56,000
Less: Quality Control Cost	(2,00,000)
Less: Research and Development Cost	(2,50,000)
Add: Credit for Recoveries/Scrap/By-Products/misc. income (1,00,000 units × 4% × ₹ 61)	2,44,000
Factory Cost	80,50,000

4. Calculation of Gross Factory Cost

Particular	Amount (₹)
Cost of Factory Cost	80,50,000
Less: Opening Work in Process	(2,00,000)
Add: Closing Work in Process	5,00,000
Cost of Gross Factory Cost	83,50,000

5. Calculation of Prime Cost

Particular	Amount (₹)
Cost of Gross Factory Cost	83,50,000
Less: Consumable stores & spares	(3,50,000)
Less: Lease rental of production assets	(2,00,000)
Prime Cost	78,00,000

6. Calculation of Cost of Materials Consumed & Labour cost

Let Cost of Material Consumed = M and Labour cost = 0.5M

Prime Cost = Cost of Material Consumed + Labour Cost 78,00,000 = M + 0.5M

M = 52,00,000

Therefore, Cost of Material Consumed = ₹ 52,00,000 and Labour Cost = ₹ 26,00,000

(i) Calculation of Value of Materials Purchased

Particular	Amount (₹)
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Cost of Material Consumed	52,00,000
Add: Value of Closing stock	2,92,000
Less: Value of Opening stock	(2,42,000)
Value of Materials Purchased	52,50,000

Cost Sheet

Sl.	Particulars	Total Cost (₹)
1.	Direct materials consumed:	
	Opening Stock of Raw Material	2,42,000
	Add: Additions/ Purchases [balancing figure as per requirement (i)]	52,50,000
	Less: Closing stock of Raw Material	(2,92,000)
	Material Consumed	52,00,000
2.	Direct employee (labour) cost	26,00,000
3.	Prime Cost (1+2)	78,00,000
4.	Add: Works/ Factory Overheads Consumable stores and spares	
	Lease rent of production asset	3,50,000
		2,00,000
5.	Gross Works Cost (3+4)	83,50,000
6.	Add: Opening Work in Process	2,00,000
7.	Less: Closing Work in Process	(5,00,000)
8.	Works/ Factory Cost (5+6-7)	80,50,000
9.	Add: Quality Control Cost	2,00,000
10.	Add: Research and Development Cost	2,50,000
11.	Less: Credit for Recoveries/Scrap/By-Products/misc. income	(2,44,000)
12.	Cost of Production (8+9+10-11)	82,56,000
13.	Add: Opening stock of finished goods	-
14.	Less: Closing stock of finished goods (5000 Units)	(4,30,000)
15.	Cost of Goods Sold (12+13-14)	78,26,000
16.	Add: Administrative Overheads (General)	2,24,000
17.	Add: Secondary packing	1,82,000
18.	Add: Selling Overheads & Distribution Overheads	4,13,000
19.	Cost of Sales (15+16+17+18)	86,45,000
20.	Profit	13,65,000
21.	Sales 91,000 units ₹ 110 per unit	1,00,10,000

Q.3

Calculation of Cost Sheet

PY July 21



The following data relates to manufacturing of a standard product during the month of March, 2021:

Particulars	Amount (in ₹)
Stock of Raw material as on 01-03-2021	80,000
Work in Progress as on 01-03-2021	50,000
Purchase of Raw material	2,00,000
Carriage Inwards	20,000
Direct Wages	1,20,000
Cost of special drawing	30,000
Hire charges paid for Plant	24,000





Return of Raw Material	40,000
Carriage on return	6,000
Expenses for participation in Industrial exhibition	8,000
Legal charges	2,500
Salary to office staff	25,000
Maintenance of office building	2,000
Depreciation on Delivery van	6,000
Warehousing charges	1,500
Stock of Raw material as on 31-03-2021	30,000
Stock of Work in Progress as on 31-03-2021	24,000

- Store overheads on materials are 10% of material consumed.
- Factory overheads are 20% of the Prime cost.
- 10% of the output was rejected and a sum of ₹ 5,000 was realized on sale of scrap.
- 10% of the finished product was found to be defective and the defective products were rectified at an additional expenditure which is equivalent to 20% of proportionate direct wages.
- The total output was 8000 units during the month.

You are required to prepare a Cost Sheet for the above period showing the:

- Cost of Raw Material consumed.
- Prime Cost
- Work Cost
- Cost of Production
- Cost of Sales.

Ans.

Statement of Cost for the month of March, 2021

Particulars	Amount (₹)	Amount (₹)
(i) Cost of Material Consumed:		
Raw materials purchased (₹ 2,00,000 - ₹ 40,000)	1,60,000	
Carriage inwards	20,000	
Add: Opening stock of raw materials	80,000	
Less: Closing stock of raw materials	(30,000)	2,30,000
Direct Wages		1,20,000
Direct expenses:		
Cost of special drawing	30,000	
Hire charges paid for Plant	24,000	54,000
(ii) Prime Cost		4,04,000
Carriage on return	6,000	
Store overheads (10% of material consumed)	23,000	
Factory overheads (20% of Prime cost)	80,800	
Additional expenditure for rectification of defective products (refer working note)	2,160	1,11,960
Gross factory cost		5,15,960
Add: Opening value of W-I-P		50,000
Less: Closing value of W-I-P		(24,000)
(iii) Works/ Factory Cost		5,41,960
Less: Realisable value on sale of scrap		(5,000)
(iv) Cost of Production		5,36,960
Add: Opening stock of finished goods		-
Less: Closing stock of finished goods		-
Cost of Goods Sold		5,36,960
Administrative overheads:		



Maintenance of office building	2,000	
Salary paid to Office staff	25,000	
Legal Charges	2,500	29,500
Selling overheads:		
Expenses for participation in Industrial exhibition	8,000	8,000
Distribution overheads:		
Depreciation on delivery van	6,000	
Warehousing charges	1,500	7,500
(v) Cost of Sales		5,81,960

Alternative Solution

(considering Hire charges paid for Plant as indirect expenses)

Statement of Cost for the month of March, 2021

Particulars	Amount (₹)	Amount (₹)
Cost of Material Consumed:		
Raw materials purchased (₹ 2,00,000 - ₹ 40,000)	1,60,000	
Carriage inwards	20,000	
Add: Opening stock of raw materials	80,000	
Less: Closing stock of raw materials	(30,000)	2,30,000
Direct Wages		1,20,000
Direct expenses:		
Cost of special drawing	30,000	30,000
Prime Cost		3,80,000
Hire charges paid for Plant	24,000	
Carriage on return	6,000	
Store overheads (10% of material consumed)	23,000	
Factory overheads (20% of Prime cost)	76,000	
Additional expenditure for rectification of defective products (refer working note)	2,160	1,31,160
Gross factory cost		5,11,160
Add: Opening value of W-I-P		50,000
Less: Closing value of W-I-P		(24,000)
Works/ Factory Cost		5,37,160
Less: Realisable value on sale of scrap		(5,000)
Cost of Production		5,32,160
Add: Opening stock of finished goods		-
Less: Closing stock of finished goods		-
Cost of Goods Sold		5,32,160
Administrative overheads:		
Maintenance of office building	2,000	
Salary paid to Office staff	25,000	
Legal Charges	2,500	29,500
Selling overheads:		
Expenses for participation in Industrial exhibition	8,000	8,000
Distribution overheads:		
Depreciation on delivery van	6,000	
Warehousing charges	1,500	7,500
Cost of Sales		5,77,160

Working Notes:

- Number of Rectified units



- | | |
|--|------------------|
| Total Output | 8,000 units |
| Less: Rejected 10% | 800 units |
| Finished product | 7,200 units |
| Rectified units (10% of finished product) | 720 units |
2. **Proportionate additional expenditure on 720 units**
 = 20% of proportionate direct wages
 = $0.20 \times (\text{₹ } 1,20,000 / 8,000) \times 720$
 = ₹ 2,160

Q.4

Calculation of Cost Sheet

PY Dec 21



G Ltd. manufactures leather bags for office and school purposes.

The following information is related with the production of leather bags for the month of September, 2021.

- (1) Leather sheets and cotton clothes are the main inputs and the estimated requirement per bag is two metres of leather sheets and one metre of cotton cloth. 2,000 metre of leather sheets and 1,000 metre of cotton cloths are purchased at ₹ 3,20,000 and ₹ 15,000 respectively. Freight paid on purchases is ₹ 8,500.
- (2) Stitching and finishing need 2,000 man hours at ₹ 80 per hour.
- (3) Other direct costs of ₹ 10 per labour hour is incurred.
- (4) G Ltd. have 4 machines at a total cost of ₹ 22,00,000. Machines have a life of 10 years with a scrap value of 10% of the original cost. Depreciation is charged on a straight-line method.
- (5) The monthly cost of administration and sales office staffs are ₹ 45,000 and ₹ 72,000 respectively. G Ltd. pays ₹ 1,20,000 per month as rent for a 2,400 sq. feet factory premises. The administrative and sales office occupies 240 sq. feet and 200 sq. feet respectively of factory space.
- (6) Freight paid on delivery of finished bags is ₹ 18,000.
- (7) During the month, 35 kgs of scrap (cuttings of leather and cotton) are sold at ₹ 150 per kg.
- (8) There are no opening and closing stocks of input materials. There is a finished stock of 100 bags in stock at the end of the month.

You are required to prepare a cost sheet in respect of above for the month of September 2021 showing:

- (i) Cost of Raw Material Consumed
- (ii) Prime Cost
- (iii) Works/Factory Cost
- (iv) Cost of Production
- (v) Cost of Goods Sold
- (vi) Cost of Sales

Ans.

No. of bags manufactured = 1,000 units

Cost sheet for the month of September 2021

	Particulars	Total Cost (₹)	Cost per unit (₹)
1.	Direct materials consumed:		
	- Leather sheets	3,20,000	320.00
	- Cotton cloths	15,000	15.00
	Add: Freight paid on purchase	8,500	8.50
	(i) Cost of material consumed	3,43,500	343.50
2.	Direct wages (₹80 × 2,000 hours)	1,60,000	160.00
3.	Direct expenses (₹10 × 2,000 hours)	20,000	20.00
4.	(ii) Prime Cost	5,23,500	523.50
5.	Factory Overheads: Depreciation on machines {(₹ 22,00,000 × 90%) ÷ 120 months}	16,500	16.50
	Apportioned cost of factory rent	98,000	98.00
6.	(iii) Works/ Factory Cost	6,38,000	638.00

7.	Less: Realisable value of cuttings (₹150×35 kg.)	(5,250)	(5.25)
8.	(iv) Cost of Production	6,32,750	632.75
9.	Add: Opening stock of bags	0	
10.	Less: Closing stock of bags (100 bags × ₹632.75)	(63,275)	
11.	(v) Cost of Goods Sold	5,69,475	632.75
12.	Add: Administrative Overheads:		
	- Staff salary	45,000	50.00
	Apportioned rent for administrative office	12,000	13.33
13.	Add: Selling and Distribution Overheads		
	- Staff salary	72,000	80.00
	- Apportioned rent for sales office	10,000	11.11
	- Freight paid on delivery of bags	18,000	20.00
14.	(vi) Cost of Sales	7,26,475	807.19

Apportionment of Factory rent:

To factory building {(₹ 1,20,000 ÷ 2400 sq. feet) × 1,960 sq. feet} = ₹ 98,000 To administrative office {(₹ 1,20,000 ÷ 2400 sq. feet) × 240 sq. feet} = ₹ 12,000 To sale office {(₹ 1,20,000 ÷ 2400 sq. feet) × 200 sq. feet} = ₹ 10,000

Q.5

Calculation of Cost Sheet

ICAI MAT



Arnav Inspat Udyog Ltd. has the following expenditures for the year ended 31st March 2023:

Sl. No.		(₹)	(₹)
(i)	Raw materials purchased		10,00,00,000
(ii)	GST paid on the above purchases @18% (eligible for input tax credit)		1,80,00,000
(iii)	Freight inwards		11,20,600
(iv)	Wages paid to factory workers		29,20,000
(v)	Contribution made towards employees' PF & ESIS		3,60,000
(vi)	Production bonus paid to factory workers		2,90,000
(vii)	Royalty paid for production		1,72,600
(viii)	Amount paid for power & fuel		4,62,000
(ix)	Amount paid for purchase of moulds and patterns (life is equivalent to two years production)		8,96,000
(x)	Job charges paid to job workers		8,12,000
(xi)	Stores and spares consumed		1,12,000
(xii)	Depreciation on:		
	Factory building	84,000	
	Office building	56,000	
	Plant & Machinery	1,26,000	
	Delivery vehicles	86,000	3,52,000
(xiii)	Salary paid to supervisors		1,26,000
(xiv)	Repairs & Maintenance paid for: Plant & Machinery	48,000	



	Sales office building	18,000	
	Vehicles used by directors	19,600	85,600
(xv)	Insurance premium paid for:		
	Plant & Machinery	31,200	
	Factory building	18,100	
	Stock of raw materials & WIP	36,000	85,300
(xvi)	Expenses paid for quality control check activities		19,600
(xvii)	Salary paid to quality control staffs		96,200
(xviii)	Research & development cost paid for improvement in production process		18,200
(xix)	Expenses paid for pollution control and engineering & maintenance		26,600
(xx)	Expenses paid for administration of factory work		1,18,600
(xxi)	Salary paid to functional managers:		
	Production control	9,60,000	
	Finance & Accounts	9,18,000	
	Sales & Marketing	10,12,000	28,90,000
(xxii)	Salary paid to General Manager		12,56,000
(xxiii)	Packing cost paid for:		
	Primary packing necessary to maintain quality	96,000	
	For re-distribution of finished goods	1,12,000	2,08,000
(xxiv)	Interest and finance charges paid (for usage of non-equity fund)		7,20,000
(xxv)	Fee paid to auditors		1,80,000
(xxvi)	Fee paid to legal advisors		1,20,000
(xxvii)	Fee paid to independent directors		2,20,000
(xxviii)	Performance bonus paid to sales staffs		1,80,000
(xxix)	Value of stock as on 1st April, 2022:		
	Raw materials	18,00,000	
	Work-in-process	9,20,000	
	Finished goods	11,00,000	38,20,000
(xxx)	Value of stock as on 31st March, 2023:		
	Raw materials	9,60,000	
	Work-in-process	8,70,000	
	Finished goods	18,00,000	36,30,000

Amount realized by selling of scrap and waste generated during manufacturing process - ₹ 86,000/-

From the above data you are required to PREPARE Statement of cost for Arnab Ispat Udyog Ltd. for the year ended 31st March, 2023, showing (i) Prime cost, (ii) Factory cost, (iii) Cost of Production, (iv) Cost of goods sold and (v) Cost of sales.

Ans.

Statement of Cost of Arnav Ispat Udyog Ltd. for the year ended 31st March, 2023:

Sl.No.	Particulars	(₹)	(₹)
(i)	Material Consumed:		
	Raw materials purchased	10,00,00,000	
	Freight inwards	11,20,600	
	Add: Opening stock of raw materials	18,00,000	
	Less: Closing stock of raw materials	(9,60,000)	10,19,60,600
(ii)	Direct employee (labour) cost:		
	Wages paid to factory workers	29,20,000	
	Contribution made towards employees' PF & ESIS	3,60,000	
	Production bonus paid to factory workers	2,90,000	35,70,000
(iii)	Direct expenses:		
	Royalty paid for production	1,72,600	
	Amount paid for power & fuel	4,62,000	
	Amortised cost of moulds and patterns	4,48,000	
	Job charges paid to job workers	8,12,000	18,94,600
	Prime Cost		10,74,25,200
(iv)	Works/ Factory overheads:		
	Stores and spares consumed	1,12,000	
	Depreciation on factory building	84,000	
	Depreciation on plant & machinery	1,26,000	
	Repairs & Maintenance paid for plant & machinery	48,000	
	Insurance premium paid for plant & machinery	31,200	
	Insurance premium paid for factory building	18,100	
	Insurance premium paid for stock of raw materials & WIP	36,000	
	Salary paid to supervisors	1,26,000	
	Expenses paid for pollution control and engineering & maintenance	26,600	6,07,900
	Gross factory cost		10,80,33,100
	Add: Opening value of W-I-P		9,20,000
	Less: Closing value of W-I-P		(8,70,000)
	Factory Cost		10,80,83,100
(v)	Quality control cost:		
	Expenses paid for quality control check activities	19,600	
	Salary paid to quality control staffs	96,200	1,15,800
(vi)	Research & development cost paid for improvement in production process		18,200
(vii)	Administration cost related with production:		
	-Expenses paid for administration of factory work	1,18,600	



	-Salary paid to Production control manager	9,60,000	10,78,600
(viii)	Less: Realisable value on sale of scrap and waste		(86,000)
(ix)	Add: Primary packing cost		96,000
	Cost of Production		10,93,05,700
	Add: Opening stock of finished goods		11,00,000
	Less: Closing stock of finished goods		(18,00,000)
	Cost of Goods Sold		10,86,05,700
(x)	Administrative overheads:		
	Depreciation on office building	56,000	
	Repairs & Maintenance paid for vehicles used by directors	19,600	
	Salary paid to Manager- Finance & Accounts	9,18,000	
	Salary paid to General Manager	12,56,000	
	Fee paid to auditors	1,80,000	
	Fee paid to legal advisors	1,20,000	
	Fee paid to independent directors	2,20,000	27,69,600
(xi)	Selling overheads:		
	Repairs & Maintenance paid for sales office building	18,000	
	Salary paid to Manager- Sales & Marketing	10,12,000	
	Performance bonus paid to sales staffs	1,80,000	12,10,000
(xii)	Distribution overheads:		
	Depreciation on delivery vehicles	86,000	
(xiii)	Packing cost paid for re-distribution of finished goods	1,12,000	1,98,000
(xiv)	Interest and finance charges paid		7,20,000
	Cost of Sales		11,35,03,300

Note:

GST paid on purchase of raw materials would not be part of cost of materials as it is eligible for input tax credit.

Q.6

PY Nov 23



The following data relate to the manufacture of a product 'VD-100*' during the month of October 2023:

Good units produced	12,600
Units Sold	11,800
Direct wages	₹ 8,82,000
Administrative Overheads	₹ 4,72,000
Selling price per unit	₹ 416

Each unit produced requires 2 kg. of material 'Z'. Cost of material 'Z' is ₹ 72 per kg. 10% of the production has been scrapped as bad and fetches ₹ 45 per unit. Factory overheads are 80% of wages. Selling and distribution overheads are ₹ 54 per unit sold. There is no opening or closing stock of material and work in progress.

You are required to find out total cost of sales and profit for the month of October 2023.

Ans. Since 10% units are scrapped.

Units produced (total) is 14,000 (12,600/90%)

Calculation of cost of sales and profit

Particulars	₹
Raw Material (28,000 × ₹ 72)	20,16,000
Wages	8,82,000
Prime Cost	28,98,000
Factory overheads	7,05,600
Factory Cost	36,03,600
Sale of Scrap (1,400 × ₹ 45)	(63,000)
Cost of Production	35,40,600
Less: Closing Stock of finished goods $\left(\frac{35,40,600}{12,600} \times 800 \right)$	2,24,800
Cost of goods sold	33,15,800
Add: Administration overheads	4,72,000
Add: Selling & Distribution overheads (₹ 54 × 11,800)	6,37,200
Cost of Sales	44,25,000
Sales (11,800 × ₹ 416)	49,08,800
Profit	4,83,800

Q.7

PY Sep 24

MNP Limited have the capacity to produce 84,000 units of a product very month. Its prime cost per unit at various levels of production is as follows:

Level	Prime Cost per unit (₹)
10%	50
20%	48
30%	46
40%	44
50%	42
60%	40
70%	38
80%	36
90%	34
100%	32

Its prime cost consists of raw material consumed, direct wages and direct expenses in the ratio of 3 : 2 : 1. In the month of January 2024, the company worked at 40% capacity and raw material purchased amounting to ₹ 8,40,000. In the month of February 2024, the company worked at 100% capacity and raw material purchased for ₹ 16,46,400.

It is the policy of the company to maintain opening stock of raw material equal to 1/3 of closing stock of raw material. Factory overheads are recovered at 60% of direct wages cost. Fixed administration expenses (as part of production cost) and fixed selling and distribution expenses are ₹ 2,01,600 and ₹ 1,68,000 per month



respectively. During the month of January 2024 company sold 33,600 units @ ₹ 68.8 per unit. The variable distribution cost amounts to ₹ 1.5 per unit sold.

The management of the company chalks out a pl for the month of February 2024 to sell its whole output @ ₹ 61 per unit by incurring following further expenditure :

- Company sponsors a television programme on every Sunday at a cost of ₹ 26,250 per week. There are 4 Sundays in February 2024.
- Hi-tea programme every month for its potential customers at a cost of ₹ 1,05,000.
- Special gift item costing ₹ 105 on sale of a dozen units.
- Lucky draws scheme is introduced every month by giving the first prize of ₹ 1,00,000; second prize of ₹ 80,000; third prize of ₹ 40,000 and four consolation prizes of ₹ 8,000 each.

Note: (In the month of February 2024, there is a significant saving in material cost per unit due to entry of new suppliers in the market and saving in per unit cost of Direct wages and Direct expenses due to introduction of new policy by the management.)

Prepare a cost sheet for the month of January 2024 and February 2024 showing prime cost (with different elements of prime cost), factory cost, cost of production, total cost and profit earned.

Ans.

Cost Sheet

Particulars	January 2024	February 2024
	33,600 Units	84,000 Units
Opening Stock of Raw Material	50,400	1,51,200
Add: Purchases	8,40,000	16,46,400
Less: Closing stock of Raw Material	(1,51,200)	(4,53,600)
Direct materials consumed:	7,39,200	13,44,000
Direct Wages	4,92,800	8,96,000
Direct expenses	2,46,400	4,48,000
Prime Cost	14,78,400	26,88,000
Factory overheads (60% of direct wages)	2,95,680	5,37,600
Factory / Works Cost	17,74,080	32,25,600
Add: Administration overhead (Production)	2,01,600	2,01,600
Cost of Production / Cost of goods sold	19,75,680	34,27,200
Add: Fixed selling and distribution Overhead	1,68,000	1,68,000
Variable distribution overheads (₹ 1.5 per unit)	50,400	1,26,000
- Sponsorship cost	-	1,05,000
- Hi tea programme	-	1,05,000
- Special gifts (84,000 × 1/12 × 105)	-	7,35,000
- Lucky draw prize *	-	2,52,000
Cost of sales / Total Cost	21,94,080	49,18,200
Profit (Balancing figure)	1,17,600	2,05,800
Sales revenue	23,11,680	51,24,000

*Lucky draw prize:

	Amount (₹)
1 st Prize	1,00,000
2 nd Prize	80,000
3 rd Prize	40,000
Consolation Prizes (4 × ₹ 8,000)	32,000

Total	2,52,000
-------	----------

Working note :**Calculation of opening and costing stock of Raw Material January**

Units Manufactured = $84,000 \times 40\% = 33,600$ units
Prime Cost = $33,600 \times 44 = ₹ 14,78,400$
Raw Material consumed = $₹ 14,78,400 \times 3/6 = ₹ 7,39,200$
Raw Material purchase (given) = ₹ 8,40,000
Let closing stock of Raw Material be x
Opening stock of Raw Material be $1/3x$
Opening Stock + Purchase - closing stock = Raw Material consumed
 $1/3x + ₹ 8,40,000 - x = ₹ 7,39,200$
 $1/3x - x = ₹ 7,39,200 - ₹ 8,40,000$
 $2/3x = ₹ 1,00,800$
 $x = ₹ 1,51,200$ (closing stock)
Opening stock = $₹ 1,51,200 \times 1/3 = ₹ 50,400$

February

Prime Cost = $84,000 \times 32 = ₹ 26,88,000$
Raw Material consumed = $₹ 26,88,000 \times 3/6 = ₹ 13,44,000$
Raw Material purchased (given) = ₹ 16,46,400
Opening Stock + Purchase - closing stock = Raw Material consumed
 $₹ 1,51,200 + ₹ 16,46,400 - \text{closing stock} = ₹ 13,44,000$
Closing stock = ₹ 4,53,600

Q.8

MTP May25(2)



The following information is made available:

Opening stock of Work in progress	-	₹ 60,000
Opening Raw Materials	-	₹ 1,20,000
Opening Finished Goods	-	₹ 1,13,250
Purchase of Materials	-	₹ 7,50,000
Indirect manufacturing costs	-	40% of conversion costs
Sales Revenue	-	₹ 22,50,000
Direct Labour	-	₹ 6,66,750
Prime Costs	-	₹ 11,93,250
Gross margin	-	30% of revenue
Cost of goods available for sale	-	₹ 16,67,325

From the above DETERMINE the following:

- Closing Raw Materials
- Closing Work in progress
- Closing Finished Goods.

Ans.

Prime cost = 11,93,250
Direct Labour = 6,66,750
Direct Material consumed (Prime cost - Direct Labour) = 5,26,500
Opening Raw Material (RM) = 1,20,000



Purchase of RM = 7,50,000
Closing RM (Op RM + Purchases - Materials Consumed) = 3,43,500
 Sales 22,50,000
 Less: Gross profit @ 30% 6,75,000
 Cost of Sales 15,75,000
 Cost of goods available for sales 16,67,325
Hence Closing Finished goods (FG) 92,325 (16,67,325 - 15,75,000)
 Opening Finished goods 1,13,250
Cost of Production (Cost of Sales + Closing FG - Opening FG) = 15,54,075
 Conversion costs = Labour + Production Overhead
 Overhead = 40% and hence labour = 60%
 Hence total conversion cost = 6,66,750/60% = 11,11,250
 Hence POH (Total conversion - Labour cost) = 4,44,500
 Works Cost = 16,37,750
 Opening Work in progress (WIP) = 60,000
Closing Work in progress (Work Cost + Opening WIP - Closing WIP) = 1,43,675

Q.9

MTP Sep24(2)



ABC Ltd is engaged in producing electronic equipments. It has furnished following details related to its products produced during a month:

	Units	Amount (₹)
Opening stock	10,000	5,00,00,000
Purchases	4,90,000	25,20,00,000
Closing stock	17,500	85,00,000
Works-in-progress		
Opening	20,000	1,20,00,000
Closing	10,000	60,50,000
Direct employees' wages, allowances etc.		5,50,50,000
Primary packaging cost (per unit)		140
R&D expenses & Quality control expenses		1,90,00,000
Guards' salaries		20,00,000
Directors' salaries		60,00,000
Consumable stores, depreciation on plant related to factory overhead		3,42,00,000
Product inspection (before primary packaging)		22,00,000
Rearrangement design of factory machine		75,00,000
Administrative overheads related to production		3,45,00,000
Selling expenses		3,94,50,000
Royalty paid for production		3,10,50,000
Cost of web-site (for online sale) maintenance		60,75,000
Gifts & Snacks		30,50,000
GST (credit allowed)		5,50,00,000
AMC cost of CCTV		10,00,000
Hiring of cars for the transportation of employees and guests		25,00,000
Audit and Legal Fees		29,00,000
Secondary packaging cost (per unit)		20


Distribution of the following costs:

Guard's salaries to Factory, Office and Distribution in the ratio 7: 2:1.

Hiring of cars is only for selling and distribution

AMC of CCTV to Factory, Office and Selling in the ratio 6 : 2 : 2.

The company paid EPF of 12% over above basic pay. However, Guards will not receive any incentive or EPF.

 It has lucky draws every month giving the first prize of ₹ 1,00,000; 2nd prize of ₹ 50,000, 3rd prize of ₹ 20,000 and three consolation prizes of ₹ 10,000 each to customers buying the product.

It also sponsors a television programme every week at a cost of ₹ 20,00,000 per month.

The hiring of cars attracts GST under RCM @5% without credit.

There was a normal scrap of 2,000 units of direct material which realized ₹ 350 per unit. The entire finished product was sold at a profit margin of 25% on sales.

You are required to PREPARE a cost sheet

Ans.

Particulars	Units	Amount (₹)
Material		
Opening stock	10,000	5,00,00,000
Add: Purchases	4,90,000	25,20,00,000
Less: Closing stock	(17,500)	(85,00,000)
	4,82,500	29,35,00,000
Less: Normal wastage of materials realized @ ₹ 350 per unit	(2,000)	(7,00,000)
Material consumed		29,28,00,000
Direct employee's wages and allowances		5,50,50,000
Direct expenses- Royalty paid for production		3,10,50,000
Prime cost	4,80,500	37,89,00,000
Factory overheads - Consumable stores, depreciation etc.		3,42,00,000
Rearrangement design of factory machine		75,00,000
Gross Works Cost	4,80,500	38,64,00,000
Add: Opening WIP	20,000	1,20,00,000
Less: Closing WIP	(10,000)	(60,50,000)
Factory/Works Cost	4,90,500	39,23,50,000
Administration Overheads related to production		3,45,00,000
R&D expenses and Quality control cost		1,90,00,000
AMC cost of CCTV installed at factory premises		6,00,000
Guard Salaries for factory premises		14,00,000
Product Inspection		22,00,000
Add: Primary packaging cost @ ₹ 140 per unit		6,86,70,000
Cost of production Administration Overheads	4,90,500	51,87,20,000
Guard salaries for office		4,00,000
Audit and legal fees		29,00,000
Director's Salaries		60,00,000
EPF Director's Salaries @12%		7,20,000
AMC cost for CCTV installed at office.		2,00,000
Selling and Distribution Overheads		
Cost of maintaining website for online sale		60,75,000
Secondary packaging cost @ ₹ 20 per unit	4,90,500	98,10,000
Gift and snacks		30,50,000
Guard salaries for selling department		2,00,000
AMC cost for CCTV installed at selling department		2,00,000
Hiring charges of cars		25,00,000
Add: GST @5% on RCM basis		1,25,000
Television programme sponsorship cost		20,00,000



Customers' prize cost*		2,00,000
Selling expenses		3,94,50,000
Cost of sales		58,64,75,000
Add: Profit @ 25% on sales or 33.333% of cost		19,54,89,712
Sales value		78,19,64,712

*Customers' prize cost:

	Amount (₹)
1st Prize	1,00,000
2nd Prize	50,000
3rd Prize	20,000
Consolation Prizes (3 × ₹10,000)	30,000
Total	2,00,000

*Customers' prize cost:

	Amount (₹)
1st Prize	1,00,000
2nd Prize	50,000
3rd Prize	20,000
Consolation Prizes (3 × ₹10,000)	30,000
Total	2,00,000



2

 CHAPTER

MATERIAL COST

Q.10

ABC Analysis

MTP May 18



A store keeper has prepared the below list of items kept in the store of the factory.

Item	Units	Unit cost (₹)
A	12,000	30.00
B	18,000	3.00
C	6,000	35.00
D	750	220.00
E	3,800	75.00
F	400	105.00
G	600	300.00
H	300	350.00
I	3,000	250.00
J	20,000	7.50
K	11,500	27.50
L	2,100	75.00

The store keeper requires your help to classify the items for prioritization. You are required to APPLY ABC analysis to classify the store items as follows:

Store items which constitutes approx 70%, 20% and 10% of total value as A, B and C respectively.

Ans.

Statement of Total Cost and Ranking

Item	Units	% of Total units	Unit cost (₹)	Total cost (₹)	% of Total cost	Ranking
A	12,000	15.30%	30.00	3,60,000	12.97%	2
B	18,000	22.94%	3.00	54,000	1.95%	11
C	6,000	7.65%	35.00	2,10,000	7.57%	5
D	750	0.96%	220.00	1,65,000	5.95%	7
E	3,800	4.84%	75.00	2,85,000	10.27%	4
F	400	0.51%	105.00	42,000	1.51%	12
G	600	0.76%	300.00	1,80,000	6.49%	6
H	300	0.38%	350.00	1,05,000	3.78%	10
I	3,000	3.82%	250.00	7,50,000	27.03%	1
J	20,000	25.49%	7.50	1,50,000	5.41%	9
K	11,500	14.66%	27.50	3,16,250	11.40%	3
L	2,100	2.68%	75.00	1,57,500	5.68%	8
	78,450	100.00%		27,74,750	100.00%	



Q.11

All Formulas

RTP Nov 22



M/s Tanishka Materials Private Limited produces a product which names "ESS". The consumption of raw material for the production of "ESS" is 210 Kgs to 350 Kgs per week. Other information is as follows:

Procurement Time: 5 to 9 Days
 Purchase price of Raw Materials: ₹ 100 per kg
 Ordering Cost per Order: ₹ 200
 Storage Cost: 1% per month plus ₹ 2 per unit per annum
 Consider 365 days a year.

You are required to CALCULATE:

- Economic Order Quantity
- Re-Order Level (ROL)
- Maximum Stock Level
- Minimum Stock Level
- Average Stock Level
- Number of Orders to be placed per year
- Total Inventory Cost
- If the supplier is willing to offer 1% discount on purchase of total annual quantity in two orders, whether offer is acceptable?
- If the answer is no, what should be the counteroffer w.r.t. percentage of discount?

Ans.

As procurement time is given in days, consumption should also be calculated in days:

Maximum Consumption per Day: $\frac{350}{7} = 50$ Kgs

Minimum Consumption per Day: $\frac{210}{7} = 30$ Kgs.

Average Consumption per Day: $\frac{(50 + 30)}{2} = 40$ Kgs

(a) Calculation of Economic Order Quantity (EOQ)

Annual consumption of Raw Materials (A): 40 Kgs × 365 days = 14,600 Kgs

Storage or Carrying Cost per unit per annum (C): (₹ 100 × 1% × 12 months) + ₹ 2 = ₹ 14

Ordering Cost (O): ₹ 200 per Order

$$\begin{aligned} \text{EOQ} &= \sqrt{\frac{2 \times A \times O}{C}} \\ &= \sqrt{\frac{2 \times 14600 \times 200}{14}} = 646 \text{ Kgs.} \end{aligned}$$

$$\begin{aligned} \text{(b) Re-Order Level (ROL)} &= (\text{Maximum consumption Rate} \times \text{Maximum Procurement Time}) \\ &= 50 \text{ kgs per day} \times 9 \text{ days} \\ &= 450 \text{ kgs} \end{aligned}$$

$$\begin{aligned} \text{(c) Maximum Stock Level} &= \text{Recorder Level} + \text{Recorder Quantity} - (\text{Minimum Consumption Rate} \times \text{Minimum Procurement Time}) \\ &= 450 \text{ kgs} + 646 \text{ kgs} - (30 \text{ kgs} \times 5 \text{ days}) \\ &= 946 \text{ kgs} \end{aligned}$$

$$\begin{aligned} \text{(d) Minimum Stock Level} &= \text{Recorder Level} - (\text{Average consumption Rate} \times \text{Average Procurement Time}) \\ &= 450 \text{ kgs} - (40 \text{ kgs} \times 7 \text{ days}) \end{aligned}$$

- = 170 kgs
- (e) **Average Stock Level** = $\frac{\text{Maximum Stock Level} + \text{Minimum Stock Level}}{2}$
- = $\frac{946 \text{ kgs} + 170 \text{ kgs}}{2}$
- = 558 kgs
- (f) **Number of Orders to be placed per year**
- = $\frac{\text{Annual Consumption of Raw Materials}}{\text{EOQ}}$
- = $\frac{14600 \text{ kg}}{646 \text{ kgs}}$
- = 22.60 Orders or 23 Orders
- (g) **Total Inventory Cost**
- | | | |
|--|----------------------|--|
| Cost of Materials (A × Purchase Price) (14600 kgs × ₹ 100) | = ₹14,60,000 | |
| Total Ordering Cost (No. of Orders × O) (23 Orders × 200) | = ₹ 4,600 | |
| Total Carrying Cost (EOQ / 2 × C) (646 kgs / 2 × ₹ 14) | = ₹ 4,522 | |
| Total Inventory Cost | = ₹ 14,69,122 | |
- (h) If the supplier is willing to offer 1% discount on purchase of total annual quantity in two orders:
- | | | |
|---|----------------------|--------|
| Offer Price | = ₹ 100 × 99% | = ₹ 99 |
| Revised Carrying Cost = (₹ 99 × 1% × 12 months) + ₹ 2 | = ₹ 13.88 | |
| Revised Order Quantity = 14600 kgs / 2 Orders | = 7300 kgs | |
| Total Inventory Cost at Offer Price | | |
| Cost of Materials (A × Purchase Price) (14600 kgs × ₹ 99) | = ₹14,45,400 | |
| Total Ordering Cost (No. of Orders × O) (2 Orders × 200) | = ₹ 400 | |
| Total Carrying Cost (EOQ / 2 × C) (7300 kgs / 2 × ₹13.88) | = ₹ 50,662 | |
| Total Inventory Cost | = ₹ 14,96,462 | |
- Advice: As total inventory cost at offer price is ₹ 27,340 (14,96,462 - 14,69,122) higher, offer should not be accepted.
- (i) **Counter-offer:**
- Let Discount Rate = z%
- | | | |
|---|---|--|
| Counter-Offer Price | = ₹ 100 - z% = ₹ 100 - z | |
| Revised Carrying Cost | = [(₹ 100 - z) × 1% × 12 months] + ₹ 2 = ₹ 12 - 0.12z + ₹ 2 | |
| | = ₹ 14 - 0.12z | |
| Total Inventory Cost at Counter-Offer Price | | |
| Cost of Materials (A × Purchase Price) [14600 kgs × (₹ 100 - z)] | = ₹ 14,60,000 - 14,600z | |
| Total Ordering Cost (No. of Orders × O) (2 Orders × 200) | = ₹ 400 | |
| Total Carrying Cost (EOQ / 2 × C) [7300 kgs / 2 × (₹ 14 - 0.12z)] | = ₹ 51,100 - 438z | |
| Total Inventory Cost | = ₹ 15,11,500 - 15038z | |
| | ₹ 14,69,122 = ₹ 15,11,500 - 15038z | |
- Or 15038z = 42,378
- Or z = 2.82
- Therefore, discount should be at least 2.82% in offer price.

Q.12

Economic Order Qty (EOQ)

MTP Nov 19



A Ltd. manufactures a product X which requires two raw materials A and B in a ratio of 1:4.



The sales department has estimated a demand of 5,00,000 units for the product for the year. To produce one unit of finished product, 4 units of material A is required.

Stock position at the beginning of the year is as below:

Product- X 12,000 units

Material A 24,000 units

Material B 52,000 units

To place an order the company has to spend Rs.15,000. The company is financing its working capital using a bank cash credit @13% p.a.

Product X is sold at Rs.1,040 per unit. Material A and B are purchased at Rs.150 and Rs.200 respectively.

Required:

COMPUTE economic order quantity (EOQ):

(i) If purchase order for the both materials is placed separately.

(ii) If purchase order for the both materials is not placed separately.

Ans.

Workings:

$$\begin{aligned}\text{Annual production of Product X} &= \text{Annual demand} - \text{Opening stock} \\ &= 5,00,000 - 12,000 = 4,88,000 \text{ units}\end{aligned}$$

Annual requirement for raw materials = Annual production × Material per unit - Opening stock of material

$$\text{Material A} = 4,88,000 \times 4 \text{ units} - 24,000 \text{ units} = 19,28,000 \text{ units}$$

$$\text{Material B} = 4,88,000 \times 16 \text{ units} - 52,000 \text{ units} = 77,56,000 \text{ units}$$

(i) **Computation of EOQ when purchase order for the both materials is placed separately**

$$\text{EOQ} = \sqrt{\frac{2 \times \text{Annual Requirement for material} \times \text{Ordering cost}}{\text{Carrying cost per unit per annum}}}$$

$$\text{Material A} = \sqrt{\frac{2 \times 19,28,000 \text{ units} \times \text{Rs.15,000}}{\text{Rs.15,000}}} = \sqrt{\frac{38,56,000 \times \text{Rs.15,000}}{\text{Rs.19.5}}}$$

$$\begin{aligned}&13\% \text{ of Rs.150} \\ &= 54,462 \text{ units}\end{aligned}$$

$$\text{Material B} = \sqrt{\frac{2 \times 77,56,000 \text{ units} \times \text{Rs.15,000}}{\text{Rs.15,000}}} = \sqrt{\frac{1,55,12,000 \times \text{Rs.15,000}}{\text{Rs.26}}}$$

$$\begin{aligned}&13\% \text{ of Rs.200} \\ &= 94,600 \text{ units}\end{aligned}$$

(ii) **Computation of EOQ when purchase order for the both materials is not placed separately**

$$\begin{aligned}\text{Material A \& B} &= \sqrt{\frac{2 \times (19,28,000 + 77,56,000) \text{ units} \times \text{Rs.15,000}}{13\% \text{ of Rs.190}^*}} \\ &= \sqrt{\frac{1,93,68,000 \times \text{Rs.15,000}}{\text{Rs.24.7}}} = 1,08,452 \text{ units}\end{aligned}$$

$$\text{Material A} = \frac{1,08,452 \times 19,28,000}{96,84,000} = 21,592 \text{ units}$$

$$\text{Material A} = \frac{1,08,452 \times 77,56,000}{96,84,000} = 86,860 \text{ units}$$

$$^* \frac{(\text{Rs.150} \times 19,28,000) + (\text{Rs.200} \times 77,56,000)}{(19,28,000 + 77,56,000)} = \text{Rs.190}$$

Q.13

Economic Order Qty (EOQ)

RTP Nov 19



HBL Limited produces product 'M' which has a quarterly demand of 20,000 units. Each product requires 3 kg. and 4 kg. of material X and Y respectively. Material X is supplied by a local supplier and can be procured at factory

stores at any time, hence, no need to keep inventory for material X. The material Y is not locally available, it requires to be purchased from other states in a specially designed truck container with a capacity of 10 tons. The cost and other information related with the materials are as follows:

Particulars	Material -X	Material-Y
Purchase price per kg. (excluding GST)	₹140	₹640
Rate of GST	18%	18%
Freight per trip (fixed, irrespective of quantity)	-	₹28,000
Loss of materials in transit*	-	2%
Loss in process*	4%	5%

On purchased quantity

Other information:

The company has to pay 15% p.a. to bank for cash credit facility.

Input credit is available on GST paid on materials.

Required:

- CALCULATE cost per kg. of material X and Y
- CALCULATE the Economic Order quantity for both the materials.

Ans.

Working Notes:

Annual purchase quantity for material X and Y:

Annual demand for product M- 20,000 units × 4 = 80,000 units

Particulars	Mat-X	Mat-Y
Quantity required for per unit of product M	3 kg.	4 kg.
Net quantity for materials required	2,40,000 kg.	3,20,000 kg.
Add: Loss in transit	-	6,881 kg.
Add: Loss in process	10,000 kg.	17,204 kg.
Purchase quantity	2,50,000 kg.	3,44,085 kg.

Note - Input credit on GST paid is available; hence, it will not be included in cost of material.

- Calculation of cost per kg. of material X and Y:**

Particulars	Mat-X	Mat-Y
Purchase quantity	2,50,000 kg.	3,44,085 kg.
Rate per kg.	₹140	₹640
Purchase price	₹3,50,00,000	₹22,02,14,400
Add: Freight	0	₹9,80,000*
Total cost	₹3,50,00,000	₹22,11,94,400
Net Quantity	2,40,000 kg.	3,20,000 kg.
Cost per kg.	₹145.83	₹691.23

$$* \text{No. of trucks} = \frac{3,44,085 \text{ kg.}}{10 \text{ ton} \times 1,000} = 34.40 \text{ trucks or } 35 \text{ trucks}$$

$$\text{Therefore, total freight} = 35 \text{ trucks} \times ₹28,000 = ₹9,80,000$$

- Calculation of Economic Order Quantity (EOQ) for Mat.-X and Y:**

$$EOQ = \sqrt{\frac{2 \times \text{Annual Requirement} \times \text{Order cost}}{\text{Carrying cost per unit p.a.}}}$$

Particulars	Mat-X	Mat-Y
Annual Requirement	2,50,000 kg.	3,44,085 kg.
Ordering cost	0	₹28,000
Cost per unit	₹145.83	₹691.23
Carrying cost	15%	15%
Carrying cost per unit p.a.	0*	₹103.68
EOQ	0	13,632.62 kg.

Q.14

EOQ / Max. Stock Level

MTP Nov 22(1)



A company produces a product 'AB' by using two raw materials - 'Material Ae' and 'Material Be' in the ratio of 5:3.

A sales volume of 50,000 kgs is estimated for the month of December by the managers expecting the trend will continue for entire year. The ratio of input and output is 8:5.

Other Information about Raw Material Ae is as follows:

Purchase Price ₹ 150 per kg

Re-order period 2 to 3 days

Carrying Cost 12%

Note: Material Ae is perishable in nature and if not used within 3.5 days of purchase it becomes obsolete.

To place an order for material 'Ae', the company has to incur an administrative cost of ₹ 375 per order.

At present, material 'Ae' is purchased in a lot of 7,500 kgs. to avail the discount on purchase. Company works for 25 days in a month and production is carried out evenly. Calculate (i) EOQ and (ii) Maximum Stock Level

Ans.

- (i) Monthly production of AB = 50,000 kgs
 Raw material required = $50,000/5 \times 8 = 80,000$ kgs
 Material Ae and Material Be ratio = 5:3
 Therefore, material Ae = $80,000/8 \times 5 = 50,000$ kgs

$$\text{Calculation of EOQ} = \sqrt{\frac{2 \times (\text{Annual demand} \times \text{cost per order})}{\text{Annual holding cost per unit}}}$$

$$EOQ = \sqrt{\frac{2 \times 50,000 \text{ kgs} \times 12 \times 375}{12\% \text{ of } 150}} = 5,000 \text{ kgs}$$

- (ii) Calculation of maximum stock level of Material Ae which is perishable in nature and is required to be used within 3.5 days.

(a) Stock equals to 3.5 days consumption = $50,000 \text{ kgs} / 25 \text{ days} \times 3.5 \text{ days} = 7,000 \text{ kgs}$

(b) Maximum stock level for Material Ae

Maximum stock = Reorder quantity + reorder level - (minimum consumption × minimum lead time)

Where, reorder quantity = 7,500 kgs

Reorder level = maximum consumption* × maximum lead time

= $50,000 / 25 \times 3 \text{ days} = 6,000 \text{ kgs}$

Now, Maximum stock level = $7,500 \text{ kgs} + 6,000 \text{ kgs} - (50,000 / 25 \text{ days} \times 2 \text{ days}) = 9,500 \text{ kgs}$

Stock required for 3.5 days consumption is lower than the maximum stock level calculated above. Therefore, maximum stock level will be 7,000 kgs.
 (*since production is processed evenly throughout the month hence material consumption will also be even.)

Q.15

Min, Max, Avg Stock / Reorder

RTP Nov 20



A company uses four raw materials A, B, C and D for a particular product for which the following data apply :-

Raw Material	Usage per unit of product (Kg.)	Re-order Quantity (Kg.)	Price per Kg. (₹)	Delivery period (in weeks)			Re- order level (Kg.)	Minimum level (Kg.)
				Minimum	Average	Maximum		
A	12	12,000	12	2	3	4	60,000	?
B	8	8,000	22	5	6	7	70,000	?
C	6	10,000	18	3	5	7	?	25,500
D	5	9,000	20	1	2	3	?	?

Weekly production varies from 550 to 1,250 units, averaging 900 units of the said product. What would be the following quantities:-

- (i) Minimum Stock of A?
- (ii) Maximum Stock of B?
- (iii) Re-order level of C?
- (i) Average stock level of A?
- (ii) Re-order level of D?
- (iii) Minimum Stock level of D?

Ans.

- (i) **Minimum stock of A**

Re-order level - (Average consumption × Average time required to obtain delivery)
 = 60,000 kg. - (900 units × 12 kg. × 3 weeks) = 27,600 kg.

- (ii) **Maximum stock of B**

Re-order level + Re-order quantity- (Min. Consumption × Min. Re-order period)
 = 70,000 kg.+ 8,000 kg- (550 units × 8 kg. × 5 weeks).
 = 78,000 - 22,000 = 56,000 kg.

- (iii) **Re-order level of C**

Maximum re-order period × Maximum Usage
 = 7 weeks × (1,250 units × 6 kg.) = 52,500 kg.

OR

= Minimum stock of C + (Average consumption × Average delivery time)
 = 25,500 kg.+ [(900 units × 6 kg.) × 5 weeks] = 52,500 kg.

- (iv) **Average stock level of A**

$$= \frac{\text{Minimum stock} + \text{Maximum stock}}{2} = (\text{Refer to Working Note})$$

$$= \frac{27,600 + 58,800}{2} = 43,200 \text{ kg.}$$

Working note

Maximum stock of A = ROL + ROQ - (Minimum consumption × Minimum re-order period)
 = 60,000 kg. + 12,000 kg. - [(550 units × 12 kg.) × 2 weeks] = 58,800 kg.

- (v) **Re-order level of D**



Maximum re-order period × Maximum Usage
 3 weeks × (1,250 units × 5 kg.) = 18,750 kg

(vi) Minimum stock of D

Re-order level - (Average consumption × Average time required to obtain delivery)
 = 18,750 kg. - (900 units × 5 kg. × 2 weeks) = 9,750 kg.

Q.16

Min, Max, Avg Stock / Reorder

RTP May 20



Annav Electronics manufactures electronic home appliances. It follows weighted average Cost method for inventory valuation. Following are the data of component X:

Date	Particulars	Units	Rate per unit(₹)
15-12-19	Purchase Order- 008	10,000	9,930
30-12-19	Purchase Order- 009	10,000	9,780
01-01-20	Opening stock	3,500	9,810
05-01-20	GRN*-008 (against the Purchase Order- 008)	10,000	-
05-01-20	MRN**-003 (against the Purchase Order- 008)	500	-
06-01-20	Material Requisition-011	3,000	-
07-01-20	Purchase Order- 010	10,000	9,750
10-01-20	Material Requisition-012	4,500	-
12-01-20	GRN-009 (against the Purchase Order- 009)	10,000	-
12-01-20	MRN-004 (against the Purchase Order- 009)	400	-
15-01-20	Material Requisition-013	2,200	-
24-01-20	Material Requisition-014	1,500	-
25-01-20	GRN-010 (against the Purchase Order- 010)	10,000	-
28-01-20	Material Requisition-015	4,000	-
31-01-20	Material Requisition-016	3,200	-

*GRN- Goods Received Note; **MRN- Material Returned Note

Based on the above data, you are required to CALCULATE:

- Re-order level
- Maximum stock level
- Minimum stock level
- PREPARE Store Ledger for the period January 2020 and DETERMINE the value of stock as on 31-01-2020.
- Value of components used during the month of January, 2020.
- Inventory turnover ratio.

Ans.**Workings:**

Consumption is calculated on the basis of material requisitions:

Maximum component usage = 4,500 units (Material requisition on 10-01-20)

Minimum component usage = 1,500 units (Material requisition on 24 -01-20)

Lead time is calculated from purchase order date to material received date

Maximum lead time = 21 days (15-12-2019 to 05-01-2020)

Minimum lead time = 14 days (30-12-2019 to 12-01-2020)

Calculations:

- Re-order level
 = Maximum usage × Maximum lead time
 = 4,500 units × 21 days = 94,500 units
- Maximum stock level
 = Re-order level + Re-order Quantity - (Min. Usage × Min. lead time)

- = 94,500 units + 10,000 units - (1,500 units × 14 days)
 = 1,04,500 units - 21,000 units = 83,500 units
 (iii) Minimum stock level
 = Re-order level - (Avg. consumption × Avg. lead time)
 = 94,500 units - (3,000 units × 17.5 days)
 = 94,500 units - 52,500 units
 = 42,000 units

- (i) Store Ledger for the month of January 2020:

Date	Receipts				Issue				Balance		
	GRN/ MRN	Units	Rate ₹	Amt. (₹ '000)	MRN/ MR	Units	Rate ₹	Amt. (₹ '000)	Units	Rate ₹	Amt. (₹ '000)
01-01-20	-	-	-	-	-	-	-	-	3,500	9,810	34,335
05-01-20	008	10,000	9,930	99,300	003	500	9,930	4,965	13,000	9,898	1,28,670
06-01-20	-	-	-	-	011	3,000	9,898	29,694	10,000	9,898	98,980
10-01-20	-	-	-	-	012	4,500	9,898	44,541	5,500	9,898	54,439
12-01-20	009	10,000	9,780	97,800	004	400	9,780	3,912	15,100	9,823	1,48,327
15-01-20	-	-	-	-	013	2,200	9,823	21,611	12,900	9,823	1,26,716
24-01-20	-	-	-	-	014	1,500	9,823	14,734	11,400	9,823	1,11,982
25-01-20	010	10,000	9,750	97,500	-	-	-	-	21,400	9,789	2,09,482
28-01-20	-	-	-	-	015	4,000	9,789	39,156	17,400	9,789	1,70,326
31-01-20	-	-	-	-	016	3,200	9,789	31,325	14,200	9,789	1,39,001

[Note: Decimal figures may be rounded-off to the nearest rupee value wherever required]

Value of stock as on 31-01-2020 ('000) = ₹1,39,001

- (v) Value of components used during the month of January 2020:
 Sum of material requisitions 011 to 016 ('000)
 = ₹ 29,694 + ₹ 44,541 + ₹ 21,611 + ₹ 14,734 + ₹ 39,156 + ₹ 31,325 = ₹ 1,81,061
- (vi) Inventory Turnover Ratio

$$= \frac{\text{Value of materials used}}{\text{Average stock value}} = \frac{1,81,061}{(1,39,001 + 34,335) / 2} = \frac{1,81,061}{86,668} = 2.09$$

Q.17

Total Cost / EOQ / Reorder

MTP Dec 21(2)



The yearly production of a company's product which has a steady market is 40,000 units. Each unit of a product requires 1 kg. of raw material. The cost of placing one order for raw material is ₹ 1,000 and the inventory carrying cost is ₹ 20 per annum. The lead time for procurement of raw material is 36 days and a safety stock of 1,000 kg. of raw materials is maintained by the company. The company has been able to negotiate the following discount structure with the raw material supplier

Order quantity (kg.)	Discount (₹) Upto 6,000
6,001 - 8,000	4,000
8,001 - 16,000	20,000
16,001 - 30,000	32,000
30,001 - 45,000	4,0000

You are REQUIRED to:

- Calculate the re-order point considering 30 days in a month.
- Prepare a statement showing the total cost of procurement and storage of raw material after considering the discount of the company elects to place one, two, four or five orders in the year.
- State the number of orders which the company should place to minimize the costs after taking EOQ also into consideration.



Ans.

Working notes

1. Annual production = 40,000 units
2. Raw material required for 40,000 units (40,000 units × 1 kg.) = 40,000 kg.
3. $EOQ = \sqrt{\frac{2 \times 40,000 \text{ kgs.} \times 1,000}{20}} = 20,000 \text{ kgs}$
4. Total cost of procurement and storage when the order size is equal to EOQ or 2,000 kg.
 No. of orders (40,000 kg. ÷ 2,000 kg.) = 20 times
 Ordering cost (20 orders × ₹1,000) = ₹ 20,000
 Carrying cost (₹) ($\frac{1}{2} \times 2,000 \text{ kg.} \times ₹ 20$) = ₹ 20,000
 Total cost = ₹ 40,000
- (i) **Re-order point** = Safety stock + Lead time consumption
 = 1,000 kg. + $\frac{40,000 \text{ kg.}}{360 \text{ days}} \times 360 \text{ days}$
 = 1,000 kg. + 4,000 kg. = 5,000 kg.
- (ii) **Statement showing the total cost of procurement and storage of raw materials (after considering the discount)**

Order size	No. of orders	Total cost of procurement	Average stock	Total cost of storage of raw materials	Discount	Total cost
Kg.		(₹)	Kg.	(₹)	(₹)	(₹)
(1)	(2)	(3)=(2)×₹1,000	(4)= $\frac{1}{2} \times (1)$	(5)=(4)×₹20	(6)	(7)=[(3)+(5)- (6)]
40,000	1	1,000	20,000	4,00,000	40,000	3,61,000
20,000	2	2,000	10,000	2,00,000	32,000	1,70,000
10,000	4	4,000	5,000	1,00,000	20,000	84,000
8,000	5	5,000	4,000	80,000	4,000	81,000

- (ii) Number of orders which the company should place to minimize the costs after taking EOQ also into consideration is 20 orders each of size 2,000 kg. The total cost of procurement and storage in this case comes to ₹ 40,000, which is minimum.

3

CHAPTER

EMPLOYEE COST

Q.18

Calculates wages & allocate

RTP Nov 20



GZ Ld. pays the following to a skilled worker engaged in production works. The following are the employee benefits paid to the employee:

(a)	Basic salary per day	1,000
(b)	Dearness allowance (DA)	20% of basic salary
(c)	House rent allowance	16% of basic salary
(d)	Transport allowance	50 per day of actual work
(e)	Overtime	Twice the hourly rate (considers basic and DA), only if works more than 9 hours a day otherwise no overtime allowance. If works for more than 9 hours a day then overtime is considered after 8th hours.
(f)	Work of holiday and Sunday	Double of per day basic rate provided works atleast 4 hours. The holiday and Sunday basic is eligible for all allowances and statutory deductions.
(g)	Earned leave & Casual leave	These are paid leave.
(h)	Employer's contribution to Provident fund	12% of basic and DA
(i)	Employer's contribution to Pension fund	7% of basic and DA

The company normally works 8-hour a day and 26-day in a month. The company provides 30 minutes lunch break in between.

During the month of August 2020, Mr. Z works for 23 days including 15th August and a Sunday and applied for 3 days of casual leave. On 15th August and Sunday he worked for 5 and 6 hours respectively without lunch break. On 5th and 13th August he worked for 10 and 9 hours respectively.

During the month Mr. Z worked for 100 hours on Job no.HT200.

You are required to CALCULATE:

- Earnings per day
- Effective wages rate per hour of Mr. Z.
- Wages to be charged to Job no.HT200.

Ans.
Workings:

- Normal working hours in a month = (Daily working hours - lunch break) × no. of days
 = (8 hours - 0.5 hours) × 26 days = 195 hours
- Hours worked by Mr. Z = No. of normal days worked + Overtime + holiday/ Sunday worked
 = (21 days × 7.5 hours) + (9.5 hours + 8.5 hours) + (5 hours + 6 hours)
 = 157.5 hours + 18 hours + 11 hours = 186.50 hours.

(i) Calculation of earnings per day

Particulars	Amount (₹)
Basic salary (₹1,000 × 26 days)	26,000
Dearness allowance (20% of basic salary)	5,200
	31,200
House rent allowance (16% of basic salary)	4,160
Employer's contribution to Provident fund (12% × 31,200)	3,744
Employer's contribution to Pension fund (7% × 31,200)	2,184



	41,288
No. of working days in a month (days)	26
Rate per day	1,588
Transport allowance per day	50
Earnings per day	1,638

(ii) Calculation of effective wage rate per hour of Mr. Z:

Particulars	Amount (₹)
Basic salary (₹1,000 × 26 days)	26,000
Additional basic salary for Sunday & holiday (₹1,000 × 2 days)	2,000
Dearness allowance (20% of basic salary)	5,600
	33,600
House rent allowance (16% of basic salary)	4,480
Transport allowance (50 × 23 days)	1,150
Overtime allowance (160 × 2 × 2 hours)*	640
Employer's contribution to Provident fund (12% × 33,600)	4,032
Employer's contribution to Pension fund (7% × 33,600)	2,352
Total monthly wages	46,254
Hours worked by Mr. Z (hours)	186.5
Effective wage rate per hour	248

*(Daily Basic + DA) ÷ 7.5 hours

= (1,000+200) ÷ 7.5 = ₹160 per hour

(iii) Calculation of wages to be charged to Job no. HT200

= 248 × 100 hours = 24,800

Q.19

Gurenteed/Rowan/Piece Rate

RTP May 19



A Company is undecided as to what kind of wage scheme should be introduced. The following particulars have been compiled in respect of three workers. Which are under consideration of the management.

	I	II	III
Actual hours worked	380	100	540
Hourly rate of wages (in ₹)	40	50	60
Productions in units:			
- Product A	210	-	600
- Product B	360	-	1350
- Product C	460	250	-
Standard time allowed per unit of each product is:			
	A	B	C
Minutes	15	20	30

For the purpose of piece rate, each minute is valued at 1/-

You are required to CALCULATE the wages of each worker under:

- Guaranteed hourly rate basis
- Piece work earning basis, but guaranteed at 75% of basic pay (Guaranteed hourly rate if his earnings are less than 50% of basic pay.)
- Premium bonus basis where the worker received bonus based on Rowan scheme.

Ans.

- (i) Computation of wages of each worker under guaranteed hourly rate basis

Worker	Actual hours worked (Hours)	Hourly wage rate (₹)	Wages (₹)
I	380	40	15,200
II	100	50	5,000
III	540	60	32,400

- (ii) Computation of Wages of each worker under piece work earning basis

Product	Piece rate per unit (₹)	Worker-I		Worker-II		Worker-III	
		Units	Wages (₹)	Units	Wages (₹)	Units	Wages (₹)
A	15	210	3,150	-	-	600	9,000
B	20	360	7,200	-	-	1,350	27,000
C	30	460	13,800	250	7,500	-	-
Total			24,150		7,500		36,000

Since each worker's earnings are more than 50% of basic pay. Therefore, worker-I, II and III will be paid the wages as computed i.e. ₹ 24,150, ₹ 7,500 and ₹ 36,000 respectively.

Working Notes:

1. Piece rate per unit

Product	Standard time per unit in minute	Piece rate each minute (₹)	Piece rate per unit (₹)
A	15	1	15
B	20	1	20
C	30	1	30

1. Time allowed to each worker

Worker	Product-A	Product-B	Product-C	Total Time (Hours)
I	210 units × 15 = 3,150	360 units × 20 = 7,200	460 units × 30 = 13,800	24,150/60 = 402.50
II	-	-	250 units × 30 = 7,500	7,500/60 = 125
III	600 units × 15 = 9,000	1,350 units × 20 = 27,000	-	36,000/60 = 600

- (iii) Computation of wages of each worker under Premium bonus basis (where each worker receives bonus based on Rowan Scheme)

Worker	Time Allowed (Hr.)	Time Taken (Hr.)	Time saved (Hr.)	Wage Rate per hour (₹)	Earnings (₹)	Bonus (₹)*	Total Earning (₹)
I	402.5	380	22.5	40	15,200	850	16,050
II	125	100	25	50	5,000	1,000	6,000
III	600	540	60	60	32,400	3,240	35,640

$$* \frac{\text{Time Taken}}{\text{Time Allowed}} \times \text{Time Saved} \times \text{Wage Rate}$$

$$\text{Worker - I} = \frac{380}{402.5} \times 22.5 \times 40 = 850$$



$$\text{Worker - II} = \frac{100}{125} = 25 \times 50 = 1000$$

$$\text{Worker - III} = \frac{540}{600} = 60 \times 60 = 3240$$

Q.20 Halsey & Rowan

MTP May 18



Two workers 'A' and 'B' produce the same product using the same material. Their normal wage rate is also the same. 'A' is paid bonus according to Rowan scheme while 'B' is paid bonus according to Halsey scheme. The time allowed to make the product is 120 hours. 'A' takes 90 hours while 'B' takes 100 hours to complete the product. The factory overhead rate is ₹ 50 per hour actually worked. The factory cost of product manufactured by 'A' is ₹ 80,200 and for product manufactured by 'B' is ₹ 79,400.

Required:

- COMPUTE the normal rate of wages.
- CALCULATE the material cost.
- PREPARE a statement comparing the factory cost of the product as made by two workers.

Ans.

Let x be the cost of material and y be the normal rate of wage/hour

	Worker A (₹)	Worker B (₹)
Material cost	x	x
Labour wages	90 y	100 y
Bonus	Rowan system Time saved × hour worked × rate Time allowed	Halsey system Hours saved × 50% × rate
	$\frac{30}{120} \times 90 \times y = 22.5y$	$20 \times \frac{1}{2} \times y = 10y$
Overheads	$90 \times 50 = 4,500$	$100 \times 50 = 5,000$
Factory cost	$x + 112.5y + 4,500 = 80,200$ $\therefore x + 112.5y = 75,700 \dots (1)$	$x + 110y + 5,000 = 79,400$ $\therefore x + 110y = 74,400 \dots (2)$

Solving (1) and (2) we get x = 17,200 and y = 520

- Normal rate of wages is 520 per hour.
- Cost of materials = ₹ 17,200.
- Comparative Statement of factory cost

	Worker A (₹)	Worker B (₹)
Material cost	17,200	17,200
Wages	46,800 (90 × 520)	52,000 (100 × 520)
Bonus	11,700 $\left(\frac{30}{120} \times 90 \times 520 \right)$	5,200 $\left(20 \times \frac{1}{2} \times 520 \right)$
Overheads	4,500 (90 × 50)	5,000 (100 × 50)
Factory cost	80,200	79,400

Q.21

Halsey & Rowan

RTP Nov 19



ADV Pvt. Ltd. manufactures a product which requires skill and precision in work to get quality products. The company has been experiencing high labour cost due to slow speed of work. The management of the company wants to reduce the labour cost but without compromising with the quality of work. It wants to introduce a bonus scheme but is indifferent between the Halsey and Rowan scheme of bonus.

For the month of November 2019, the company budgeted for 24,960 hours of work. The workers are paid ₹80 per hour.

Required:

- (i) CALCULATE and suggest the bonus scheme where the time taken (in %) to time allowed to complete the works is (a) 100% (b) 75% (c) 50% & (d) 25% of budgeted hours.

Ans.

The Cost of labour under the bonus schemes are tabulated as below:

Time Allowed	Time taken	Wages (₹)	Bonus (₹)		Total Wages (₹)		Earning per hour (₹)	
			Halsey*	Rowan**	Halsey	Rowan	Halsey	Rowan
(1)	(2)	(3) = (2) × ₹ 80	(4)	(5)	(6) = (3) + (4)	(7) = (3) + (5)	(8) = (6)/(2)	(9) = (7)/(2)
24,960	24,960	19,96,800	-	-	19,96,800	19,96,800	80.00	80.00
24,960	18,720	14,97,600	2,49,600	3,74,400	17,47,200	18,72,000	93.33	100.00
24,960	12,480	9,98,400	4,99,200	4,99,200	14,97,600	14,97,600	120.00	120.00
24,960	6,240	4,99,200	7,48,800	3,74,400	12,48,000	8,73,600	200.00	140.00

* Bonus under Halsey Plan = 50% of (Time Allowed - Time Taken) × Rate per hour

** Bonus under Rowan Plan = $\frac{\text{Time Allowed}}{\text{Time Taken}} \times \text{Time saved} \times \text{Rate per hour}$

Rowan scheme of bonus keeps checks on speed of work as the rate of incentive increases only upto 50% of time taken to time allowed but the rate decreases as the time taken to time allowed comes below 50%. It provides incentives for efficient workers for savings in time but also puts check on careless speed. On implementation of Rowan scheme, the management of ADV Pvt. Ltd. would resolve issue of the slow speed work while maintaining the skill and precision required maintaining the quality of product.

Q.22

Halsey & Rowan (Important)

RTP July 21



JBL Sisters operates a boutique which works for various fashion houses and retail stores. It has employed 26 workers and pays them on time rate basis. On an average an employee is allowed 8 hours for boutique work on a piece of garment. In the month of December 2020, two workers M and J were given 15 pieces and 21 pieces of garments respectively for boutique work. The following are the details of their work:

	M	J
Work assigned	15 pcs.	21 pcs.
Time taken	100 hours	140 hours

Workers are paid bonus as per Halsey System. The existing rate of wages is 60 per hour. As per the new wages agreement the workers will be paid 72 per hour w.e.f. 1st January

2021. At the end of the month December 2020, the accountant of the company has wrongly calculated wages to these two workers taking 72 per hour.

Required:

- CALCULATE the loss incurred due to incorrect rate selection.
- CALCULATE the loss incurred due to incorrect rate selection, had Rowan scheme of bonus payment followed.
- CALCULATE the loss/ savings if Rowan scheme of bonus payment had followed.
- DISCUSS the suitability of Rowan scheme of bonus payment for JBL Sisters?



Ans.

Workings Notes:

Calculation of Total hours saved:

	M	J
No. of garments assigned (Pieces.)	15	21
Hour allowed per piece (Hours)	8	8
Total hours allowed (Hours)	120	168
Hours Taken (Hours)	100	140
Hours Saved (Hours)	20	28

(i) Calculation of loss incurred due to incorrect rate selection:

(While calculating loss only excess rate per hour has been taken)

	M(₹)	J(₹)	Total(₹)
Basic Wages	1,200 (100 Hrs. × ₹12)	1,680 (140 Hrs. × ₹12)	2,880
Bonus (as per Halsey Scheme)	120 (50% of 20 Hrs. × ₹12)	168 (50% of 28 Hrs. × ₹12)	288
Excess Wages Paid	1,320	1,848	3,168

(ii) Calculation of loss incurred due to incorrect rate selection had Rowan scheme of bonus payment followed:

	M (₹)	J (₹)	Total(₹)
Basic Wages	1,200 (100 Hrs. × 12)	1,680 (140 Hrs. × 12)	2,880
Excess Wages Paid	200 $\left(\frac{\text{Time taken}}{\text{Time allowed}} \times \text{Time saved} \times \text{Wage rate} \right)$ $\left(\frac{100}{120} \times 20 \times 12 \right)$	280 $\left(\frac{140}{168} \times 28 \times 12 \right)$	480
Excess Wages Paid	1,400	1,960	3,360

(iii) Calculation of amount that could have been saved if Rowan Scheme were Followed

	M (₹)	J (₹)	Total(₹)
Wages paid under Halsey Scheme	1,320	1,848	3,168
Wages paid under Rowan Scheme	1,400	1,960	3,360
Difference (loss)	(80)	(112)	(192)

(iv) Rowan Scheme of incentive payment has the following benefits, which is suitable with the nature of business in which JBL Sisters operates:

- (a) Under Rowan Scheme of bonus payment, workers cannot increase their earnings or bonus by merely increasing its work speed. Bonus under Rowan Scheme is maximum when the time taken by a worker on a job is half of the time allowed. As this fact is known to the workers, therefore, they work at such a speed which helps them to maintain the quality of output too.
- (b) If the rate setting department commits any mistake in setting standards for time to be taken to complete the works, the loss incurred will be relatively low.

Q.23

Piece Rete System

MTP May 22



The standard time allowed for a certain piece of work is 240 hours. Normal wage rate is ₹ 75 per hour. The bonus system applicable to the work is as follows:

Percentage of time saved to time allowed (slab rate)	Bonus
(i) Up to the first 20% of time allowed	25% of the corresponding saving in time.
(ii) For and within the next 30% of time allowed	40% of the corresponding saving in time.
(iii) For and within the next 30% of time allowed	30% of the corresponding saving in time.
(iv) For and within the next 20% of time allowed	10% of the corresponding saving in time.

CALCULATE the total earnings of a worker over the piece of work and his earnings per hour when he takes-

- (a) 256 hours,
 (b) 120 hours, and
 (c) 24 hours respectively.

Ans.

Calculation of total earnings and earnings per hour:

	Particulars	(a) Time taken is 256 hours	(b) Time taken is 120 hours	(c) Time taken is 24 hours
A.	Time Allowed	240 hours	240 hours	240 hours
B.	Time taken	256 hours	120 hours	24 hours
C.	Time Saved (A-B)	Nil	120 hours	216 hours
D.	Bonus hours (Refer workings)	Nil	40.80 hours	64.80 hours
E.	Hours to be paid (B+D)	256 hours	160.80 hours	88.80 hours
F.	Wages rate per hour	₹ 75	₹ 75	₹ 75
G.	Total earnings (E×F)	₹ 19,200	₹ 12,060	₹ 6,660
H.	Earnings per hour (G÷B)	₹ 75	₹ 100.50	₹ 277.50

Working Notes:

Calculation of bonus hours:

	Time saved 120 hours	Time saved 216 hours
For first 20% of time allowed i.e. 48 hours	12 (25% of 48 hours)	12 (25% of 48 hours)
For next 30% of time allowed i.e. 72 hours	28.80 (40% of 72 hours)	28.80 (40% of 72 hours)
For next 30% of time allowed i.e. 72 hours	-	21.60 (30% of 72 hours)
For next 20% of time allowed i.e. 48 hours	-	2.40 (10% of 24 hours)
Bonus hours	40.80	64.80

Q.24

Profit lost due to Labour T/o

MTP May 19



Anirban Ltd. wants to ascertain the profit lost during the year 20X8-X9 due to increased labour turnover. For this purpose, they have given you the following information:



- (1) Training period of the new recruits is 50,000 hours. During this period their productivity is 60% of the experienced workers. Time required by an experienced worker is 10 hours per unit.
- (2) 20% of the output during training period was defective. Cost of rectification of a defective unit was Rs. 25.
- (3) Potential productive hours lost due to delay in recruitment were 1,00,000 hours.
- (4) Selling price per unit is Rs.180 and P/V ratio is 20%.
- (5) Settlement cost of the workers leaving the organization was Rs.1,83,480.
- (6) Recruitment cost was Rs.1,56,340
- (7) Training cost was Rs.1,13,180.

You are required to **CALCULATE** the profit lost by the company due to increased labour turnover during the year 20X8-X9.

Ans. Output by experienced workers in 50,000 hours = $\frac{50,000}{10} = 5,000$ units

∴ Output by new recruits = 60% of 5,000 = 3,000
 units Loss of output = 5,000 - 3,000 = 2,000 units
 Total loss of output = Due to delay recruitment + Due to inexperience
 = 10,000 + 2,000 = 12,000 units
 Contribution per unit = 20% of 180 = Rs. 36
 Total contribution cost = 36 × 12,000 = Rs. 4,32,000
 Cost of repairing defective units = 3,000 × 0.2 × 25 = Rs. 15,000

Profit forgone due to labour turnover

	(₹)
Loss of Contribution	4,32,000
Cost of repairing defective units	15,000
Recruitment cost	1,56,340
Training cost	1,13,180
Settlement cost of workers leaving	1,83,480
Profit forgone in 2017-18	9,00,000

Q. 25

Profit lost due to Labour T/o

MTP May22



R Ltd. is facing increasing employee turnover in the factory and before analyzing the causes and taking remedial steps; the management wants to have an idea of the profit foregone as a result of employee turnover in the last year.

Last year sales amounted to ₹ 99,63,960 and P/V ratio was 20%.

The total number of actual hours worked by the direct employee force was 5.34 lakhs. The actual direct employee hours included 36,000 hours attributable to training new recruits, out of which half of the hours were unproductive. As a result of the delays by the Personnel Department in filling vacancies due to employee turnover, 1,20,000 potentially productive hours (excluding unproductive training hours) were lost.

The costs incurred consequent on employee turnover revealed, on analysis, the following:

Settlement cost due to leaving	₹ 52,584
Recruitment costs	₹ 32,088
Selection costs	₹ 15,300
Training costs	₹ 36,588

Assuming that the potential production lost as a consequence of employee turnover could have been sold at prevailing prices, **FIND** the profit foregone last year on account of employee turnover.

Ans.

Workings:

(i) **Computation of productive hours**

Actual hours worked	5,34,000
Less: Unproductive training hours	18,000

Actual productive hours 5,16,000

(ii) Productive hours lost:

 Loss of potential productive hours + Unproductive training hours
 = 1,20,000 + 18,000 = 1,38,000 hours

(i) Loss of contribution due to unproductive hours:

$$\frac{\text{Sales value}}{\text{Actual productive hours}} \times \text{Total unproductive hours}$$

$$= \frac{99,63,960}{5,16,000 \text{ hrs}} \times 1,38,000 \text{ hours} = ₹ 26,64,780$$

$$\text{Contribution lost for 1,38,000 hours} = \frac{26,64,780}{100} \times 20 = 5,32,956$$
Computation of profit forgone on account of employee turnover

	(₹)
Contribution foregone (as calculated above)	5,32,956
Settlement cost due to leaving	52,584
Recruitment cost	32,088
Selection cost	15,300
Training costs	36,588
Profit foregone	6,69,516

Q.26

Workers left, joined & average

RTP Nov 22



HR Ltd. is progressing in its legal industry. One of its trainee executives, Mr. H, in the Personnel department has calculated labour turnover rate 24.92% for the last year using Flux method.

Following is the data provided by the Personnel department for the last year:

Employees	At the beginning	Joined	Left	At the end
Records clerk	810	1,620	90	2,340
Human Resource Manager	?	30	90	60
Legal Secretary	?	90	---	?
Staff Attorney	?	30	30	?
Associate Attorney	?	30	---	45
Senior Staff Attorney	6	---	---	18
Senior Records clerk	12	---	---	51
Litigation attorney	?	---	---	?
Employees transferred from the Subsidiary Company				
Senior Staff Attorney	---	12	---	---
Senior Records clerk	---	39	---	---
Employees transferred to the Subsidiary Company				
Litigation attorney	---	---	90	---
Associate Attorney	---	---	15	---

At the beginning of the year there were total 1,158 employees on the payroll of the company. The opening strength of the Legal Secretary, Staff Attorney and Associate Attorney were in the ratio of 3 : 3 : 2.



The company has decided to abandon the post of Litigation attorney and consequently all the Litigation attorneys were transferred to the subsidiary company.

The company and its subsidiary are maintaining separate set of books of account and separate Personnel Department.

You are required to:

- CALCULATE Labour Turnover rate using Replacement method and Separation method.
- VERIFY the Labour turnover rate calculated under Flux method by Mr. H

Ans.

Working Notes:

- (i) **Calculation of no. of employees at the beginning and end of the year**

	At the Beginning of the year	At the end of the year
Records clerk	810	2,340
Human Resource Manager [Left- 90 +Closing- 60 - Joined- 30]	120	60
Legal Secretary*	45	135
Staff Attorney*	45	45
Associate Attorney*	30	45
Senior Staff Attorney	6	18
Senior Records clerk	12	51
Litigation attorney	90	0
Total	1,158	2,694

(*) At the beginning of the year:

Strength of Legal Secretary, Staff Attorney and Associate Attorney =

[1158 - {810 + 120 + 6 + 12 + 90} employees] or [1158 - 1038 = 120 employees]

[[Legal Secretary - $120 \times \frac{3}{8} = 45$, Staff Attorney - $120 \times \frac{3}{8} = 45$ & Associate Attorney - $120 \times \frac{2}{8} = 30$] employees]

At the end of the year:

[Legal Secretary - (Opening 45 + 90 Joining) = 135; Staff Attorney - (Opening 45 + 30 Joined - 30 Left) = 45]

- (ii) **No. of Employees Separated, Replaced and newly recruited during the year**

Particulars	Separations	New Recruitment	Replacement	Total Joining
Records clerk	90	1,530	90	1,620
Human Resource Manager	90	--	30	30
Legal Secretary	--	90	--	90
Staff Attorney	30	--	30	30
Associate Attorney	15	15	15	30
Senior Staff Attorney	--	12	--	12
Senior Records clerk	--	39	--	39
Litigation attorney	90	--	--	--
Total	315	1,686	165	1,851

(Since, HR Ltd. and its subsidiary are maintaining separate Personnel Department, so transfer-in and transfer-out are treated as recruitment and separation respectively.)

- (a) Calculation of Labour Turnover rate:

$$\text{Replacement Method} = \frac{\text{No. of employees replaced during the year}}{\text{Average no. of employees on roll}} \times 100$$

$$= \frac{165}{(1,158 + 2,694) / 2} \times 100 = \frac{165}{1,926} \times 100 = 8.57\%$$

$$\text{Separation Method} = \frac{\text{No. of employees separated during the year}}{\text{Average no. of employees on roll}} \times 100$$

$$= \frac{315}{1,926} \times 100 = 16.36\%$$

(b) Labour Turnover rate under Flux Method:

$$\frac{\text{No. of employees (Joined + Separated) during the year}}{\text{Average no. of employees on roll}} \times 10$$

$$= \frac{\text{No. of employees (Replaced + New recruited + Separated) during the year}}{\text{Average no. of employees on roll}} \times 100$$

$$\frac{1,851 + 315}{1,926} \times 100 = 112.46\%$$

Labour Turnover rate calculated by Mr. H is incorrect as it seems he has not taken the No. of new recruitment while calculating the labour turnover rate under Flux method.

Q. 27

Calculate wages payable

ICAI MAT



It is seen from the job card for repair of the customer's equipment that a total of 154 labour hours have been put in as detailed below:

	Worker 'A' paid at ₹ 200 per day of 8 hours	Worker 'B' paid at ₹ 100 per day of 8 hours	Worker 'C' paid at ₹ 300 per day of 8 hours
Monday (hours)	10.5	8.0	10.5
Tuesday (hours)	8.0	8.0	8.0
Wednesday (hours)	10.5	8.0	10.5
Thursday (hours)	9.5	8.0	9.5
Friday (hours)	10.5	8.0	10.5
Saturday (hours)	--	8.0	8.0
Total (hours)	49.0	48.0	57.0

In terms of an award in employee conciliation, the workers are to be paid dearness allowance on the basis of cost of living index figures relating to each month which works out @ ₹ 968 for the relevant month. The dearness allowance is payable to all workers irrespective of wages rate if they are present or are on leave with wages on all working days.

Each worker has to work for 8 hours on weekdays. Saturday and Sunday will be weekly holiday, however workers may work on Saturdays due to exigency of work for 4 hours, though full payment of 8 hours will be made with no other payments.

Overtime is paid twice of ordinary wage rate if a worker works for more than nine hours in a day. Excluding holidays, the total number of hours works out to 176 in the relevant month. The company's contribution to Provident Fund and Employees State Insurance Premium are absorbed into overheads.

CALCULATE the wages payable to each worker.

Ans.

Calculation of hours to be paid for worker A:

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal



					hours
Monday	8	1	$1\frac{1}{2}$	3	12
Tuesday	8	--	--	--	8
Wednesday	8	1	$1\frac{1}{2}$	3	12
Thursday	8	1	$\frac{1}{2}$	1	10
Friday	8	1	$1\frac{1}{2}$	3	12
Saturday	--	--	--	--	--
Total	40	4	5	10	54

Calculation of hours to be paid for worker B:

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
Monday	8	---	---	---	8
Tuesday	8	---	---	---	8
Wednesday	8	---	---	---	8
Thursday	8	---	---	---	8
Friday	8	---	---	---	8
Saturday	4	4*	---	---	8
Total	44	4	---	---	48

(*Worker-B has not worked more than 9 hours in any day)

Calculation of hours to be paid for worker C:

	Normal hours	Extra hours	Overtime hours	Equivalent normal hours for overtime worked	Total normal hours
Monday	8	1	$1\frac{1}{2}$	3	12
Tuesday	8	---	---	---	8
Wednesday	8	1	$1\frac{1}{2}$	3	12
Thursday	8	1	$\frac{1}{2}$	1	10
Friday	8	1	$1\frac{1}{2}$	3	12
Saturday	8*	---	---	---	8
Total	48	4	5	10	62

(*Worker-C will be paid for equivalent 8 hours, though 4 hours of working is required on Saturday. Further, no overtime will be paid for working beyond 4 hours since it is paid for working beyond 9 hours.)

Wages payable:

	A	B	C
Basic Wages per hour (₹)	25.00	12.50	37.50

Dearness allowance per hour (₹)	5.50	5.50	5.50
Hourly rate (₹)	30.50	18.00	43.00
Total normal hours	54.00	48.00	62.00
Total Wages payable (₹)	1,647.00	864.00	2,666.00

Q.28

PY Sep 24



In a factory there are 50 workers, working 8 hours per day including 30 minutes for lunch break, worked for 160 days during a period of six months ended on 31st December, 2023. During this period total employee's cost was recorded ₹ 3,90,000. The management of the factory decided the overtime premium rates for the month of January 2024 as under :

Sundays and holidays	180% of basic wages rate
Before and after normal working hours	160% of basic wages rate

During the last six months (ended on 31st December, 2023), the following hours were worked:

Normal time	56,250
Sundays and holidays	750
Before and after normal working hours	3,000
Total hours	60,000

During the month of January 2024, the factory worked on a job BX in the following manner.

Normal working	2,400	men hours
Overtime on Sundays and holidays	200	men hours
Overtime before and after normal working	400	men hours
Total hours	3,000	

You are required to calculate the labour cost chargeable to job BX and overheads in each of the following situations:

- Where overtime is worked regularly in whole year as a policy on account of shortage of workers.
- Where overtime is worked irregularly to meet the requirement of production.
- Where overtime is worked at the request of the customer to complete the job in time.
- Where overtime is worked on account of flood in the area.

Ans.

Workings

Calculation of Basic Wage Rate

Effective Working Hours for six months ended 31st December, 2023

= 50 workers × (8-0.5) hours per day × 160 days = 60,000 hours

$$\text{Basic Wage Rate} = \frac{3,90,000}{60,000}$$

= ₹ 6.50 per hour

Basic wage rate	:	₹ 6.50 per hour
Overtime wage rate for Sundays and holidays	:	₹ 6.50 × 180%
		= ₹ 11.70 per hour
Overtime wage rate before and after working hours	:	₹ 6.50 × 160%
		= ₹ 10.40 per hour

Computation of average inflated wage rate (including overtime premium):

Particulars	(₹)
-------------	-----



Annual wages for the normal time (56,250 hrs × ₹ 6.50)	3,65,625
Wages for overtime on Sundays and holidays (750 hrs × ₹ 11.70)	8,775
Wages for overtime before and after working hours (3,000 hrs × ₹ 10.40)	31,200
Total wages for 60,000 hrs	4,05,600

$$\text{Average inflated wage rate} = \frac{4,05,000}{60,000 \text{ hours}} = ₹6.76 \text{ per hour}$$

(a) **Where overtime is worked regularly as a policy due to shortage of workers:**

The overtime premium is treated as a part of employee cost and job is charged at an inflated wage rate.

Hence, employee cost chargeable to job BX

$$= \text{Total hours} \times \text{Inflated wage rate} = 3,000 \text{ hrs.} \times ₹ 6.76 = ₹ 20,280$$

(b) **Where overtime is worked irregularly to meet the requirements of production:**

Basic wage rate is charged to the job and overtime premium is charged to factory overheads as under:

Employee cost chargeable to Job BX: 3,000 hours @ ₹ 6.50 per hour

$$= ₹ 19,500$$

$$\text{Factory overhead: } \{200 \text{ hrs.} \times ₹ (11.70 - 6.50)\} + \{400 \text{ hrs} \times ₹ (10.40 - 6.50)\} = \{₹ 1,040 + ₹ 1,560\} = ₹ 2,600$$

(c) **Where overtime is worked at the request of the customer to complete the job in time.**

Basic wage rate is charged to the job and overtime premium is charged to job as under:

Employee cost chargeable to Job BX: 3,000 hours @ ₹ 6.50 per hour = ₹ 19,500

$$\text{Overtime premium: } \{200 \text{ hrs} \times ₹ (11.70 - 6.50)\} + \{400 \text{ hrs} \times ₹ (10.40 - 6.50)\} = \{₹ 1,040 + ₹ 1,560\} = ₹ 2,600$$

$$\text{Total} = ₹ 19,500 + ₹ 2,600 = ₹ 22,100$$

(d) **Where overtime is worked on account of flood in the area**

Basic wage rate is charged to the job and overtime premium is charged to costing P & L Account as under:

Employee cost chargeable to Job BX: 3,000 hours @ ₹ 6.50 per hour = ₹ 19,500

$$\text{Costing P\&L A/c : } \{200 \text{ hrs} \times ₹ (11.70 - 6.50)\} + \{400 \text{ hrs} \times ₹ (10.40 - 6.50)\} = \{₹ 1,040 + ₹ 1,560\} = ₹ 2,600$$

$$\text{Total} = ₹ 19,500 + ₹ 2,600 = ₹ 22,100$$

4

 CHAPTER

OVERHEADS

Q. 29

Machine Hour Rate

PY Nov 22



USP Ltd. is the manufacturer of 'double grip motorcycle tyres'. In the manufacturing process, it undertakes three different jobs namely, Vulcanising, Brushing and Striping. All of these jobs require the use of a special machine and also the aid of a robot when necessary. The robot is hired from outside and the hire charges paid for every six months is ₹ 2,70,000. An estimate of overhead expenses relating to the special machine is given below:

- Rent for a quarter is ₹ 18,000.
- The cost of the special machine is ₹ 19,20,000 and depreciation is charged @10% per annum on straight line basis.
- Other indirect expenses are recovered at 20% of direct wages.

The factory manager has informed that in the coming year, the total direct wages will be ₹ 12,00,000 which will be incurred evenly throughout the year.

During the first month of operation, the following details are available from the job book:

Number of hours the special machine was used

Jobs	Without the aid of the robot	With the of the robot
Vulcanising	500	400
Brushing	1000	400
Striping	-	1200

You are required to :

- Compute the Machine Hour Rate for the company as a whole for a month (A) when the robot is used and (B) when the robot is not used.
- Compute the Machine Hour Rate for the individual jobs i.e. Vulcanising, Brushing and Striping.

Ans.

Working notes:

(I) Total machine hours use (500 + 1,000 + 400 + 400 + 1,200)	3,500
(II) Total machine hours without the use of robot (500 + 1,000)	1,500
(III) Total machine hours with the use of robot (400 + 400 + 1,200)	2,000
(IV) Total overheads of the machine per month	
Rent (₹ 18,000 ÷ 3 months)	6,000
Depreciation [(₹ 19,20,000 × 10%) ÷ 12 months]	16,000
Indirect expenses [(₹ 12,00,000 × 20%) ÷ 12 months]	20,000
Total	42,000
(V) Robot hire charges for a month (₹ 2,70,000 ÷ 6 months)	₹ 45,000
(VI) Overheads for using machines without robot	
$\frac{42,000}{3,500 \text{ Hours}} \times 1,500 \text{ hrs.} =$	18,000
(VII) Overheads for using machines with robot	
$\frac{42,000}{3,500 \text{ Hours}} \times 2,000 \text{ hrs.} + 45,000 =$	69,000



- (i) Computation of Machine hour rate for the firm as a whole for a month.

(A) When the robot was used: $\frac{69,000}{2,000} = 34.50$ Per Hour

(B) When the robot was not used: $\frac{18,000}{15,000} = 12$ Per Hour

- (ii) Computation of Machine hour rate for the individual job

	Rate per hour	Job					
		Vulcanising		Brushing		Striping	
	(₹)	Hrs.	(₹)	Hrs.	(₹)	Hrs.	(₹)
Overheads							
Without robot	12.00	500	6,000	1,000	12,000	-	-
With robot	34.50	400	13,800	400	13,800	1,200	41,400
Total		900	19,800	1,400	25,800	1,200	41,400
Machine hour rate			22		18.43		34.50

Q.30

Comprehensive Mac. Hour Rate

RTP Nov 18



Sree Ajeet Ltd. having fifteen different types of automatic machines furnishes information as under for 20X8-20X9

- (i) Overhead expenses: Factory rent ₹ 1,80,000 (Floor area 1,00,000 sq. ft.), Heat and gas ₹ 60,000 and supervision ₹ 1,50,000.
- (ii) Wages of the operator are ₹ 200 per day of 8 hours. Operator attends to one machine when it is under set up and two machines while they are under operation.

In respect of machine B (one of the above machines) the following particulars are furnished:

- (i) Cost of machine ₹1,80,000, Life of machine- 10 years and scrap value at the end of its life ₹ 10,000
- (ii) Annual expenses on special equipment attached to the machine are estimated as ₹12,000
- (iii) Estimated operation time of the machine is 3,600 hours while set up time is 400 hours per annum
- (iv) The machine occupies 5,000 sq. ft. of floor area.
- (v) Power costs ₹ 5 per hour while machine is in operation.

ESTIMATE the comprehensive machine hour rate of machine B. Also find out machine costs to be absorbed in respect of use of machine B on the following two work orders

	Work order- 1	Work order-2
Machine set up time (Hours)	15	30
Machine operation time (Hours)	100	190

Ans.

Sree Ajeet Ltd.

Statement showing comprehensive machine hour rate of Machine B

	(₹)
Standing Charges:	
Factory rent {(₹ 1,80,000/1,00,000 sq. ft.) × 5,000 Sq. ft.}	9,000
Heat and Gas (₹ 60,000/15 machines)	4,000
Supervision (₹ 1,50,000/ 15 machines)	10,000
Depreciation [(₹ 1,80,000 - ₹ 10,000)/ 10 years]	17,000
Annual expenses on special equipment	12,000
	52,000
Fixed cost per hour (₹ 52,000/ 4,000 hrs.)	13/-

	Set up rate Per hour (₹)	Operational rate Per hour (₹)
--	--------------------------	-------------------------------

Fixed cost	13.00	13.00
Power	--	5.00
Wages	25.00	12.50
Comprehensive machine hour rate per hr.	38.00	30.50

**Statement of 'B' machine costs
to be absorbed on the two work orders**

	Work order-1			Work order-2		
	Hours	Rate	Amount	Hours	Rate	Amount
		₹	₹	₹	₹	₹
Set up time cost	15	38	570	30	38	1,140
Operation time cost	100	30.5	3,050	190	30.5	5,795
Total cost			3,620			6,935

Q.31

Reapportionment

RTP May 22



Pretz Ltd. is a manufacturing company having two production departments, 'A' & 'B' and two service departments 'X' & 'Y'. The following is the budget for March, 2022:

	Total (₹)	A (₹)	B (₹)	X (₹)	Y (₹)
Direct material		2,00,000	4,00,000	4,00,000	2,00,000
Direct wages		10,00,000	4,00,000	2,00,000	4,00,000
Factory rent	9,00,000				
Power (Machine)	5,10,000				
Depreciation	2,00,000				
General Lighting	3,00,000				
Perquisites	4,00,000				
Additional information:					
Area (Sq. ft.)		500	250	250	500
Capital value of assets (₹ lakhs)		40	80	20	20
Light Points		10	20	10	10
Machine hours		1,000	2,000	1,000	1,000
Horse power of machines		50	40	15	25

A technical assessment of the apportionment of expenses of service departments is as under:

	A	B	X	Y
Service Dept. 'X' (%)	55	25	-	20
Service Dept. 'Y' (%)	60	35	5	-

You are required to:

- PREPARE a statement showing distribution of overheads to various departments.
- PREPARE a statement showing re-distribution of service departments expenses to production departments using-
 - Simultaneous equation method
 - Trial and error method
 - Repeated Distribution Method.

Ans.

Primary Distribution of Overheads

	Basis	Total (₹)	A (₹)	B (₹)	X (₹)	Y (₹)
Direct materials	Direct	6,00,000	-	-	4,00,000	2,00,000
Direct wages	Direct	6,00,000	-	-	2,00,000	4,00,000



Factory rent (2:1:1:2)	Area	9,00,000	3,00,000	1,50,000	1,50,000	3,00,000
Power (Machine) (10:16:3:5)*	H.P. × Machine Hrs.	5,10,000	1,50,000	2,40,000	45,000	75,000
Depreciation (2:4:1:1)	Capital value	2,00,000	50,000	1,00,000	25,000	25,000
General Lighting (1:2:1:1)	Light Points	3,00,000	60,000	1,20,000	60,000	60,000
Perquisites (5:2:1:2)	Direct Wages	4,00,000	2,00,000	80,000	40,000	80,000
		35,10,000	7,60,000	6,90,000	9,20,000	11,40,000

*{(1000×50) : (2000×40) : (1000×15) : (1000×25)}

(50000 : 80000 : 15000 : 25000)

(10 : 16 : 3 : 5)

(i) **Redistribution of Service Department's expenses using 'Simultaneous equation method'**

$$X = 9,20,000 + 0.05 Y$$

$$Y = 11,40,000 + 0.20 X$$

Substituting the value of X,

$$Y = 11,40,000 + 0.20 (9,20,000 + 0.05 Y)$$

$$= 13,24,000 + 0.01 Y$$

$$Y - 0.01 Y = 13,24,000$$

$$Y = 13,24,000$$

$$0.99$$

$$Y = ₹ 13,37,374$$

The total expense of Y is ₹ 13,37,374 and that of X is ₹ 9,86,869 i.e., ₹ 9,20,000 + (0.05 × ₹ 13,37,374).

Distribution of Service departments' overheads to Production departments

	Production Departments	
	A (₹)	B (₹)
Overhead as per primary distribution	7,60,000	6,90,000
Dept- X (55% and 25% of ₹ 9,86,869)	5,42,778	2,46,717
Dept- Y (60% and 35% of ₹ 13,37,374)	8,02,424	4,68,081
	21,05,202	14,04,798

(i) **Redistribution of Service Department's expenses using 'Trial and Error Method':**

	Service Departments	
	X (₹)	Y (₹)
Overheads as per primary distribution	9,20,000	11,40,000
(i) Apportionment of Dept-X expenses to Dept-Y (20% of ₹ 9,20,000)	---	1,84,000
	---	13,24,000
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 13,24,000)	66,200	---
(i) Apportionment of Dept-X expenses to Dept-Y (20% of ₹ 66,200)	---	13,240
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 13,240)	662	---
(i) Apportionment of Dept-X expenses to Dept-Y (20% of ₹ 662)		132
(ii) Apportionment of Dept-Y expenses to Dept-X (5% of ₹ 132)	7	
Total	9,86,869	13,37,372

Distribution of Service departments' overheads to Production departments

	Production Departments	
	A (₹)	B (₹)
Overhead as per primary distribution	7,60,000	6,90,000
Dept- X (55% and 25% of ₹ 9,86,869)	5,42,778	2,46,717
Dept- Y (60% and 35% of ₹ 13,37,372)	8,02,423	4,68,080
	21,05,201	14,04,797

(iii) Redistribution of Service Department's expenses using 'repeated distribution method':

	A (₹)	B (₹)	X (₹)	Y (₹)
Overhead as per primary distribution	7,60,000	6,90,000	9,20,000	11,40,000
Dept. X overhead apportioned in the ratio (55:25:—:20)	5,06,000	2,30,000	(9,20,000)	1,84,000
Dept. Y overhead apportioned in the ratio (60:35:5: —)	7,94,400	4,63,400	66,200	(13,24,000)
Dept. X overhead apportioned in the ratio (55:25:—:20)	36,410	16,550	(66,200)	13,240
Dept. Y overhead apportioned in the ratio (60:35:5: —)	7,944	4,634	662	(13,240)
Dept. X overhead apportioned in the ratio (55:25:—:20)	364	166	(662)	132
Dept. Y overhead apportioned in the ratio (60:35:5: —)	79	46	7	(132)
Dept. X overhead apportioned in the ratio (55:25:—:20)	4	3	(7)	-
	21,05,201	14,04,799	-	-

Q.32

Overhead Recovery Rate

PY May 22



SNS Trading Company has three Main Departments and two Service Departments. The data for each department is given below:

Departments	Expenses (in ₹)	Area in (Sq. Mtr)	Number of Employees
Main Department:			
Purchase Department	5,00,000	12	800
Packing Department	8,00,000	15	1700
Distribution Department	3,50,000	7	700
Service Departments:			
Maintenance Department	6,40,000	4	200
Personnel Department	3,20,000	6	250

The cost of Maintenance Department and Personnel Department is distributed on the basis of 'Area in Square Metres' and 'Number of Employees' respectively.

You are required to:

- (i) Prepare a Statement showing the distribution of expenses of Service Departments to the Main Departments using the "Step Ladder method" of Overhead Distribution.



- (ii) Compute the Rate per hour of each Main Department, given that, the Purchase Department, Packing Department and Distribution Department works for 12 hours a day, 24 hours a day and 8 hours a day respectively. Assume that there are 365 days in a year and there are no holidays.

Ans

- (i) Schedule Showing the Distribution of Expenses of Service Departments using Step ladder method.

	Main Department			Service Department	
	Purchase (₹)	Packing (₹)	Distribution (₹)	Maintenance (₹)	Personnel (₹)
Expenses	5,00,000	8,00,000	3,50,000	6,40,000	3,20,000
Distribution of Maintenance Department (12:15:7:-:6)	1,92,000	2,40,000	1,12,000	(6,40,000)	96,000
Distribution of Personnel Department (800:1700:700:-:-)	1,04,000	2,21,000	91,000	-	(4,16,000)
Total	7,96,000	12,61,000	5,53,000	-	-

- (ii) Calculation of Expenses rate per hour of Main Department

	Purchase	Packing	Distribution
Total apportioned expenses (₹)	7,96,000	12,61,000	5,53,000
Total Hours worked	4,380	8,760	2,920
	(12 × 365)	(24 × 365)	(8 × 365)
Expenses rate per hour (₹)	181.74	143.95	189.38

Q.33

Overhead Recovery Rate

RTP May 20



In a manufacturing company, the overhead is recovered as follows: Factory Overheads: a fixed percentage basis on direct wages and administrative overheads: a fixed percentage basis on factory cost.

The company has furnished the following data relating to two jobs undertaken by it in a period.

	Job 1(₹)	Job 2(₹)
Direct materials	1,08,000	75,000
Direct wages	84,000	60,000
Selling price	3,33,312	2,52,000
Profit percentage on total cost	12%	20%

You are required to:

- Compute the percentage recovery rates of factory overheads and administrative overheads.
- Calculate the amount of factory overheads, administrative overheads and profit for each of the two jobs.
- Using the above recovery rates, determine the selling price to be quoted for job 3.

Additional data pertaining to Job 3 is as follows

Direct materials	₹ 68,750
Direct wages	₹ 22,500
Profit percentage on selling price	15%

Ans

- (i) Computation of percentage recovery rates of factory overheads and administrative overheads.

Let the factory overhead recovery rate as percentage of direct wages be F and administrative overheads recovery rate as percentage of factory cost be A.

Factory Cost of Jobs:

Direct materials + Direct wages + Factory overhead For Job 1 = ₹ 1,08,000 + ₹ 84,000 + ₹ 84,000F

For Job 2 = ₹ 75,000 + ₹ 60,000 + ₹ 60,000F

Total Cost of Jobs:

Factory cost + Administrative overhead

For Job 1 = (₹ 1,92,000 + ₹ 84,000F) + (₹ 1,92,000 + ₹ 84,000F) A = ₹ 2,97,600* For

Job-2 = (₹ 1,35,000 + ₹ 60,000F) + (₹ 1,35,000 + ₹ 60,000F) A = ₹ 2,10,000**

The value of F & A can be found using following equations

$$1,92,000 + 84,000F + 1,92,000A + 84,000AF = ₹ 2,97,600 \quad \dots \text{eqn (i)}$$

$$1,35,000 + 60,000F + 1,35,000A + 60,000AF = ₹ 2,10,000 \quad \dots \text{eqn (ii)}$$

Multiply equation (i) by 5 and equation (ii) by 7

$$9,60,000 + 4,20,000F + 9,60,000A + 4,20,000AF = ₹ 14,88,000 \quad \dots \text{eqn (iii)}$$

$$9,45,000 + 4,20,000F + 9,45,000A + 4,20,000AF = ₹ 14,70,000 \quad \dots \text{eqn (iv)}$$

$$- \quad - \quad - \quad - \quad - \quad -$$

$$15,000 + 15,000A = ₹ 18,000$$

$$15,000 A = 18,000 - 15,000$$

$$A = 0.20$$

Now putting the value of A in equation (i) to find the value of F

$$1,92,000 + 84,000F + (1,92,000 \times 0.20) + (84,000 F \times 0.20) = ₹ 2,97,600$$

Or

$$1,92,000 + 84,000F + 38,400 + 16,800 F = ₹ 2,97,600$$

$$1,00,800 F = 67,200$$

$$F = 0.667$$

On solving the above relations: F = 0.667 and A = 0.20

Hence, percentage recovery rates of:

Factory overheads = 66.7% or 2/3rd of wages and Administrative overheads = 20% of factory cost.

Working note:

$$\text{Total Cost} = \frac{\text{Selling price}}{(100\% + \text{Percentage of profit})}$$

$$\text{*For Job 1} = \frac{3,33,312}{(100\% + 12\%)} = ₹ 2,97,600$$

$$\text{**For Job 2} = \frac{2,52,000}{(100\% + 20\%)} = ₹ 2,10,000$$

(ii) Statement of jobs, showing amount of factory overheads, administrative overheads and profit:

	Job 1	Job 2
	(₹)	(₹)
Direct materials	1,08,000	75,000
Direct wages	84,000	60,000
Prime cost	1,92,000	1,35,000
Factory overheads		
2/3rd of direct wages	56,000	40,000
Factory cost	2,48,000	1,75,000
Administrative overheads		
20% of factory cost	49,600	35,000
Total cost	2,97,600	2,10,000



Profit (12% & 20% respectively)	35,712	42,000
Selling price	3,33,312	2,52,000

(iii) Selling price of Job 3

	(₹)
Direct materials	68,750
Direct wages	22,500
Prime cost	91,250
Factory overheads (2/3rd of Direct Wages)	15,000
Factory cost	1,06,250
Administrative overheads (20% of factory cost)	21,250
Total cost	1,27,500
Profit margin (balancing figure)	22,500
Selling price Total Cost	
$\left\ \frac{\text{Total cost}}{85\%} \right\ $	1,50,000

Q.34

Overhead Recovery Rate

MTP Nov 22(2)



Madhu Ltd has calculated a predetermined overhead rate of ₹22 per machine hour for its Quality Check (QC) department. This rate has been calculated for the budgeted level of activity and is considered as appropriate for absorbing overheads. The following overhead expenditures at various activity levels had been estimated.

Total overheads	Number of machine hours
₹3,38,875	14,500
₹3,47,625	15,500
₹3,56,375	16,500

You are required to:

- COMPUTE the variable overhead absorption rate per machine hour.
- COMPUTE the estimated total fixed overheads.
- CALCULATE the budgeted level of activity in machine hours.
- CALCULATE the amount of under/over absorption of overheads if the actual machine hours were 14,970 and actual overheads were ₹3,22,000.

Ans

- (i) Computation of variable overhead absorption rate:

$$\text{Variable overhead absorption rate} = \frac{\text{Difference in Total overheads}}{\text{Difference in levels in terms of machine hours}}$$

$$= \frac{3,47,625 - 3,38,875}{15,500 \text{ hours} - 14,500 \text{ hours}} = \text{Rs. 8.75 per machine}$$

- (ii) Computation of Total fixed overheads:

	(₹)
Total overheads at 14,500 hours	3,38,875
Less: Variable overheads (Rs. 8.75 × 14,500)	(1,26,875)
Total fixed overheads	2,12,000

- (iii) Calculation of Budgeted level of activity in machine hours:

Let budgeted level of activity = X

$$\text{Then, } \frac{8.75 + 2,12,000}{X} = ₹32$$

$$8.75X + ₹2,12,000 = 22X$$

$$13.25X = 2,12,000$$

$$X = 16,000$$

Thus, budgeted level of activity = 16,000 machine hours.

(iv) Calculation of Under / Over absorption of overheads:

	(Rs.)
Actual overheads	3,22,000
Absorbed overheads (14,970 hours × Rs. 22 per hour)	3,29,340
Over-absorption (3,29,340 - 3,22,000)	7,340

Q.35

Predetermined OH Rate

RTP Nov 22



SE Limited manufactures two products- A and B. The company had budgeted factory overheads amounting to ₹ 36,72,000 and budgeted direct labour hour of 1,80,000 hours. The company uses pre-determined overhead recovery rate for product costing purposes.

The department-wise break-up of the overheads and direct labour hours were as follows:

Particulars	Budgeted overheads	Budgeted direct labour hours	Rate per direct labour hour
Department Pie	₹ 25,92,000	90,000 hours	₹ 28.80
Department Qui	₹ 10,80,000	90,000 hours	₹ 12.00
Total	₹ 36,72,000	1,80,000 hours	

Additional Information:

Each unit of product A requires 4 hours in department Pie and 1 hour in department Qui. Also, each unit of product B requires 1 hour in department Pie and 4 hours in department Qui.

This was the first year of the company's operation. There was no WIP at the end of the year. However, 1,800 and 5,400 units of Products A and B were on hand at the end of the year.

The budgeted activity has been attained by the company. You are required to:

- DETERMINE the production and sales quantities of both products 'A' and 'B' for the above year.
- ASCERTAIN the effect of using a pre-determined overhead rate instead of department-wise overhead rates on the company's income due to its effect on stock value.
- CALCULATE the difference in the selling price due to the use of pre-determined overhead rate instead of using department-wise overhead rates. Assume that the direct costs (material and labour costs) per unit of products A and B were ₹ 25 and ₹ 40 respectively and the selling price is fixed by adding 40% over and above these costs to cover profit and selling and administration overhead.

Ans

(i) Computation of production and sales quantities:

The products processing times are as under -

Product	A	B	Total
Department Pie	4 hours	1 hour	90,000 hours
Department Qui	1 hour	4 hours	90,000 hours

Let X and Y be the number of units (production quantities) of the two products. Converting these into equations, we have -



$$4X + Y = 90,000 \text{ \& } X + 4Y = 90,000$$

Solving the above, we get $X = 18,000$; $Y = 18,000$

Hence, the Production and Sales Quantities are determined as under -

Product	Production Quantity	Closing Stock (Given)	Sales Quantity (Balancing Figure)
A	18,000 units	1,800 units	16,200 units
B	18,000 units	5,400 units	12,600 units

(i) Effect of using pre-determined rate of overheads on the company's profit

Product	Closing Stock Quantity	Overhead included using pre-determined rate	Overhead included using department rate	Difference in overhead in closing stock value / Effect on closing stock value
A	1,800 units	1,800 × 5 hours × ₹ 20.40 = ₹ 1,83,600	Pie = 1,800 units × 4 hours × ₹ 28.80 = ₹ 2,07,360 Qui = 1,800 units × 1 hour × ₹ 12 = ₹ 21,600	(-) ₹ 45,360
B	5,400 units	5,400 × 5 hours × ₹ 20.40 = ₹ 5,50,800	Pie = 5,400 units × 1 hour × ₹ 28.80 = ₹ 1,55,520 Qui = 5,400 units × 4 hours × ₹ 12 = ₹ 2,59,200	(+) ₹ 1,36,080
Total		₹ 7,34,400	₹ 6,43,680	(+) ₹ 90,720

Use of pre-determined overhead rate has resulted in over valuation of stock by ₹ 90,720 due to which the company's income would be affected (increase) by ₹ 90,720. Profit would be affected only to the extent of Overhead contained in closing finished goods and closing WIP, if any.

(ii) Effect of using pre-determined on the products' selling prices

Particulars	Product A	Product B
Selling Price per unit if pre-determined overhead rate is used	₹177.80	₹ 198.80
Selling Price per unit if department wise rate is used	₹ 213.08	₹163.52
Difference	₹ 35.28 Under-Priced	₹ 35.28 Over-Priced

Workings:

$$(1) \text{ Pre-determined overhead recovery rate} = \frac{36,72,000}{1,80,000 \text{ hours}} = 20.40 \text{ per direct labour}$$

(2) If pre-determined recovery rate is used

Particulars	Product A in ₹	Product B in ₹
-------------	----------------	----------------

Materials & Labour	25.00	40.00
Add: Production Overhead	102.00	102.00
A = 5 hours x ₹ 20.40 per hour		
B = 5 hours x ₹ 20.40 per hour		
Cost of production	127.00	142.00
Add: 40% of margin	50.80	56.80
	177.80	198.50

(3) If department-wise recovery rate is used

Particulars	Product A in ₹	Product B in ₹
Materials & Labour	25.00	40.00
Add: Production Overhead	127.20	76.80
A = Pie = 4 hours x ₹ 28.80		
Qui = 1 hour x ₹ 12		
B = Pie = 1 hour x ₹ 28.80		
Qui = 4 hours x ₹ 12		
Cost of production	152.20	116.80
Add: 40% of margin	60.88	46.72
Selling Price per unit	213.08	163.52

Q.36

Unabsorbed OH

PY Nov 19



ABS Enterprises produces a product and adopts the policy to recover factory overheads applying blanket rate based on machine hours. The cost records of the concern reveal the following information:

Budgeted production overheads ₹ 10,35,000

Budgeted machine hours ₹ 90,000

Actual machine hours worked ₹ 45,000

Actual production overheads ₹ 8,80,000

Production overheads (actual) include-

Paid to worker as per court's award ₹ 50,000

Wages paid for strike period ₹ 38,000

Stores written off ₹ 22,000

Expenses of previous year booked in current year ₹ 18,500

Production -

Finished goods 30,000 units

Sale of finished goods 27,000 units

The analysis of cost information reveals that 1/3 of the under absorption of overheads was due to defective production planning and the balance was attributable to increase in costs.

You are required:

- To find out the amount of under absorbed production overheads.
- To give the ways of treating it in Cost Accounts.
- To apportion the under absorbed overheads over the items.



Ans (i) Amount of under absorption of production overheads:

Particular	Amount (₹)	Amount(₹)
Total production overheads actually incurred		8,80,000
Less: Amount paid to worker as per court order	50,000	
Wages paid for the strike period under an award	38,000	
Stores written off	22,000	
Expenses of previous year booked in the current year	18,500	1,28,500
		7,51,500
Less: Production overheads absorbed as per machine hour rate (45,000 hours × ₹11.50*)		5,17,500
Amount of under- absorbed production overheads		2,34,000

$$\text{*Budgeted Machine hour rate (Blanket rate)} = \frac{10,35,000}{90,000} = ₹ 11.50 \text{ per hour}$$

(ii) Accounting treatment of under absorbed production overheads:

(a) As 1/3rd of the under absorbed overheads were due to defective production planning, this being abnormal, hence should be debited to Costing Profit and Loss Account.

Amount to be debited to Costing Profit and Loss Account
 = ₹ 2,34,000 × 1/3 = ₹ 78,000.

(b) Balance of under absorbed production overheads should be distributed over Finished goods and Cost of sales by applying supplementary rate*.

Amount to be distributed = ₹ 2,34,000 × 2/3 = ₹1,56,000

$$\text{*Supplementary rate} = \frac{1,56,000}{30,000 \text{ units}} = ₹ 5.20 \text{ per unit}$$

(iii) Apportionment of under absorbed production overheads over Finished goods and Cost of sales:

Particular	Units	Amount (₹)
Finished goods (3,000 units × ₹5.20)	3,000	15,600
Cost of sales (27,000 units × ₹5.20)	27,000	1,40,400
Total	30,000	1,56,000

Q.37

Cost Sheet

ICAI MAT



A light engineering factory fabricates machine parts for customers. The factory commenced fabrication of 12 nos. machine parts as per customers' specifications, the expenditure incurred on the job for the week ending 21st August is as tabulated below:

	(₹)	(₹)
Direct materials (all items)		780.00
Direct labour (manual) 20 hours @ ₹ 15 per hour		300.00
Machine facilities :		
Machine No. I : 4 hours @ ₹ 45	180.00	
Machine No. II : 6 hours @ ₹ 65	390.00	570.00
Total		1,650.00
Overheads @ ₹ 8 per hour on 20 manual hours		160.00
Total cost		1,810.00

The overhead rate of ₹ 8 per hour is based on 3,000 man hours per week; similarly, the machine hour rates are based on the normal working of Machine Nos. I and II for 40 hours out of 45 hours per week.

After the close of each week, the factory levies a supplementary rate for the recovery of full overhead expenses on the basis of actual hours worked during the week. During the week ending 21st August, the total labour hours worked was 2,400 and Machine Nos. I and II had worked for 30 hours and 32.5 hours respectively. PREPARE a Cost Sheet for the job for the fabrication of 12 nos. machine parts duly levying the supplementary rates.

Ans

Fabrication of 12 nos. machine parts (job No)
 Date of commencement: 16th August Date of Completion:
Cost sheet for the week ending, August 21st:

	(₹)	(₹)
Direct materials (all items)		780.00
Direct labour (manual) 20 hours @ ₹ 15 per hour		300.00
Machine facilities:		
Machine No. I : 4 hours @ ₹ 45	180.00	
Machine No. II : 6 hours @ ₹ 65	390.00	570.00
Total		1,650.00
Overheads @ ₹ 8 per hour on 20 manual hours		160.00
Total cost		1,810.00
Supplementary Rates		
Overheads 20 hours @ ₹ 2 per hour (Refer WN-1)	40.00	
Machine facilities: (Refer WN-2)		
Machine No. I - 4 hours @ ₹ 15	60.00	
Machine No. II - 6 hours @ ₹ 15	90.00	190.00
Cost		2,000.00

Working notes (WN):

- Overheads budgeted: 3,000 man-hours × ₹8 = ₹24,000
 Actual hours: 2,400 man-hours
 Actual rate per hour ₹24,000 ÷ 2,400 hours = ₹10
 Supplementary charge ₹ 2 (₹10 - ₹8) per hour
- Machine facilities:

	Machine No. I	Machine No. II
Budgeted	₹1,800 (40 × ₹45)	₹2,600 (40 × ₹65)
Actual number of hours	30	32.5
Actual rate per hour	₹60.00	₹80.00
Supplementary rate per hour	₹ 15.00 (₹60.00 - ₹45.00)	₹ 15.00 (₹80.00 - ₹65.00)

**5**

CHAPTER

ACTIVITY BASED COSTING

Q.38

ABC v/s Absorption

RTP Nov



Family Store wants information about the profitability of individual product lines: Soft drinks, Fresh produce and Packaged food. Family store provides the following data for the year 20X7-X8 for each product line:

	Soft drinks	Fresh produce	Packaged food
Revenues	₹ 39,67,500	₹ 1,05,03,000	₹ 60,49,500
Cost of goods sold	₹ 30,00,000	₹ 75,00,000	₹ 45,00,000
Cost of bottles returned	₹ 60,000	₹ 0	₹ 0
Number of purchase orders placed	360	840	360
Number of deliveries received	300	2,190	660
Hours of shelf-stocking time	540	5,400	2,700
Items sold	1,26,000	11,04,000	3,06,000

Family store also provides the following information for the year 20X7-X8:

Activity	Description of activity	Total Cost	Cost-allocation base
Bottles returns	Returning of empty bottles	₹ 60,000	Direct tracing to soft drink line
Ordering	Placing of orders for purchases	₹ 7,80,000	1,560 purchase orders
Delivery	Physical delivery and receipt of goods	₹ 12,60,000	3,150 deliveries
Shelf stocking	Stocking of goods on store shelves and on-going restocking	₹ 8,64,000	8,640 hours of shelf-stocking time
Customer Support	Assistance provided to customers including check-out	₹ 15,36,000	15,36,000 items sold

Required:

- Family store currently allocates support cost (all cost other than cost of goods sold) to product lines on the basis of cost of goods sold of each product line. **CALCULATE** the operating income and operating income as a % of revenues for each product line.
- If Family Store allocates support costs (all costs other than cost of goods sold) to product lines using and activity based costing system, **CALCULATE** the operating income and operating income as a % of revenues for each product line.

Ans

- Statement of Operating income and Operating income as a percentage of revenues for each product line (When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Soft Drinks(₹)	Fresh Produce (₹)	Packaged Foods (₹)	Total (₹)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000

Cost of Goods sold (COGS): (B)	30,00,000	75,00,000	45,00,000	1,50,00,000
Support cost (30% of COGS): (C) (Refer working notes)	9,00,000	22,50,000	13,50,000	45,00,000
Total cost: (D) = {(B) + (C)}	39,00,000	97,50,000	58,50,000	1,95,00,000
Operating income: E= {(A)-(D)}	67,500	7,53,000	1,99,500	10,20,000
Operating income as a percentage of revenues: (E/A) × 100	1.70%	7.17%	3.30%	4.97%

Working notes:

1. Total support cost:

	(₹)
Bottles returns	60,000
Ordering	7,80,000
Delivery	12,60,000
Shelf stocking	8,64,000
Customer support	15,36,000
Total support cost	45,00,000

2. Percentage of support cost to cost of goods sold (COGS):

$$= \frac{\text{Total support cost}}{\text{Total cost of goods sold}} \times 100$$

$$= \frac{45,00,000}{1,50,00,000} \times 100 = 30\%$$

3. Cost for each activity cost driver:

Activity(1)	Total cost (₹) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]
Ordering	7,80,000	1,560 purchase orders	₹500 per purchase order
Delivery	12,60,000	3,150 deliveries	₹400 per delivery
Shelf-stocking	8,64,000	8,640 hours	₹100 per stocking hour
Customer support	15,36,000	15,36,000 items sold	₹1 per item sold

- (ii) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines using an activity -based costing system)

	Soft drinks (₹)	Fresh Produce (₹)	Packaged Food (₹)	Total (₹)
Revenues: (A)	39,67,500	1,05,03,000	60,49,500	2,05,20,000
Cost & Goods sold	30,00,000	75,00,000	45,00,000	1,50,00,000
Bottle return costs	60,000	0	0	60,000
Ordering cost* (360:840:360)	1,80,000	4,20,000	1,80,000	7,80,000
Delivery cost* (300:2190:660)	1,20,000	8,76,000	2,64,000	12,60,000
Shelf stocking cost* (540:5400:2700)	54,000	5,40,000	2,70,000	8,64,000



Customer Support cost* (1,26,000:11,04,000:3,06,000)	1,26,000	11,04,000	3,06,000	15,36,000
Total cost: (B)	35,40,000	1,04,40,000	55,20,000	1,95,00,000
Operating income C: {(A)- (B)}	4,27,500	63,000	5,29,500	10,20,000
Operating income as a % of revenues	10.78%	0.60%	8.75%	4.97%

Q.39

ABC v/s Absorption

RTP July



The following budgeted information relates to N Ltd. for the year 2021:

	Products		
	X	Y	Z
Production and Sales (units)	1,00,000	80,000	60,000
	(₹)	(₹)	(₹)
Selling price per unit	90	180	140
Direct cost per unit	50	90	95
	Hours	Hours	Hours
Machine department (machine hours per unit)	3	4	5
Assembly department (direct labour hours per unit)	6	4	3

The estimated overhead expenses for the year 2021 will be as below: Machine Department ₹ 73,60,000 Assembly Department ₹ 55,00,000 Overhead expenses are apportioned to the products on the following basis: Machine Department On the basis of machine hours Assembly Department On the basis of labour hours

After a detailed study of the activities the following cost pools and their respective cost drivers are found:

Cost Pool	Amount (₹)	Cost Driver	Quantity
Machining services	64,40,000	Machine hours	9,20,000 hours
Assembly services	44,00,000	Direct labour hours	11,00,000 hours
Set-up costs	9,00,000	Machine set-ups	9,000 set-ups
Order processing	7,20,000	Customer orders	7,200 orders
Purchasing	4,00,000	Purchase orders	800 orders

As per an estimate the activities will be used by the three products:

	Products		
	X	Y	Z
Machine set-ups	4,500	3,000	1,500
Customer orders	2,200	2,400	2,600
Purchase orders	300	350	150

You are required to PREPARE a product-wise profit statement using:

- Absorption costing method;
- Activity-based method.

Ans

- Profit Statement using Absorption costing method:

	Particulars	Product			Total
		X	Y	Z	
A.	Sales Quantity	1,00,000	80,000	60,000	2,40,000
B.	Selling price per unit (₹)	90	180	140	
C.	Sales Value (₹) [A×B]	90,00,000	1,44,00,000	84,00,000	3,18,00,000
D.	Direct cost per unit (₹)	50	90	95	
E.	Direct Cost (₹) [A×D]	50,00,000	72,00,000	57,00,000	1,79,00,000
F.	Overheads:				
(i)	Machine department (₹) (Working note-1)	24,00,000	25,60,000	24,00,000	73,60,000
(ii)	Assembly department (₹) (Working note-1)	30,00,000	16,00,000	9,00,000	55,00,000
G.	Total Cost (₹) [E+F]	1,04,00,000	1,13,60,000	90,00,000	3,07,60,000
H.	Profit (C-G)	(14,00,000)	30,40,000	(6,00,000)	10,40,000

(ii) Profit Statement using Activity based costing (ABC) method:

	Particulars	Product			Total
		X	Y	Z	
A.	Sales Quantity	1,00,000	80,000	60,000	
B.	Selling price per unit (₹)	90	180	140	
C.	Sales Value (₹) [A×B]	90,00,000	1,44,00,000	84,00,000	3,18,00,000
D.	Direct cost per unit (₹)	50	90	95	
E.	Direct Cost (₹) [A×D]	50,00,000	72,00,000	57,00,000	1,79,00,000
F.	Overheads: (Refer working note-3)				
(i)	Machining services (₹)	21,00,000	22,40,000	21,00,000	64,40,000
(ii)	Assembly services (₹)	24,00,000	12,80,000	7,20,000	44,00,000
(iii)	Set-up costs (₹)	4,50,000	3,00,000	1,50,000	9,00,000
(iv)	Order processing (₹)	2,20,000	2,40,000	2,60,000	7,20,000
(v)	Purchasing (₹)	1,50,000	1,75,000	75,000	4,00,000
G.	Total Cost (₹) [E+F]	1,03,20,000	1,14,35,000	90,05,000	3,07,60,000
H.	Profit (₹) (C-G)	(13,20,000)	29,65,000	(6,05,000)	10,40,000

Working Notes: 1.

		Products			Total
		X	Y	Z	
A.	Production (units)	1,00,000	80,000	60,000	
B.	Machine hours per unit	3	4	5	9,20,000
C.	Total Machine hours [A×B]	3,00,000	3,20,000	3,00,000	
D.	Rate per hour (₹)	8	8	8	
E.	Machine Dept. cost [C×D]	24,00,000	25,60,000	24,00,000	73,60,000
F.	Labour hours per unit	6	4	3	
G.	Total labour hours [A×F]	6,00,000	3,20,000	1,80,000	11,00,000
H.	Rate per hour (₹)	5	5	5	
I.	Assembly Dept. cost	30,00,000	16,00,000	9,00,000	55,00,000



	[G×H]				
--	-------	--	--	--	--

$$\text{Machine hour rate} = \frac{73,60,000}{9,20,000 \text{ hours}} = 8$$

$$\text{Labour hour rate} = \frac{55,00,000}{11,00,000 \text{ hours}} = 5$$

2. Calculation of cost driver rate

Cost Pool	Amount (₹)	Cost Driver	Quantity	Driver rate (₹)
Machining services	64,40,000	Machine hours	9,20,000 hours	7.00
Assembly services	44,00,000	Direct labour hours	11,00,000 hours	4.00
Set-up costs	9,00,000	Machine set-ups	9,000 set-ups	100.00
Order processing	7,20,000	Customer orders	7,200 orders	100.00
Purchasing	4,00,000	Purchase orders	800 orders	500.00

3. Calculation of activity-wise cost

		Products			Total
		X	Y	Z	
A.	Machining hours (Refer Working note-1)	3,00,000	3,20,000	3,00,000	9,20,000
B.	Machine hour rate (₹) (Refer Working note-2)	7	7	7	
C.	Machining services cost (₹) [A×B]	21,00,000	22,40,000	21,00,000	64,40,000
D.	Labour hours (Refer Working note-1)	6,00,000	3,20,000	1,80,000	11,00,000
E.	Labour hour rate (₹) (Refer Working note-2)	4	4	4	
F.	Assembly services cost (₹) [D×E]	24,00,000	12,80,000	7,20,000	44,00,000
G.	Machine set-ups	4,500	3,000	1,500	9,000
H.	Rate per set-up (₹) (Refer Working note-2)	100	100	100	
I.	Set-up cost (₹) [G×H]	4,50,000	3,00,000	1,50,000	9,00,000
J.	Customer orders	2,200	2,400	2,600	7,200
K.	Rate per order (₹) (Refer Working note-2)	100	100	100	
L.	Order processing cost (₹) [J×K]	2,20,000	2,40,000	2,60,000	7,20,000
M.	Purchase orders	300	350	150	800
N.	Rate per order (₹) (Refer Working note-2)	500	500	500	
O.	Purchasing cost (₹) [M×N]	1,50,000	1,75,000	75,000	4,00,000

Q.40

ABC v/s Absorption

RTP Nov



The profit margin of BABY Hairclips Company were over 20% of sales producing BROWN and BLACK hairclips. During the last year, GREEN hairclips had been introduced at 10% premium in selling price after the introduction of YELLOW hairclips earlier five years back at 10/3% premium. However, the manager of the company is disheartened with the sales figure for the current financial year as follows:

During the last year, GREEN hairclips had been introduced at 10% premium in selling price after the introduction of YELLOW hairclips earlier five years back at 10/3% premium. However, the manager of the company is disheartened with the sales figure for the current financial year as follows:

Traditional Income Statement

	Brown	Black	Yellow	Green	Total
Sales	1,50,00,000	1,20,00,000	27,90,000	3,30,000	3,01,20,000
Material Costs	50,00,000	40,00,000	9,36,000	1,10,000	1,00,46,000
Direct Labour	20,00,000	16,00,000	3,60,000	40,000	40,00,000
Overhead (3 times of direct labour)	60,00,000	48,00,000	10,80,000	1,20,000	1,20,00,000
Total Operating Income	20,00,000	16,00,000	4,14,000	60,000	40,74,000
Return on Sales (in %)	13.3%	13.3%	14.8%	18.2%	13.5%

It is a known fact that customers are ready to pay premium amount for YELLOW and GREEN hairclips for their attractiveness; and the percentage returns are also high on new products.

At present, all of the Plant's indirect expenses are allocated to the products at 3 times of the direct labour expenses. However, the manager is interested in allocating indirect expenses on the basis of activity cost to reveal real earner.

He provides support expenses category-wise as follows:

At present, all of the Plant's indirect expenses are allocated to the products at 3 times of the direct labour expenses. However, the manager is interested in allocating indirect expenses on the basis of activity cost to reveal real earner.

He provides support expenses category-wise as follows:

Support Expenses	(₹)
Indirect Labour	40,00,000
Labour Incentives	32,00,000
Computer Systems	20,00,000
Machinery depreciation	16,00,000
Machine maintenance	8,00,000
Energy for machinery	4,00,000
Total	1,20,00,000

He provides following additional information for accomplishment of his interest: Incentives to be allocated @ 40% of labour expenses (both direct and indirect).

Indirect labours are involved mainly in three activities. About half of indirect labour is involved in handling production runs. Another 40% is required just for the physical changeover from one color hairclip to another



because YELLOW hairclips require substantial labour for preparing the machine as compared to other colour hairclips. Remaining 10% of the time is spend for maintaining records of the products in four parts. Another amount spent on computer system of ₹ 20,00,000 is for maintenance of documents relating to production runs and record keeping of the four products. In aggregate, approx.. 80% of the amount expend is involved in the production run activity and approx.. 20% is used to keep records of the products in four parts. Other overhead expenses i.e. machinery depreciation, machine maintenance and energy for machinery are incurred to supply machine capacity to produce all the hairclips (practical capability of 20,000 hours).

Activity Cost Drivers:

Particulars	Brown	Black	Yellow	Green	Total
Sales Volume (units)	1,00,000	80,000	18,000	2,000	2,00,000
Selling Price (₹)	150	150	155	165	
Material cost (₹)	50	50	52	55	
Machine hours per unit (Hrs)	0.10	0.10	0.10	0.10	20,000
Production runs	100	100	76	24	300
Setup time per run (Hrs)	4	1	6	4	

You are required to -

- CALCULATE operating income and operating income as per percentage of sales using activity-based costing system.
- STATE the reasons for different operating income under traditional income system and activity-based costing system.

Ans

- Calculation of operating income using Activity Based Costing

Activity	Overhead cost	Allocation	Overhead cost	Cost-driver level	Cost driver rate
	(₹)		(₹)		(₹)
Indirect labour + 40% for incentives	56,00,000	50%	28,00,000	300 Production runs	9,333.33
		40%	22,40,000	1052* Setup hours	2,129.28
		10%	5,60,000	4 Number of parts	1,40,000
Computer Systems	20,00,000	80%	16,00,000	300 Production runs	5,333.33
		20%	4,00,000	4 Number of parts	1,00,000
Machinery depreciation	16,00,000	100%	16,00,000	20,000 Machine hours	80
Machine Maintenance	8,00,000	100%	8,00,000	20,000 Machine hours	40
Energy for Machinery	4,00,000	100%	4,00,000	20,000 Machine hours	20

$$\begin{aligned}
 & * (100 \times 4) + (100 \times 1) + (76 \times 6) + (24 \times 4) \\
 & = (400 + 100 + 456 + 96) \\
 & = 1052 \text{ setup hours}
 \end{aligned}$$

Activity Based Costing

	Brown	Black	Red	Green	Total
--	-------	-------	-----	-------	-------

Quantity (units)	1,00,000	80,000	18,000	2,000	2,00,000
	(₹)	(₹)	(₹)	(₹)	(₹)
Sales	1,50,00,000	1,20,00,000	27,90,000	3,30,000	3,01,20,000
Less: Material Costs	50,00,000	40,00,000	9,36,000	1,10,000	1,00,46,000
Less: Direct labour	20,00,000	16,00,000	3,60,000	40,000	40,00,000
Less: 40% Incentives on direct labour	8,00,000	6,40,000	1,44,000	16,000	16,00,000
(A)	72,00,000	57,60,000	13,50,000	1,64,000	1,44,74,000
Overheads					
Indirect labour + incentives					
- 50% based on Production runs	9,33,333 (9,333.33 × 100)	9,33,333 (9,333.33 × 100)	7,09,334 (9,333.33 × 76)	2,24,000 (9,333.33 × 24)	28,00,000
- 40% based	8,51,711	2,12,928	9,70,951	2,04,410	22,40,000
- On Setp hours	(2,129.28 × 400)	(2,129.28 × 100)	(2,129.28 × 456)	(2,129.28 × 96)	
- 10% based on number of parts	1,40,000 (1,40,000 × 1)	1,40,000	1,40,000	1,40,000	5,60,000
Computer Systems					
- 80% based on Production runs	5,33,333 (5,333.33 × 100)	5,33,333 (5,333.33 × 100)	4,05,334 (5,333.33 × 76)	1,28,000 (5,333.33 × 24)	16,00,000
- 20% based on number of parts	1,00,000 (1,00,000 × 1)	1,00,000	1,00,000	1,00,000	4,00,000
Machinery depreciation	8,00,000 (80 × 0.1 × 1,00,000)	6,40,000 (80 × 0.1 × 80,000)	1,44,000 (80 × 0.1 × 18,000)	16,000 (80 × 0.1 × 2,000)	16,00,000
Machine Maintenance	4,00,000 (40 × 0.1 × 1,00,000)	3,20,000 (40 × 0.1 × 80,000)	72,000 (40 × 0.1 × 18,000)	8,000 (40 × 0.1 × 2,000)	8,00,000
Energy for Machinery	2,00,000 (20 × 0.1 × 1,00,000)	1,60,000 (20 × 0.1 × 80,000)	36,000 (20 × 0.1 × 18,000)	4,000 (20 × 0.1 × 2,000)	4,00,000
Total Overheads (B)	39,58,377	30,39,594	25,77,619	8,24,410	1,04,00,000
Operating Income (A-B)	32,41,623	27,20,406	(12,27,619)	(6,60,410)	40,74,000
Return on Sales (%)	21.61	22.67	(44.00)	(200.12)	13.53



- (ii) The difference in the operating income under the two systems is due to the differences in the overheads borne by each of the products. The Activity Based Costs appear to be more accurate.

Q.41

ABC v/s Absorption

MTP Nov



BABYSOFT is a global brand created by Bio-organic Ltd. The company manufactures three range of beauty soaps i.e. BABYSOFT- Gold, BABYSOFT- Pearl, and BABYSOFT- Diamond. The budgeted costs and production for the month of December, 2019 are as follows:

	BABYSOFT- Gold		BABYSOFT- Pearl		BABYSOFT- Diamond	
Production of soaps (Units)	4,000		3,000		2,000	
Resources per Unit:	Qty	Rate	Qty	Rate	Qty	Rate
- Essential Oils	60 ml	₹ 200 / 100 ml	55 ml	₹ 300 / 100 ml	65 ml	₹ 300 / 100 ml
- Cocoa Butter	20 g	₹ 200 / 100 g	20 g	₹ 200 / 100 g	20 g	₹ 200 / 100 g
- Filtered Water	30 ml	₹ 15 / 100 ml	30 ml	₹ 15 / 100 ml	30 ml	₹ 15 / 100 ml
- Chemicals	10 g	₹ 30 / 100 g	12 g	₹ 50 / 100 g	15 g	₹ 60 / 100 g
- Direct Labour	30 minutes	₹ 10 / hour	40 minutes	₹ 10 / hour	60 minutes	₹ 10 / hour

Bio-organic Ltd. followed an Absorption Costing System and absorbed its production overheads, to its products using direct labour hour rate, which were budgeted at ₹ 1,98,000.

Now, Bio-organic Ltd. is considering adopting an Activity Based Costing system. For this, additional information regarding budgeted overheads and their cost drivers is provided below:

Particulars	(₹)	Cost drivers
Forklifting cost	58,000	Weight of material lifted
Supervising cost	60,000	Direct labour hours
Utilities	80,000	Number of Machine operations

The number of machine operators per unit of production are 5, 5, and 6 for BABYSOFT - Gold, BABYSOFT- Pearl, and BABYSOFT- Diamond respectively.

(Consider (i) Mass of 1 litre of Essential Oils and Filtered Water equivalent to 0.8 kg and 1 kg respectively (ii) Mass of output produced is equivalent to the mass of input materials taken together.)

You are requested to:

- PREPARE a statement showing the unit costs and total costs of each product using the absorption costing method.
- PREPARE a statement showing the product costs of each product using the ABC approach. (iii) STATE what are the reasons for the different product costs under the two approaches?

Ans

(i)

Traditional Absorption Costing

	BABY SO - Gold	BABYSOFT- Pearl	BABYSOFT- Diamond	Total
(a) Production of soaps (units)	4,000	3,000	2,000	9,000
(b) Direct labour (minutes)	30	40	60	-
(c) Direct labour hours (cxb)/60 minutes	2,000	2,000	2,000	6,000

Overhead rate per direct labour hour:

= Budgeted overheads ÷ Budgeted labour hours

= 1,98,000 ÷ 6,000 hours

= 33 per direct labour hour

Unit Costs:

	BABYSOFT- Gold (₹)	BABYSOFT- Pearl (₹)	BABYSOFT- Diamond (₹)
Direct Costs:			
- Direct Labour	5.00	6.67	10.00
	$\left(\frac{10 \times 30}{60}\right)$	$\left(\frac{10 \times 40}{60}\right)$	$\left(\frac{10 \times 60}{60}\right)$
- Direct Material	167.50	215.50	248.50
(Refer working note1)			
Production Overhead:	16.50	22.00	33.00
	$\left(\frac{33 \times 30}{60}\right)$	$\left(\frac{33 \times 40}{60}\right)$	$\left(\frac{33 \times 60}{60}\right)$
Total unit costs	189.00	244.17	291.50
Number of units	4,000	3,000	2,000
Total costs	7,56,000	7,32,510	5,83,000

Working note-1

Calculation of Direct material cost

	BABYSOFT- Gold (₹)	BABYSOFT- Pearl (₹)	BABYSOFT- Diamond (₹)
Essential oils	120.00	165.00	195.00
	$\left(\frac{200 \times 60}{100}\right)$	$\left(\frac{300 \times 55}{100}\right)$	$\left(\frac{300 \times 65}{100}\right)$
Cocoa Butter	40.00	40.00	40.00
	$\left(\frac{200 \times 20}{100}\right)$	$\left(\frac{200 \times 20}{100}\right)$	$\left(\frac{200 \times 20}{100}\right)$
Filtered water	4.50	4.50	4.50
	$\left(\frac{15 \times 30}{100}\right)$	$\left(\frac{15 \times 30}{100}\right)$	$\left(\frac{15 \times 30}{100}\right)$
Chemicals	3.00	6.00	9.00
	$\left(\frac{30 \times 10}{100}\right)$	$\left(\frac{50 \times 12}{100}\right)$	$\left(\frac{60 \times 15}{100}\right)$
Total costs	167.50	215.50	248.50

(ii) Activity Based Costing

	BABYSOFT- Gold	BABYSOFT- Pearl	BABYSOFT- Diamond	Total
Quantity(units)	4,000	3,000	2,000	-
Weight per unit (grams)	108 {(60×0.8)+20+30+10}	106 {(55×0.8)+20+30+12}	117 {(65×0.8)+20+30+15}	-



Total weight(gm)	4,32,000	3,18,000	2,34,000	9,84,000
Direct labour (minutes)	30	40	60	-
Direct labour hours	2,000 $\left(\frac{4,000 \times 30}{60}\right)$	2,000 $\left(\frac{3,000 \times 40}{60}\right)$	2,000 $\left(\frac{2,000 \times 60}{60}\right)$	6,000
Machine operations per unit	5	5	6	-
Total Operations	20,000	15,000	12,000	47,000

Forklifting rate per gram = $58,000 \div 9,84,000$ grams
 = 0.06 per gram

Supervising rate per direct labour hour = $60,000 \div 6,000$ hours = 10 per labour hour

Utilities rate per machine operations = $80,000 \div 47,000$ machine operations
 = 1.70 per machine operations

Unit Costs under ABC:

	BABYSOFT- Gold (₹)	BABYSOFT- Pearl (₹)	BABYSOFT- Diamond (₹)
Direct Costs:			
- Direct Labour	5.00 167.50	6.67 215.50	10.00 248.50
- Direct material			
Production Overheads:			
Forklifting cost	6.48 (0.06 × 108)	6.36 (0.06 × 106)	7.02 (0.06 × 117)
Supervising cost	5.00 $\left(\frac{10 \times 30}{60}\right)$	6.67 $\left(\frac{10 \times 40}{60}\right)$	10.00 $\left(\frac{10 \times 60}{60}\right)$
Utilities	8.50 (1.70 × 5)	8.50 (1.70 × 5)	10.20 (1.70 × 6)
Total unit costs	192.48	243.70	285.72
Number of units	4,000	3,000	2,000
Total costs	7,69,920	7,31,100	5,71,440

(iii) Comments: The difference in the total costs under the two systems is due to the differences in the overheads borne by each of the products. The Activity Based Costs appear to be more precise.

Q.42

Unused Capacity

RTP May



MST Limited has collected the following data for its two activities. It calculates activity cost rates based on cost driver capacity.

Activity	Cost Driver	Capacity	Cost (₹)
Power	Kilowatt hours	50,000 kilowatt hours	40,00,000

Quality Inspections	Number of Inspections	10,000 Inspections	60,00,000
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The company makes three products M, S and T. For the year ended March 31, 20X 9, the following consumption of cost drivers was reported:

Product	Kilowatt hours	Quality Inspections
M	10,000	3,500
S	20,000	2,500
T	15,000	3,000

Required:

- PREPARE a statement showing cost allocation to each product from each activity.
- CALCULATE the cost of unused capacity for each activity.
- STATE the factors the management considers in choosing a capacity level to compute the budgeted fixed overhead cost rate.

Ans

- Statement of cost allocation to each product from each activity

	Product			
	M (₹)	S (₹)	T (₹)	Total (₹)
Power (Refer to working note)	8,00,000 (10,000 kWh × ₹80)	16,00,000 (20,000 kWh × ₹80)	12,00,000 (15,000 kWh × ₹80)	36,00,000
Quality Inspections (Refer to working note)	21,00,000 (3,500 inspections × ₹600)	15,00,000 (2,500 inspections × ₹600)	18,00,000 (3,000 inspections × ₹600)	54,00,000

Working Note:

Rate per unit of cost driver:

Power : (₹40,00,000 ÷ 50,000 kWh) = ₹80/kWh

Quality Inspection : (₹60,00,000 ÷ 10,000 inspections) = ₹600 per inspection

- Calculation of cost of unused capacity for each activity:

	(₹)
Power (₹40,00,000 - ₹36,00,000)	4,00,000
Quality Inspections (₹60,00,000 - ₹54,00,000)	6,00,000
Total cost of unused capacity	10,00,000

- Factors management consider in choosing a capacity level to compute the budgeted fixed overhead cost rate:

- Effect on product costing & capacity management
- Effect on pricing decisions.
- Effect on performance evaluation
- Effect on financial statements
- Regulatory requirements.
- Difficulties in forecasting for any capacity level.

**6****CHAPTER****MARGINAL COSTING****Q.43**

BEP Units & Sales for fixed

PY May 19



M/s Gaurav Private Limited is manufacturing and selling two products: 'BLACK' and 'WHITE' at selling price of ₹ 20 and ₹ 30 respectively.

The following sales strategy has been outlined for the financial year 2019-20:

- (i) Sales planned for the year will be ₹ 81,00,000 in the case of 'BLACK' and ₹ 54,00,000 in the case of 'WHITE'.
- (ii) The selling price of 'BLACK' will be reduced by 10% and that of 'WHITE' by 20%.
- (iii) Break-even is planned at 70% of the total sales of each product.
- (iv) Profit for the year to be maintained at ₹ 8,26,200 in the case of 'BLACK' and ₹ 7,45,200 in the case of 'WHITE'. This would be possible by reducing the present annual fixed cost of ₹ 42,00,000 allocated as ₹ 22,00,000 to 'BLACK' and ₹ 20,00,000 to 'WHITE'.

You are required to calculate:

- (1) Number of units to be sold of 'BLACK' and 'WHITE' to Break even during the financial year 2019-20.
- (2) Amount of reduction in fixed cost product-wise to achieve desired profit mentioned at (iv) above.

Ans

- (i) Statement showing Break Even Sales

Particulars	Black	White
Sales Planned	81,00,000	54,00,000
Selling Price (₹)	18	24
Number of Units to be sold	4,50,000	2,25,000
Break Even sales (in Units), 70% of total sales	3,15,00	1,57,500
Or		
Break Even sales (in ₹), 70% of total sales	56,70,00	37,80,000

- (ii) Statement Showing Fixed Cost Reduction

Profit to be maintained (₹)	8,26,200	7,45,200
Margin of Safety (70% of Sales) (₹)	24,30,000	16,20,000
PVR (Profit/ Margin of Safety) × 100	34%	46%
Contribution (Sales × 34% or 46%) (₹)	27,54,000	24,84,000
Less: Profit (₹)	8,26,200	7,45,200
Revised Fixed Cost (₹)	19,27,80	17,38,800
Present Fixed Cost (₹)	22,00,000	20,00,000
Reduction in Fixed Cost	2,72,20	2,61,200

Q.44

Calculate lowest Sp

PY Nov 19



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 Overhead ₹ 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 has earned in the current year?

Ans

Selling Price = ₹ 500 Profit = ₹ 125 No of Sticks = 5,000

Particular	Current Year (₹)	Next Year (₹)
Direct Material	150	157.50 (150 + 5%)
Direct Wages	50	60 (50+20%)
Works Overheads	62.50 (125 × 50%)	62.5
Selling Expenses	12.50 (50 × 25%)	12.5
Total Variable Cost	275	292.50
Fixed Cost (62.5 × 5,000) = 3,12,500; (37.5 × 5,000) = 1,87,500	5,00,000	5,50,000

Let: Lowest Price Quoted = K

Now, Sales = Target Profit (5,000 units × ₹ 125) + Variable Cost + Fixed Cost Or, = (5,000 × 500) + (2,000 × K) = 6,25,000 + 20,47,500 + 5,50,000 Or, K = ₹ 361.25

So, Lowest Price that can be quoted to earn the profit of ₹ 6,25,000 (same as current year) is ₹ 361.25

Q.45

Best Product Mix

PY Nov 20



Moon Ltd. produces products 'X', 'Y' and 'Z' and has decided to analyse its production mix in respect of these three products - 'X', 'Y' and 'Z'.

You have the following information :

	X	Y	Z
Direct Materials ₹ (per unit)	160	120	80



Variable Overheads ₹ (per unit) 8 20 12
 Direct labour :

Departments:	Rate per Hour (₹)	Hours per unit	Hours per unit	Hours per unit
		X	Y	Z
Department-A	4	6	10	5
Department-B	8	6	15	11

From the current budget, further details are as below :

	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 a constraint on supply of labour in Department-A and its manpower cannot be increased beyond its present level.

Required:

- Identify the best possible product mix of Moon Ltd.
- Calculate the total contribution from the best possible product mix.

Ans

- Statement Showing "Calculation of Contribution/ unit"

Particulars	X (₹)	Y (₹)	Z (₹)
Selling Price (A)	312	400	240
Variable Cost:			
Direct Material	160	120	80
Direct Labour			
Dept. A (Rate x Hours)	24	40	20
Dept. B (Rate x Hours)	48	120	88
Variable Overheads	8	20	12
Total Variable Cost (B)	240	300	200
Contribution per unit (A - B)	72	100	40
Hours in Dept. A	6	10	5
Contribution per hour	12	10	8
Rank	I	II	III

Existing Hours = 10,000 × 6hrs. + 12,000 × 10 hrs. + 20,000 × 5 hrs. = 2,80,000 hrs. Best possible product mix (Allocation of Hours on the basis of ranking)

Produce 'X'	=	12,000 units
Hours Required	=	72,000 hrs (12,000 units × 6 hrs.)
Balance Hours Available	=	2,08,000 hrs (2,80,000 hrs. - 72,000 hrs.)
Produce 'Y' (the Next Best)	=	16,000 units
Hours Required	=	1,60,000 hrs (16,000 units × 10 hrs.)

Balance Hours Available = 48,000 hrs (2,08,000 hrs. - 1,60,000 hrs.)
 Produce 'Z' (balance) = 9,600 units (48,000 hrs./ 5 hrs.)

(ii) Statement Showing "Contribution"

Product	Units	Contribution/ Unit (₹)	Total Contribution (₹)
X	12,000	72	8,64,000
Y	16,000	100	16,00,000
Z	9,600	40	3,84,000
Total			28,48,000

Q.46

Fixed Cost, Sales, BEP

PY Jan 21



During a particular period ABC Ltd has furnished the following data: Sales ₹ 10,00,000

Contribution to sales ratio 37% and 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:

- Revised Fixed Cost.
- Revised Sales and
- New Break-Even Point.

Ans

(a) 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 = $\frac{6,30,000}{70\%} = 9,00,000$

Revised, Break-even sales ratio = 100% - 40% (revised Margin of safety) = 60%

(i) Revised fixed cost = revised breakeven sales × revised contribution to sales ratio

(ii) Revised sales = ₹ 9,00,000 (as calculated above)

(iii) Revised Break-even point = Revised sales × Revised break-even sales ratio

= ₹ 9,00,000 × 60%

= ₹ 5,40,000

Q.47

BE Sales, Sales t/O

PY Jan 21



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:



- (i) Break-Even sales of the merged plant and the capacity utilization at that stage.
- (ii) Profitability of the merged plant at 80% capacity utilization.
- (iii) Sales Turnover of the merged plant to earn a profit of ₹ 60,00,000.
- (iv) 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.

Ans**Workings:**

1. Statement showing computation of Breakeven of merged plant and other required information

S.No.	Particulars	Plan A		Plant B		Merged Plant (100%) (₹)
		Before (90%) (₹)	After (100%)(₹)	Before (60%) (₹)	After (100%) (₹)	
(i)	Sales	63,00,000	70,00,000	48,00,000	80,00,000	1,50,00,000
(ii)	Variable cost	39,60,000	44,00,000	22,50,000	37,50,000	81,50,000
(iii)	Contribution (i - ii)	23,40,000	26,00,000	25,50,000	42,50,000	68,50,000
(iv)	Fixed Cost	13,00,000	13,00,000	15,00,000	15,00,000	28,00,000
(v)	Profit (iii - iv)	10,40,000	13,00,000	10,50,000	27,50,000	40,50,000

- $$2 \text{ PV ratio of merged plant} = \frac{\text{Contribution}}{\text{Sales}} \times 100$$
- $$= \frac{68,50,000}{1,50,00,000} \times 100 = 45.67\%$$
- $$(i) \text{ Break even sales of merged plant} = \frac{\text{Fixed Cost}}{\text{P/V Ratio}}$$
- $$= \frac{28,00,000}{45.67\%}$$
- $$= 61,30,939.34 \text{ (approx.)}$$
- $$\text{Capacity utilisation} = \frac{61,30,939.34}{1,50,00,000} \times 100 = 40.88\%$$
- $$(ii) \text{ Profitability of the merged plant at 80\% capacity utilisation}$$
- $$= (1,50,00,000 \times 80\%) \times \text{P/v ratio} - \text{fixed cost}$$
- $$= 1,20,00,000 \times 45.67\% - 28,00,000$$
- $$(iii) \text{ Sales to earn a profit of ₹ 60,00,000}$$
- $$\text{Desired sales} = \frac{\text{Fixed Cost} + \text{desired profit}}{\text{P/V Ratio}}$$
- $$= \frac{28,00,000 + 60,00,000}{45.67\%}$$
- $$= ₹ 1,92,68,666 \text{ (approx.)}$$
- $$(i) \text{ Increase in fixed cost}$$
- $$= ₹ 28,00,000 \times 5\% = ₹ 1,40,000$$
- $$\text{Therefore, percentage increase in sales price}$$
- $$= \frac{1,40,000}{1,92,68,666} \times 100 = 0.726\% \text{ (approx.)}$$

Q.48

BEP/ Cost Indifference

PY July 21



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:

	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 Point in units. Interpret your results.
- (2) The Break-even Point of each method in terms of units.

Ans

(i) Cost Indifference Point

	Method-1 and Method-2 (₹)
Differential Fixed Cost (I)	2,00,000 (3,00,000 - 1,00,000)
Differential Variable Costs (II)	5 (15 - 10)
Cost Indifference Point (I/II) (Differential Fixed Cost / Differential Variable Costs per unit)	40,000

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.

No. of Product	Alternative to be Chosen
Product $\leq$ 40,000 units	Method-1, Semi-Automatic
Product $\geq$ 40,000 units	Method-2, Automatic

(ii) Break Even point (in units)

	Method-1	Method-2
BEP (in units) = $\frac{\text{Fixed cost}}{\text{Contribution per unit}}$	$\frac{1,00,000}{(25-15)} = 10,000$	$\frac{3,00,000}{(25-10)} = 20,000$

Q.49

Fixed Cost/ BEP

PY May 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:

- Total fixed cost incurred by UV Ltd. per quarter.
- Break Even sales value (in rupees)
- Calculate Profit, if the sale volume reaches 50,000 units in the next quarter (i.e., quarter ending on 30th June, 2022).

Ans

	Quarter ending 31st December, 2021 (₹)	Quarter ending 31st March, 2022 (₹)
Sales (No. of units sold x ₹ 450 per unit)	54,00,000	1,35,00,000
Profit (Loss)	(4,20,000) [12,000 × 35]	12,00,000 [30,000 × 40]

$$P/V \text{ Ratio} = \frac{\text{Change in Profit}}{\text{Change in Sales}} \times 100$$

$$\therefore \frac{16,20,000}{81,00,000} \times 100 = 20\%$$

- Fixed Cost = Sales × P/V ratio - profit

$$= 1,35,00,000 \times 20\% - 12,00,000$$

$$= 15,00,000$$

Alternative Presentation for the calculation of Fixed cost

	Quarter ending 31st December, 2021 (₹)	Quarter ending 31st March, 2022 (₹)
Sales (No. of units sold x ₹ 450 per unit)	54,00,000	1,35,00,000
Profit (Loss)	(4,20,000) [12,000 × 35]	12,00,000 [30,000 × 40]
Total cost	58,20,000	1,23,00,000

$$VC \text{ per unit} = (1,23,00,000 - 58,20,000) / (30,000 - 12,000)$$

$$= 64,80,000 / 18,000 = 360 \text{ per unit}$$

$$\text{Fixed cost TC} - VC \text{ 58,20,000 (360} \times 12,000 \text{ units) 15,00,000}$$

- Break even sales value (in Rupees) = $\frac{\text{Fixed Cost}}{P/V \text{ ratio}} \times 100$

$$= \frac{15,00,000}{20\%} = 75,00,000$$

- Profit, if sales reach 50,000 units for the quarter ending 30th June, 2022

	(₹)
Sales (50,000 × ₹ 450)	2,25,00,000
Less: Variable cost	1,80,00,000

Contribution	45,00,000
Less: Fixed cost	15,00,000
Profit	30,00,000

Q.50

Cup Analysis

PY Nov 22



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:

	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:

Crop	Labour charges	Packing Materials	Other variable expenses
Wheat	8	2	4
Rice	10	2	1
Maize	120	10	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:

Crop	Maximum Area (in hectares)	Minimum Area (in hectares)
Wheat	160	100
Rice	50	40
Maize	60	10

You are required to:

- Rank the crops on the basis of contribution per hectare.
 - Determine the optimum product mix considering that all the three cereals are to be produced.
 - Calculate the maximum profit which can be achieved if the total fixed cost per annum is ₹ 21,45,000. (10 Marks)
- (Assume that there are no other constraints applicable to this company)

Ans

- Statement showing Ranking of crops on the basis of Contribution per hectare

Sl. No	Particulars	Wheat	Rice	Maize
(I)	Sales price per kg (₹)	20	40	250
(II)	Variable cost* per kg (₹)	14	13	150
(III)	Contribution per kg (₹)	6	27	100
(IV)	Yield (in kgs per hectare)	2,000	500	100
(V)	Contribution per hectare (₹)	12,000	13,500	10,000
(VI)	Ranking	II	I	III

*Variable cost = Labour Charges + Packing Material + Other Variable Expenses

Therefore, to maximize profits, the order of priority of production would be Rice, Wheat and Maize.

(ii) & (iii) Statement showing optimum product mix considering that all the three cereals are to be produced and maximum profit thereof



Sl. No.	Particulars	Wheat	Rice	Maize	Total
(i)	Minimum Area (in hectare)	100	40	10	150
(ii)	Remaining area (in hectare)				60
(iii)	Distribution of remaining area based on ranking considering Maximum area	50	10	-	60
(iv)	Optimum mix (in hectare)	150	50	10	210
(v)	Contribution per hectare (₹)	12,000	13,500	10,000	
(vi)	Total contribution (₹)	18,00,000	6,75,000	1,00,000	25,75,000
(vii)	Fixed cost (₹)				21,45,000
(viii)	Maximum Profit (₹)				4,30,000

Optimum Product Mix and calculation of maximum profit earned by company can also be presented as below

(ii) Optimum Product Mix:

Particular	Area (in hectares)	Yield (kg per hectare)	Total Production (in kgs)
(a) Maximum of Rice	50	500	25000
(b) Minimum of Maize	10	100	1000
(c) Balance of Wheat	150	2000	300000
	210		326000

(iii) Calculation of maximum profit earned by the company:

	Production (in kgs)	Contribution (₹ per kg)	Total contribution (₹)
(a) Rice	25,000	24	6,75,000
(b) Maize	1,000	100	1,00,000
(c) Wheat	3,00,000	6	18,00,000
Total contribution			25,75,000
Less: Total Fixed Cost per annum			(21,45,000)
Maximum profits earned by the company			4,30,000

Q.51

Compute best option

RTP May 18



A company manufactures two types of herbal product, A and B. Its budget shows profit figures after apportioning the fixed joint cost of ₹15 lacs in the proportion of the numbers of units sold. The budget for 2018, indicates:

	A	B
Profit (₹)	1,50,000	30,000
Selling Price / unit (₹)	200	120

P/V Ratio (%)	40	50
---------------	----	----

Required:

COMPUTE the best option among the following, if the company expects that the number of units to be sold would be equal.

- Due to exchange in a manufacturing process, the joint fixed cost would be reduced by 15% and the variables would be increased by $7\frac{1}{2}\%$.
- Price of A could be increased by 20% as it is expected that the price elasticity of demand would be unity over the range of price.
- Simultaneous introduction of both the option, viz, (i) and (ii) above.

Ans

Option (i)

Increase in profit when due to change in a manufacturing process there is reduction in joint fixed cost and increase in variable costs.

	(₹)
Revised Contribution from 12,000 units of A due to 7.5% increase in Variable Cost {12,000 units × (₹200 - ₹129)}	8,52,000
Revised Contribution from 12,000 units of B due to 7.5% increase in Variable Cost {12,000 units × (₹120 - ₹64.50)}	6,66,000
Total Revised Contribution	15,18,000
Less: Fixed Cost (₹15,00,000 - 15% × ₹15,00,000)	12,75,000
Revised Profit	2,43,000
Less: Existing Profit	1,80,000
Increase in Profit	63,000

Option (ii)

Increase in profit when the price of product A increased by 20% and the price elasticity of its demand would be unity over the range of price.

	(₹)
Budgeted Revenue from Product A (12,000 units × ₹200)	24,00,000
Revised Demand (in units) (₹24,00,000 / ₹240)	10,000
Revised Contribution (in ₹) [10,000 units × (₹240 - ₹120)]	12,00,000
Less: Existing Contribution (12,000 units × ₹80)	9,60,000
Increase in Profit (Contribution)	2,40,000

*Note: Since Price Elasticity of Demand is 1, therefore the Revenue in respect of Products will remain same.

Option (iii)

Increase in profit on the simultaneous introduction of above two options.

	(₹)
Revised Contribution from Product A [10,000 units × (₹240 - ₹129)]	11,10,000
Revised Contribution from Product B [12,000 units × (₹120 - ₹64.50)]	6,66,000
Total Revised Contribution	17,76,000
Less: Revised Fixed Cost	12,75,000
Revised Profit	5,01,000
Less: Existing Profit	1,80,000
Increase in Profit	3,21,000

A comparison of increase in profit figures under above three options clearly indicates that the option (iii) is the best as it increases the profit of the concern by ₹3,21,000.

Note: The budgeted profit / (loss) for 2018 in respect of products A and B should be ₹ 2,10,000 and (₹30,000) respectively instead of ₹ 1,50,000 and ₹ 30,000.

**Workings**

1. Contribution per unit of each product:

	Product	
	A (₹)	B (₹)
Contribution per unit	80	60
(Sales × P/V Ratio)	(₹200 × 40%)	(₹120 × 50%)

2. Number of units to be sold:

$$\text{Total Contribution} - \text{Fixed Cost} = \text{Profit}$$

Let x be the number of units of each product sold, therefore:

$$(80x + 60x) - ₹15,00,000 = ₹1,50,000 + ₹30,000$$

$$\text{Or } x = 12,000 \text{ units}$$

Q.52

BEP/ Mos/Sales for profit

RTP May



A Ltd. manufacture and sales its product R-9. The following figures have been collected from cost records of last year for the product R-9:

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 & Distribution Overhead	4% of Cost of Sales	₹ 68,000

Last Year 5,000 units were sold at ₹185 per unit. From the given DETERMINE the followings:

- Break-even Sales (in rupees)
 - Profit earned during last year
 - Margin of safety (in %)
 - Profit if the sales were 10% less than the actual sales.
- (Assume that Administration Overhead is related with production activity)

Ans

- (1) Calculation of Cost of Goods Sold (COGS):

$$\text{COGS} = \text{DM} + \text{DL} + \text{FOH} + \text{AOH}$$

$$\text{COGS} = \{0.3 \text{ COGS} + 0.15 \text{ COGS} + (0.10 \text{ COGS} + ₹ 2,30,000) + (0.02 \text{ COGS} + ₹ 71,000)\}$$

$$\text{Or, COGS} = 0.57 \text{ COGS} + ₹ 3,01,000$$

$$\text{Or, COGS} = \frac{3,01,000}{0.43} = ₹ 7,00,000$$

- (2) Calculation of Cost of Sales (COS):

$$\text{COS} = \text{COGS} + \text{S\&DOH}$$

$$\text{COS} = \text{COGS} + (0.04 \text{ COS} + ₹ 68,000)$$

$$\text{Or, COS} = ₹ 7,00,000 + (0.04 \text{ COS} + ₹ 68,000)$$

$$\text{Or, COS} = \frac{7,68,000}{0.96} = ₹ 8,00,000$$

- (3) Calculation of Variable Costs:

Direct Material-	(0.30 × ₹ 7,00,000)	₹ 2,10,000
Direct Labour-	(0.15 × ₹ 7,00,000)	₹ 1,05,000
Factory Overhead-	(0.10 × ₹ 7,00,000)	₹ 70,000
Administration OH-	(0.02 × ₹ 7,00,000)	₹ 14,000
Selling & Distribution OH	(0.04 × ₹ 8,00,000)	₹ 32,000

- (4) Calculation of total Fixed Costs:

Factory Overhead-	₹ 2,30,000
Administration OH-	₹ 71,000
Selling & Distribution OH	₹ 68,000
	<u>₹ 3,69,000</u>

- (5) Calculation of P/V Ratio:

$$\begin{aligned} \text{P/V Ratio} &= \frac{\text{Contribution}}{\text{Sales}} \times 100 = \frac{\text{Sales} - \text{Variable Costs}}{\text{Sales}} \times 100 \\ &= \frac{(185 \times 5,000 \text{ units}) - 4,31,000}{185 \times 5,000 \text{ units}} \times 100 = 53.41\% \end{aligned}$$

- (i) Break-Even Sales

$$\frac{\text{Sales} - \text{Breakeven sales}}{\text{Sales}} = \frac{3,69,000}{53.41\%} = ₹6,90,882$$

- (ii) Profit earned during the last year

$$\begin{aligned} &= (\text{Sales} - \text{Total Variable Costs}) - \text{Total Fixed Costs} \\ &= (₹9,25,000 - ₹4,31,000) - ₹3,69,000 \\ &= ₹1,25,000 \end{aligned}$$

- (iii) Margin of Safety (%)

$$\begin{aligned} &= \frac{\text{Fixed Costs}}{\text{P/V Ratio}} \times 100 \\ &= \frac{9,25,000 - 6,90,882}{9,25,000} \times 100 = 25.31\% \end{aligned}$$

- (iv) Profit if the sales were 10% less than the actual sales:

$$\begin{aligned} \text{Profit} &= 90\% (₹9,25,000 - ₹4,31,000) - ₹3,69,000 \\ &= ₹4,44,600 - ₹3,69,000 = ₹75,600 \end{aligned}$$

Q.53

Break even point

RTP May 23



The following data are available from the budget records of Finesign Women's Handbag Company for the forthcoming budget period.

	₹
Selling Price per unit	1000
Variable cost per unit:	
Cost of Material used	750.00
Sales commission	50.00
Total Variable Cost	800.00
Annual fixed expenses:	
Rent	7,00,000
Salaries	11,00,000
Other fixed expenses	5,00,000
Total Fixed Cost	23,00,000

Although the firm manufactures Bags with different styles, they have identical purchase costs and selling price.
Requirement:

- (a) What is the annual break-even point both in terms of units and value?
(b) If the store manager is paid 1 per cent commission on sales, what would be the annual break-even point



both in terms of units and value?

- (c) If the firm decides to pay a fixed salary of ₹ 9,00,000 in lieu of sales commission, what would be the annual break-even point in terms of units and value. Considering break-even point in requirement (a), If the stores manager is paid 2 per cent commission on each bag sold in excess of the break-even point, what would be the profit if 20000 bags were sold.

Ans

$$(a) \text{ P/V ratio: } \frac{\text{Sales per unit} - \text{Variable Cost per unit}}{\text{Selling price per unit}} \times 100$$

$$= \frac{1000 - 800}{1000} \times 100$$

$$= \frac{200}{1000} \times 100 = 20\%$$

$$\text{Annual BEP in units: } \frac{\text{Annual fixed cost}}{\text{Contribution per unit}}$$

$$= \frac{23,00,000}{200} = 11,500 \text{ units}$$

$$\text{Annual BEP in value: } \frac{\text{Annual fixed cost}}{\text{P / V ratio}}$$

$$\frac{23,00,000}{20\%} = ₹1,15,00,000$$

- (b) Revised P/V ratio and BEP :
commission on sales per unit = 1% of 1,000 = ₹10

$$\text{So, P/V ratio: } \frac{1000 - (750 + 50 + 10)}{1000}$$

$$= \frac{190}{1000} \times 100 = 19\%$$

$$\text{BEP in terms of units: } \frac{\text{Annual fixed cost}}{\text{Contribution per unit}}$$

$$= \frac{29,00,000}{190} = 12,106 \text{ units}$$

$$\text{BEP in terms of value: } \frac{\text{Annual fixed cost}}{\text{P / V}}$$

$$\frac{23,00,000}{19\%} = ₹1,21,05,263$$

- (c) Break-even point under fixed salary plan:

$$\text{P/V ratio} = \frac{\text{Contribution per unit}}{\text{Selling price per unit}} = \frac{1000 - 750}{1000} \times 100 = \frac{250}{1000} \times 100 = 25\%$$

Revised fixed cost

Original fixed cost	₹ 23,00,000
Proposed fixed salary	₹ 9,00,000
Total	₹ 32,00,000

$$\text{BEP in terms of units: } \frac{\text{Annual fixed cost}}{\text{Contribution per unit}} = \frac{32,00,000}{250} = 12,800 \text{ units}$$

$$\text{BEP in terms of value: } \frac{\text{Annual fixed cost}}{\text{P / v ratio}} = \frac{32,00,000}{25\%} = 1,28,00,000$$

- (d) Annual break-even point under requirement (a) is 11,500 units.
 Margin of safety at sales volume of 20,000 unit of bags (20,000 - 11,500) = 8500 units
 Contribution on sales beyond break-even sales:
 Revised contribution per unit: 200 - (2% of 1000) = 180
 Profit = Margin of safety (in units) × Contribution per unit
 = 8500 × 180 = ₹ 15,30,000

Q.54

PY Nov 23



R Ltd. produces and sells 60,000 units of product 'AN', at its Noida Plant. The selling price of the product is ₹ 15 per unit. The variable cost is 80% of selling price per unit. Fixed cost during this period is ₹ 4,20,000. The company is continuously suffering losses, and management plans to shut down the Noida Plant. The fixed cost is expected to be reduced by ₹ 2,50,000. Additional costs of plant shut down are expected at ₹ 25,000. You are required to comment on:

- Whether the Noida plant be shut down?
- Find the shut-down point in units.

Ans.
Statement of profit

Particulars	₹
Selling Price	15 per unit
Less : Variable cost	12 per unit
Contribution	3 per unit
Capacity	60,000 units
Total contribution (60,000 units × ₹ 3)	1,80,000
Less: Fixed Cost	4,20,000
Loss	(2,40,000)

Shut down cost

Particular	₹
Fixed cost	1,70,000
Additional cost	25,000
Shut down cost	1,95,000

- (i) Since the loss of Noida plant exceeds shut down cost it is better to shut down the plant.

(ii) Shut down point:
$$\frac{\text{Total fixed cost} - \text{Shut down cost}}{\text{Contribution per unit}} = \frac{4,20,000 - 1,95,000}{3} = 75,000 \text{ units}$$

The solution can also be presented in following way

Statement of profit

Particulars	If plant is continued ₹	If plant is shut down ₹
Selling Price	15 per unit	-



Less : Variable cost	12 per unit	-
Contribution	3 per unit	-
Capacity	60,000 units	-
Total contribution (60,000 units × ₹ 3)	1,80,000	
Less : Fixed Cost	4,20,000	1,70,000
Additional Fixed Cost	-	25,000
Loss	2,40,000	1,95,000

(i) Since the loss of Noida plant exceeds shut down cost it is better to shut down the plant.

(ii) Shut down point: $\frac{\text{Total fixed cost} - \text{Shut down cost}}{\text{Contribution per unit}}$

$$\frac{4,20,000 - 1,95,000}{3} = 75,000 \text{ units}$$

Q.55

MTP May 25(1)



RN Ltd. is a manufacturing company producing single product. The following information is available relating to current financial year:

Activity Level	100%
Sales and production (units)	4,400
	(₹)
Sales	88,00,000
Production costs:	
- Variable	35,20,000
- Fixed	8,80,000
Selling and distribution costs:	
- Variable	17,60,000
- Fixed	13,20,000

Fixed costs are incurred evenly throughout the year, and actual fixed costs are the same as budgeted. Thus, at 50% activity level, fixed production cost and fixed selling and distribution costs remains the same and other data/figures which are variable changes proportionately.

The normal level of activity for the year is 4,400 units. There were no stock at the beginning of the year. In the first quarter, 1,210 units were produced and 880 units were sold. You are required to COMPUTE the profit for the quarter using-

- Absorption costing
- Marginal costing.

Ans.

(i) Profit for the Quarter (Absorption Costing)

Particulars	(₹)	(₹)
Sales revenue (880 units × $\left(\frac{₹88,00,000}{4,400 \text{ units}}\right)$): (A)		17,60,000

Less: Production costs:		
- Variable cost (1,210 units × $\left(\frac{₹ 35,20,000}{4,400 \text{ units}}\right)$)	9,68,000	
- Fixed overheads absorbed (1,210 units × ₹ 200*)	2,42,000	12,10,000
Add: Opening stock		--
Less: Closing Stock [$\left(\frac{₹ 12,10,000}{1,210 \text{ units}}\right) \times 330 \text{ units}$]		(3,30,000)
Cost of Goods sold		8,80,000
Less: Adjustment for over-absorption of fixed production overheads **		(22,000)
Add: Selling & Distribution Overheads:		
- Variable (880 units × $\left(\frac{₹ 17,60,000}{4,400 \text{ units}}\right)$)	3,52,000	
- Fixed (1/4th of ₹ 13,20,000)	3,30,000	6,82,000
Cost of Sales (B)		15,40,000
Profit {(A) - (B)}		2,20,000

* absorption rate: ₹ 8,80,000/4,400 = ₹ 200 per unit

** Actual fixed production overhead - Absorbed fixed production overhead
 = ₹ 8,80,000/4 - 2,42,000 = ₹ (22,000)

(ii) Profit for the Quarter (Marginal Costing)

	(₹)	(₹)
Sales revenue (880 units × $\left(\frac{₹ 88,00,000}{4,400 \text{ units}}\right)$): (A)		17,60,000
Less: Production costs:		
- Variable cost (1,210 units × $\left(\frac{₹ 35,20,000}{4,400 \text{ units}}\right)$)		9,68,000
Add: Opening stock		--
Less: Closing Stock [$\left(\frac{₹ 9,68,000}{1,210 \text{ units}}\right) \times 330 \text{ units}$]		(2,64,000)
Variable cost of goods sold		7,04,000
Add: Selling & Distribution Overheads:		
- Variable (880 units × $\left(\frac{₹ 17,60,000}{4,400 \text{ units}}\right)$)		3,52,000
Cost of Sales (B)		10,56,000
Contribution {(C) = (A) - (B)}		7,04,000
Less: Fixed Costs:		
- Production cost $\left(\frac{₹ 8,80,000}{4}\right)$	(2,20,000)	
- Selling & distribution cost $\left(\frac{₹ 13,20,000}{4}\right)$	(3,30,000)	(5,50,000)
Profit		1,54,000



7

CHAPTER

STANDARD COSTING

Q.56

Material Variance

PY May 18



Beta Ltd. is manufacturing 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 @ 20 of total input is expected 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 was 195 ltrs.

Calculate:

- (i) Material Cost Variance
- (ii) Material Usage Variance.
- (iii) Material Price Variance

Ans

Take the good output of 195 ltr. The standard quantity of material required for 195 ltr. of output is

$$\frac{195}{80} \times 100 = 243.75 \text{ ltr.}$$

Statement showing computation of Standard Cost/Actual Cost/ Revised Actual Quantity

Material	Standard Cost			Actual Cost		
	Quantity [SQ] (Kg.)	Rate [SP] (₹)	Amount [SQ × SP] (₹)	Quantity [AQ] (Kg.)	Rate [AP] (₹)	Amount [AQ × AP] (₹)
A (60% of 243.75 ltr.)	146.25	40	5,850.00	140	42	5,880
B (40% of 243.75 Kg.)	97.50	60	5,850.00	110	56	6,160
	243.75		11,700.00	200		12,040

Note:

SQ = Standard Quantity = Expected Consumption for Actual Output

AQ = Actual Quantity of Material Consumed

SP = Standard Price Per Unit

AP = Actual Price Per Unit

Computation of Variances:

Material Cost Variance = SQ × SP - AQ × AP

A = ₹ 146.25 ltr. × ₹ 40 - 140 ltr. × ₹ 42 = ₹ 30.00 (A)

B = ₹ 97.50 ltr. × ₹ 60 - 110 ltr. × ₹ 56 = ₹ 310.00 (A)

Total = ₹ 30.00 (A) + ₹ 310.00 (A)

= ₹ 340.00 (A)

Material Usage Variance = SP × (SQ - AQ)

A = ₹ 40 × (146.25 ltr. - 140 ltr.) = ₹ 250.00 (F)

B = ₹ 60 × (97.50 ltr. - 110 ltr.) = ₹ 750.00 (A)

Total = ₹ 250.00 (F) + ₹ 750.00 (A)

= ₹ 500.00 (A)

Material Price Variance = $AQ \times (SP - AP)$

A = $140 \text{ Kg.} \times (\text{₹ } 40 - \text{₹ } 42) = \text{₹ } 280 \text{ (A)}$

B = $110 \text{ Kg.} \times (\text{₹ } 60 - \text{₹ } 56) = \text{₹ } 440 \text{ (F)}$

Total = $\text{₹ } 280 \text{ (A)} + \text{₹ } 440 \text{ (F)}$

= $\text{₹ } 160 \text{ (F)}$

Q.57

Material Variance

PY Nov 19



The standard cost of a chemical mixture is as follows: 60% of Material A @ ₹ 50 per kg

40% 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:

- (i) Material Cost Variance
- (ii) Material Price Variance
- (iii) Material Usage Variance
- (iv) Material Mix Variance
- (v) Material Yield Variance.

Ans

Basic Calculation

Material	Standard for 640 kg. output			Actual for 680 kg. output		
	Qty. Kg.	Rate (₹)	Amount (₹)	QtyKg.	Rate (₹)	Amount (₹)
A	480	50	24,000	540	60	32,400
B	320	60	19,200	260	50	13,000
Total	800		43,200	800		45,400
Less: Loss	160	-	-	120	-	-
	640		43,200	680		45,400

Std. cost of actual output = $\text{₹ } 43,200 \times 680/640 = \text{₹ } 45,900$

Calculation of Variances

(i) Material Cost Variance = (Std. cost of actual output - Actual cost)
 = $(45,900 - 45,400)$
 = $\text{₹ } 500 \text{ (F)}$

(ii) Material Price Variance = $(SP - AP) \times AQ$
 Material A = $(50 - 60) \times 540 = \text{₹ } 5,400 \text{ (A)}$
 Material B = $(60 - 50) \times 260 = \text{₹ } 2,600 \text{ (F)}$
 MPV = $\text{₹ } 2,800 \text{ (A)}$

(iii) Material Usage Variance (MUV) = (Std. Quantity for actual output - Actual Quantity) $\times$ Std. Price

Material A = $\left(\frac{480 \times 680}{640} - 540 \right) \times 50 = \text{₹ } 1,500 \text{ (A)}$

Material B = $\left(\frac{320 \times 680}{640} - 260 \right) \times 60 = \text{₹ } 4,800 \text{ (F)}$

MUV = $\text{₹ } 3,300 \text{ (F)}$

(iv) Material Mix Variance = $SP \times (RAQ - AQ)$



$$\begin{aligned}
 A &= ₹ 50 \times (480 \text{ Kg} - 540 \text{ Kg}) &= ₹ 3,000 \text{ (A)} \\
 B &= ₹ 60 \times (320 \text{ Kg} - 260 \text{ Kg}) &= ₹ 3,600 \text{ (F)} \\
 \text{Total} &= ₹ 3,000 \text{ (A)} + ₹ 3,600 \text{ (F)} &= ₹ 600 \text{ (F)}
 \end{aligned}$$

$$\begin{aligned}
 \text{(v) Material Yield Variance} &= SP \times (SQ - RAQ) \\
 A &= ₹ 50 \times (510 \text{ Kg} - 480 \text{ Kg}) &= ₹ 1,500 \text{ (F)} \\
 B &= ₹ 60 \times (340 \text{ Kg} - 320 \text{ Kg}) &= ₹ 1,200 \text{ (F)} \\
 \text{Total} &= ₹ 1,500 \text{ (F)} + ₹ 1,200 \text{ (F)} &= ₹ 2,700 \text{ (F)}
 \end{aligned}$$

Q.58

Material Variance

PY May 23



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:

- Calculate the standard price per kg and the standard quantity of raw material.
- Calculate the material usage variance, labour cost variance, and labour efficiency variance.
- Calculate the fixed overhead cost variance, the fixed overhead expenditure variance and the fixed overhead volume variance.

Note: Indicate the nature of variance i.e Favourable or Adverse.

Ans

- (i) Calculation of Standard price per kg and the standard quantity of raw material:

Standard Price

$$\begin{aligned}
 \text{(a) Material Price Variance} &= \text{Standard Cost of Actual Quantity} - \text{Actual Cost} \\
 12,500 \text{ (F)} &= (SP \times AQ) - ₹ 3,12,500 \\
 12,500 \text{ (F)} &= (SP \times 25,000) - ₹ 3,12,500 \\
 SP &= ₹ 13
 \end{aligned}$$

Standard Quantity

$$\begin{aligned}
 \text{(b) Material Cost Variance} &= \text{Standard Cost} - \text{Actual Cost} \\
 1,800 \text{ (A)} &= SQ \times ₹ 13 - ₹ 3,12,500 \\
 SQ &= 23,900 \text{ kg.}
 \end{aligned}$$

- (ii) Calculation of Material Usage Variance, Labour Cost Variance and Labour Efficiency Variance

$$\begin{aligned}
 \text{(a) Material Usage Variance} &= \text{Standard Cost of Standard Quantity for} \\
 &\quad \text{Actual Output} - \text{Standard Cost of Actual} \\
 &\quad \text{Quantity} \\
 &= SQ \times SP - AQ \times SP \\
 &\quad \text{Or} \\
 &= SP \times (SQ - AQ) \\
 &= ₹ 13 \times (23,900 \text{ kg.} - 25,000 \text{ kg.}) \\
 &= ₹ 14,300 \text{ (A)}
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) Labour Cost Variance} &= \text{Standard Cost} - \text{Actual Cost} \\
 &= (\text{SH} \times \text{SR}) - (\text{AH} \times \text{AR}) \\
 &= ₹ 2,39,000 - ₹ 2,30,000 \\
 &= ₹ 9,000 \text{ (F)} \\
 \text{(c) Labour Efficiency Variance} &= \text{Standard Cost of Standard Time for} \\
 &\quad \text{Actual Production} - \text{Standard Cost of Actual Time} \\
 &= (\text{SH} \times \text{SR}) - (\text{AH} \times \text{SR}) \\
 &\quad \text{Or} \\
 &= (\text{SH} - \text{AH}) \times \text{SR} \\
 &= ₹ 50 \times [4,780 \text{ hrs.} - 5,000 \text{ hrs.}] \\
 &= ₹ 11,000 \text{ (A)}
 \end{aligned}$$

(iii) Calculation of Fixed Overhead Cost Variance, Fixed Overhead Expenditure Variance and Fixed Overhead Volume Variance:

$$\begin{aligned}
 \text{(a) Fixed overhead cost variance} &= \text{Standard Fixed Overheads} - \text{Actual Fixed Overheads} \\
 &= 18,279 - 19,500 \\
 &= ₹ 1,221 \text{ (A)} \\
 \text{(b) Fixed Overhead Expenditure} &= \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads} \\
 \text{Variance} &= ₹ 19,120 - ₹ 19,500 \\
 &= ₹ 380 \text{ (A)} \\
 \text{(c) Fixed overhead volume variance} &= (\text{Budgeted output} - \text{Actual Output}) \times \\
 &\quad \text{Budgeted rate per unit} \\
 &= (2,00,000 - 1,91,200) 0.0956 \\
 &= ₹ 8,800 \times 0.0956 \\
 &= ₹ 841 \text{ (A)}
 \end{aligned}$$

Alternative presentation to part (iii) (a) and (b)

$$\begin{aligned}
 \text{(i) Fixed Overhead Cost Variance:} &= \text{Overhead absorbed for actual production} - \text{Actual overhead incurred} \\
 &= \frac{19,120}{2,00,000} \times 1,91,200 - 19,500 = ₹ 1,221 \text{ (A)} \\
 \text{(iii) Fixed Overhead Volume Variance:} &= \text{Absorbed overhead} - \text{Budgeted overhead} \\
 &= \frac{19,120}{2,00,000} \times 1,91,200 - 19,120 = ₹ 841 \text{ (A)}
 \end{aligned}$$

Working Notes:

- Standard time to produce 10 units of product X is 15 minutes. Therefore we can manufacture 40 units in an hour.
Hours available in a week
125 Workers $\times$ 40 Hours = 5,000 hours
Therefore budgeted output = 5,000 $\times$ 40 units per hour = 2,00,000 units
Alternatively
Budgeted time per unit = $\frac{15 \text{ units}}{10 \text{ units}} = 1.5 \text{ minutes}$
So, Budgeted output = $\frac{5,000 \text{ Hours} \times 60 \text{ Minutes}}{1.5 \text{ Minutes}} = 2,00,000 \text{ units}$
Actual output = 23,900 $\times$ 8 units = 1,91,200 units

$$\text{Standard hour for actual output} = 1,91,200 \times \frac{0.25 \text{ Hrs}}{10 \text{ units}} = 4,780 \text{ Hrs}$$

2.

Labour									
Budget			Revised standard			Actual			
Hours	Rate	₹	Hours	Rate	₹		Hours	Rate	₹
5,000	50	2,50,000	4,780	50	2,39,000	Skilled	3000	50	1,50,000
						Semi- Skilled	2000	40	80,000
							5000		2,30,000

3.

	Budget	Actual
Units	2,00,000	1,91,200
Fixed Overheads	19,120	19,500

4. Standard Fixed overheads:

$$\frac{19,120}{2,00,000} \times 1,91,200 = ₹18,279$$

Budgeted rate per unit:

$$\frac{19,120}{2,00,000} = ₹ 0.0956$$

Q.59

Material Variance

MTP May 23(1)



Following data is extracted from the books of RAMZY Ltd. for the month of March:

(i) Estimation-

Particulars	Quantity (kg.)	Price (₹)	Amount (₹)
Material-A	1320	?	--
Material-B	990	50	49500
			--

Normal loss was expected to be 5% of total input materials. (ii) Actuals- 2,500 kg of output produced.

Particulars	Quantity (kg.)	Price (₹)	Amount (₹)
Material-A	1500	?	--
Material-B	?	53	--
			98,000

(iii) Other Information-

Material Cost Variance = ₹ 5,500 (F)

Material Price Variance = ₹ 300 (F)

You are required to CALCULATE:

(i) Standard Price of Material-A;

(ii) Actual Quantity of Material-B;

(iii) Actual Price of Material-A;

(iv) Revised standard quantity of Material-A and Material-B; and

(v) Material Mix Variance.

Ans

(i) Material Cost Variance (A + B)	= {(SQ × SP) - (AQ × AP)}
Or ₹5,500	= (SQ × SP) - ₹98,000

Or (SQ × SP)	= ₹1,03,500
Or (SQA × SPA) + (SQB × SPB)	= ₹ 1,03,500
Or (1,503.8 kg × SPA) + (1,127.8 kg × ₹50)	= ₹ 1,03,500
Or (1,503.8 kg × SPA) + ₹56,390	= ₹1,03,500
Or (1,503.8 kg × SPA)	= ₹ 47,110
Or SPA	= $\frac{47,110}{1503.80 \text{ kg}}$ = ₹31.33
(ii) Material Price Variance (A + B)	= {(AQ × SP) - (AQ × AP)}
Or ₹300	= (AQ × SP) - ₹ 98,000
Or (AQ × SP)	= ₹ 98,300
Or (AQA × SPA) + (AQB × SPB)	= ₹98,300
Or (1,500 kg × ₹31.33 (from (i) above)) + AQB × ₹50	= ₹98,300
Or ₹ 46,995 + (AQB × ₹ 50)	= ₹ 98,300
Or (AQB × ₹ 50)	= ₹ 51,305
Or AQB	= 1,026 kg
Actual Quantity of Material B	= 1,026 kg.
(iii) (AQ × AP)	= ₹98,000
Or (AQA × APA) + (AQB × APB)	= ₹ 98,000
Or (1,500 kg × APA) + (1,026 kg (from (ii) above) × ₹53)	= ₹ 98,000
Or (1,500 kg × APA) + ₹ 54,378	= ₹ 98,000
Or (1,500 kg APA)	= ₹ 43,622
Or AP = $\frac{43,622}{1,500}$	= ₹ 29.10
Actual Price of Material A	= ₹ 29.10
(iv) Total Actual Quantity of Material-A and Material-B	= AQA + AQB
Or 1,500 kg + 1,026 kg (from (ii) above)	= 2,526 kg
Revised SQ _A = $\frac{1320 \text{ kg}}{(1,320 + 990)} \times 2,526 \text{ kg}$	= 1,443 kg
Revised SQ _B = $\frac{990 \text{ kg}}{(1,320 + 990)} \times 2,526 \text{ kg}$	= 1,083 kg

(v) Material Mix Variance (A + B) = {(RSQ × SP) - (AQ × SP)}

= {(RSQA × SPA) + (RSQB × SPB) - ₹98,300} = (1,443 kg (from (iv) above) × ₹ 31.33 (from (i) above)) + (1,083 kg (from (iv) above) × ₹50) - ₹98,300

= (₹45,209 + ₹54,150) - ₹98,300 = ₹ 1059 (F)

Q.60

Material, Labour Variance

RTP May 19



ABC Ltd. had prepared the following estimation for the month of April:

	Quantity	Rate (₹)	Amount (₹)
Material-A	800 kg.	45.00	36,000



Material-B	600 kg.	30.00	18,000
Skilled labour	1,000 hours	37.50	37,500
Unskilled labour	800 hours	22.00	17,600

Normal loss was expected to be 10% of total input materials and an idle labour time of 5% of expected labour hours was also estimated.

At the end of the month the following information has been collected from the cost accounting department:

The company has produced 1,480 kg. finished product by using the followings:

	Quantity	Rate (₹)	Amount (₹)
Material-A	900 kg.	43.00	38,700
Material-B	650 kg.	32.50	21,125
Skilled labour	1,200 hours	35.50	42,600
Unskilled labour	860 hours	23.00	19,780

You are required to CALCULATE:

- Material Cost Variance;
- Material Price Variance;
- Material Mix Variance;
- Material Yield Variance;
- Labour Cost Variance;
- Labour Efficiency Variance and
- Labour Yield Variance.

Ans

Material Variances:

Material	SQ (WN-1)	SP (₹)	SQ × SP (₹)	RSQ (WN-2)	RSQ × SP (₹)	AQ	AQ × SP (₹)	AP (₹)	AQ × AP (₹)
A	940 kg.	45.00	42,300	886 kg.	39,870	900 kg.	40,500	43.00	38,700
B	705 kg.	30.00	21,150	664 kg.	19,920	650 kg.	19,500	32.50	21,125
	1645 kg		63,450	1550 kg	59,790	1550kg	60,000		59,825

WN-1: Standard Quantity (SQ):

$$\text{Material A} - \left(\frac{800 \text{ kg}}{0.9 \times 1,400 \text{ kg}} \times 1,400 \text{ g} \right) = 939.68 \text{ or } 940 \text{ kg.}$$

$$\text{Material B} - \left(\frac{600 \text{ kg}}{0.9 \times 1,400 \text{ kg}} \times 1,400 \text{ g} \right) = 704.76 \text{ or } 705 \text{ kg.}$$

WN- 2: Revised Standard Quantity (RSQ):

$$\text{Material A} - \left(\frac{800 \text{ kg}}{1,400 \text{ kg}} \times 1,550 \text{ Kg} \right) = 885.71 \text{ or } 886 \text{ kg.}$$

$$\text{Material B} - \left(\frac{600 \text{ kg}}{1,400 \text{ kg}} \times 1,550 \text{ Kg} \right) = 664.28 \text{ or } 664 \text{ kg.}$$

- Material Cost Variance (A + B) = {(SQ × SP) - (AQ × AP)}
= {63,450 - 59,825} = 3,625 (F)
- Material Price Variance (A + B) = {(AQ × SP) - (AQ × AP)}
= {60,000 - 59,825} = 175 (F)
- Material Mix Variance (A + B) = {(RSQ × SP) - (AQ × SP)}
= {59,790 - 60,000} = 210 (A)
- Material Yield Variance (A + B) = {(SQ × SP) - (RSQ × SP)}
= {63,450 - 59,790} = 3,660 (F)

Labour Variances:

Labour	SH (WN-3)	SR (₹)	SH × SR (₹)	RSH	RSH × SR (₹)	AH	AH × SR (₹)	AR (₹)	AH × AR (₹)
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				(WN-4)					
Skilled	1,116 hrs	37.50	41,850	1144	42,900	1,200	45,000	35.50	42,600
Unskilled	893 hrs	22.00	19,646	916	20,152	860	18,920	23.00	19,780
	2,009 hrs		61,496	2,060	63,052	2,060	63,920		62,380

WN- 3: Standard Hours (SH):

$$\text{Skilled labour} - \left(\frac{0.95 \times 1,000 \text{ hr}}{0.90 \times 1,400 \text{ kg}} \times 1,480 \text{ Kg} \right) = 1,115.87 \text{ or } 1,116 \text{ hrs.}$$

$$\text{Unskilled labour} - \left(\frac{0.95 \times 800 \text{ hr}}{0.90 \times 1,400 \text{ kg}} \times 1,480 \text{ Kg} \right) = 892.69 \text{ or } 893 \text{ hrs.}$$

WN- 4: Revised Standard Hours (RSH):

$$\text{Skilled labour} - \left(\frac{1000 \text{ hr}}{1,800 \text{ hr}} \times 2,060 \text{ hr} \right) = 1,144.44 \text{ or } 1,144 \text{ hrs.}$$

$$\text{Unskilled labour} - \left(\frac{800 \text{ hr}}{1,800 \text{ hr}} \times 2,060 \text{ hr} \right) = 915.56 \text{ or } 916 \text{ hrs.}$$

- (e) Labour Cost Variance (Skilled + Unskilled) = {(SH × SR) - (AH × AR)}
= {61,496 - 62,380} = 884 (A)
- (f) Labour Efficiency Variance (Skilled + Unskilled) = {(SH × SR) - (AH × SR)}
= {61,496 - 63,920} = 2,424 (A)
- (g) Labour Yield Variance (Skilled + Unskilled) = {(SH × SR) - (RSH × SR)}

Q.61

Material, Labour Variance

RTP Nov 19



Aaradhya Ltd. manufactures a commercial product for which the standard cost per unit is as follows:

	(₹)
Material:	
5 kg. @ ₹ 4 per kg.	20.00
Labour:	
3 hours @ ₹10 per hour	30.00
Overhead	
Variable: 3 hours @ ₹1	3.00
Fixed: 3 hours @ ₹0.50	1.50
Total	54.50

During Jan. 20X8, 600 units of the product were manufactured at the cost shown below:

	(₹)
Materials purchased:	
5,000 kg. @ ₹4.10 per kg.	20,500
Materials used:	
3,500 kg.	
Direct Labour:	
1,700 hours @ ₹ 9	15,300
Variable overhead	1,900
Fixed overhead	900
Total	38,600

The flexible budget required 1,800 direct labour hours for operation at the monthly activity level used to set the fixed overhead rate.

**COMPUTE:**

- (a) Material price variance;
- (b) Material Usage variance;
- (c) Labour rate variance;
- (d) Labour efficiency variance;
- (e) Variable overhead expenditure variance;
- (f) Variable overhead efficiency variance;
- (g) Fixed overhead expenditure variance;
- (h) Fixed overhead volume variance;
- (i) Fixed overhead capacity variance; and
- (j) Fixed overhead efficiency variance.

Also RECONCILE the standard and actual cost of production.

Ans

- (a) Material price variance:
 $= (\text{Standard price} - \text{Actual Price}) \times \text{Actual quantity}$
 $= (\text{₹ } 4 - \text{₹ } 4.10) \times 5,000 = \text{₹ } 500 \text{ Adv.}$
- (b) Material usage variance:
 $= (\text{Std. quantity for actual output} - \text{Actual qty.}) \times \text{Std. price}$
 $= (600 \times 5 - 3,500) \times 4 = \text{₹ } 2,000 \text{ Adv.}$
- (c) Labour Rate Variance:
 $= (\text{Standard rate} - \text{Actual rate}) \times \text{Actual hours}$
 $= (\text{₹ } 10 - \text{₹ } 9) \times 1,700 = \text{₹ } 1,700 \text{ Fav.}$
- (d) Labour Efficiency Variance:
 $= (\text{Standard hours for actual output} - \text{Actual hours}) \times \text{Standard rate}$
 $= (600 \times 3 - 1,700) \times \text{₹ } 10$
 $= \text{₹ } 1,000 \text{ Fav.}$
- (e) Variable Overhead Expenditure Variance:
 $= (\text{Actual Hours} \times \text{Standard Rate}) - \text{Actual Overhead}$
 $= (1,700 \times \text{₹ } 1) - \text{₹ } 1,900$
 $= \text{₹ } 200 \text{ Adv.}$
- (f) Variable Overhead Efficiency Variance:
 $= (\text{Std. hours for actual output} - \text{Actual hours}) \times \text{Std. rate}$
 $= (600 \times 3 - 1,700) \times \text{₹ } 1 = \text{₹ } 100 \text{ Fav.}$
- (g) Fixed Overhead Expenditure Variance:
 $= (\text{Budgeted overhead} - \text{Actual overhead})$
 $= (1,800 \times 0.50 - 900) = \text{Nil}$
- (h) Fixed Overhead Volume Variance:
 $= (\text{Std. hours for actual output} - \text{Budgeted hours}) \times \text{Std. rate}$
 $= (600 \times 3 - 1,800) \times \text{₹ } 0.50 = \text{Nil}$
- (i) Fixed Overhead Capacity Variance:
 $= (\text{Budgeted hours} - \text{Actual Hours}) \times \text{Standard rate}$
 $= (1,800 - 1,700) \times \text{₹ } 0.50 = \text{₹ } 50 \text{ Adv.}$
- (j) Fixed Overhead Efficiency Variance:
 $= (\text{Std. hours for actual output} - \text{Actual hours}) \times \text{Standard rate}$
 $= (600 \times 3 - 1,700) \times \text{₹ } 0.50 = \text{₹ } 50 \text{ Fav.}$

Verification:	(₹)	(₹)
Overhead recovered: 600 units @ ₹4.50		2,700
Actual Overhead:		
Variable	1,900	
Fixed	900	2,800

		100 Adv.
Variable expenditure variance		200 Adv
Variable Efficiency variance		100 Fav.
Fixed expenditure variance		Nil
Fixed overhead volume variance		Nil
		100 Adv.

Reconciliation Statement

Standard Cost: 600 units @ ₹54.50		32,700	
Actual Cost:	38,600		
Less: Material Stock at standard cost: (1,500 × ₹4)	6,000	(32,600)	100 Fav.
Variances:	Adv. (₹)	Fav. (₹)	
Material price	500		
Material usage	2,000		
Labour rate		1,700	
Labour efficiency		1,000	
Variable expenditure	200		
Variable efficiency		100	
Total	2,700	2,800	100 Fav.

Q. 62

Material, Labour, OH Variance

RTP Dec 21



BabyMoon Ltd. uses standard costing system in manufacturing one of its product 'Baby Cap'. The details are as follows:

Direct Material 1 Meter @ ₹ 60 per meter	₹ 60
Direct Labour 2 hour @ ₹ 20 per hour	₹ 40
Variable overhead 2 hour @ ₹ 10 per hour	₹ 20
Total	₹ 120

During the month of August, 10,000 units of 'Baby Cap' were manufactured. Details are as follows:

Direct material consumed	11,400 meters	@	₹ 58 per meter	
Direct labour Hours	?	@	?	₹ 4,48,800
Variable overhead incurred				₹ 2,24,400

Variable overhead efficiency variance is ₹ 4,000 A. Variable overheads are based on Direct Labour Hours.

You are required to CALCULATE the following Variances:

- Material Variances- Material Cost Variance, Material Price Variance and Material Usage Variance.
- Variable Overheads variances- Variable overhead Cost Variance, Variable overhead Efficiency Variance and Variable overhead Expenditure Variance.
- Labour variances- Labour Cost Variance, Labour Rate Variance and Labour Efficiency Variance.

Ans

(i) Material Variances

Budget			Std. for actual			Actual		
Quantity (Meter)	Price (₹)	Amount (₹)	Quantity (Meter)	Price (₹)	Amount (₹)	Quantity (Meter)	Price (₹)	Amount (₹)
1	60	60	10,000	60	6,00,000	11,400	58	6,61,200

$$\text{Material Cost Variance} = (\text{SQ} \times \text{SP} - \text{AQ} \times \text{AP})$$



$$= 6,00,000 - 6,61,200 = ₹ 61,200 (A)$$

$$\begin{aligned} \text{Material Price Variance} &= (SP - AP) AQ \\ &= (60 - 58) 11,400 = ₹ 22,800 (F) \end{aligned}$$

$$\begin{aligned} \text{Material Usage Variance} &= (SQ - AQ) SP \\ &= (10,000 - 11,400) 60 = ₹ 84,000 (A) \end{aligned}$$

(ii) Variable Overheads variances Variable overhead cost Variance

$$= \text{Standard variable overhead} - \text{Actual Variable Overhead}$$

$$= (10,000 \text{ units} \times 2 \text{ hours} \times ₹ 10) - 2,24,400 = ₹ 24,400 (A)$$

Variable overhead Efficiency Variance

$$= (\text{Standard Hours} - \text{Actual Hours}) \times \text{Standard Rate per Hour}$$

Let Actual Hours be 'X', then:

$$(20,000 - X) \times 10 = 4,000 (A)$$

$$2,00,000 - 10X = -4,000$$

$$X = 2,04,000 \div 10$$

$$\text{Therefore, Actual Hours (X)} = 20,400$$

Variable overhead Expenditure Variance

$$= \text{Variable Overhead at Actual Hours} - \text{Actual Variable Overheads}$$

$$= 20,400 \times ₹ 10 - 2,24,400 = ₹ 20,400 (A)$$

(iii) Labour variances

Budget			Std. for actual			Actual		
Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)	Hours	Rate (₹)	Amount (₹)
2	20	40	20,000	20	4,00,000	20,400	22	4,48,800

$$* \text{Actual Rate} = ₹ 4,48,800 \div 20,400 \text{ hours} = ₹ 22$$

$$\text{Labour Cost Variance} = (SH \times SR) - (AH \times AR)$$

$$= 4,00,000 - 4,48,800 = ₹ 48,800 (A)$$

$$\text{Labour Rate Variance} = (SR - AR) \times AH$$

$$= (20 - 22) \times 20,400 = ₹ 40,800 (A)$$

$$\text{Labour Efficiency Variance} = (SH - AH) \times SR$$

$$= (20,000 - 20,400) \times 20 = ₹ 8,000 (A)$$

Q.63

Labour Variance

PY May 19



A gang of workers normally consists of 30 skilled workers, 15 semi-skilled workers and 10 unskilled workers. They are paid at standard rate per hour as under:

Skilled ₹ 70

Semi-skilled ₹ 65

Unskilled ₹ 50

In a normal working week of 40 hours, the gang is expected to produce 2,000 units of output. During the week ended 31st March, 2019, the gang consisted of 40 skilled, 10 semi-skilled and 5 unskilled workers. The actual wages paid were at the rate of ₹ 75,

₹ 60 and ₹ 52 per hour respectively. Four hours were lost due to machine breakdown

and 1,600 units were produced.

Calculate the following variances showing clearly adverse (A) or favourable (F)

- | | |
|----------------------------------|---------------------------|
| (i) Labour Cost Variance | (ii) Labour Rate Variance |
| (iii) Labour Efficiency Variance | (iv) Labour Mix Variance |
| (v) Labour Idle Time Variance | |

Ans

- (i) Labour Cost Variance = Standard Cost - Actual Cost
 = ₹1,14,400 - ₹1,54,400
 = 40,000 (A)
 $(1,600 \times 75 + 400 \times 60 + 200 \times 52 = ₹1,54,400)$
 Or

Types of workers	Standard Cost - Actual Cost	Amount (₹)
Skilled Workers	$(30 \times 40 \times 70 / 2,000 \times 1,600) - (40 \times 40 \times 75)$ 67,200 - 1,20,000	52,800 (A)
Semi- Skilled	$(15 \times 40 \times 65 / 2,000 \times 1,600) - (10 \times 40 \times 60)$ 31,200 - 24,000	7,200 (F)
Un-Skilled Workers	$(10 \times 40 \times 50 / 2,000 \times 1,600) - (5 \times 40 \times 52)$ 16,000 - 10,400	5,600 (F)
Total	1,14,400 - 1,54,400	40,000 (A)

- (ii) Labour Rate Variance

Types of workers	Actual Hours × (Standard Rate - Actual Rate)	Amount (₹)
Skilled Workers	1,600 hours × (₹70.00 - ₹75.00)	8,000 (A)
Semi- Skilled	400 hours × (₹65.00 - ₹60.00)	2,000 (F)
Un-Skilled Workers	200 hours × (₹50.00 - ₹52.00)	400 (A)
Total	₹8,000 (A) + ₹2,000 (F) + ₹400 (A)	6,400 (A)

- (iii) Labour Efficiency Variance

Types of workers	Standard Rate × (Standard Hours - Actual Hours)	Amount (₹)
Skilled Workers	₹70.00 × (960 hours - 1,440 hours)	33,600 (A)
Semi- Skilled	₹65.00 × (480 hours - 360 hours)	7,800 (F)
Un-Skilled Workers	₹50.00 × (320 hours - 180 hours)	7,000 (F)
Total	33,600 (A) + 7,800 (F) + 7,000 (F)	18,800 (A)

Alternatively labour efficiency can be calculated on basis of labour hours paid

Types of workers	Standard Rate × (Standard Hours - Actual Hours)	Amount (₹)
Skilled Workers	70.00 × (960 hours - 1600 hours)	44,800 (A)
Semi- Skilled	65.00 × (480 hours - 400 hours)	5,200 (F)
Un-Skilled Workers	50.00 × (320 hours - 200 hours)	6,000 (F)
Total	33,600 (A) + 7,800 (F) + 7,000 (F)	33,600 (A)

- (iv) Labour Mix Variance

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



@on the basis of hours worked

$$= 1,980 \text{ hours} \times \frac{1,14,400}{1,760 \text{ hrs.}} - \frac{1,440 \text{ hrs.} \times 70 + 360 \text{ hrs.} \times 65 + 180 \text{ hrs.} \times 50}{1,980 \text{ hrs.}}$$

$$= ₹ 4,500 (A)$$

Or

Labour Mix Variance

Types of workers	Std. Rate × (Revised Actual Hours Worked- Actual Hours Worked)	Amount (₹)
Skilled Workers	₹70 × (1,080 hrs. - 1440 hrs.)	25,200 (A)
Semi- Skilled	₹65 × (540 hrs. - 360 hrs.)	11,700 (F)
Un Skilled Workers	₹50 × (360 hrs. - 180 hrs.)	9,000 (F)
Total	₹25,200 (A) + ₹11,700 (F) + ₹9,000 (F)	4,500 (A)

(v) Labour Idle Time Variance

Types of workers	Standard Rate × (Hours Paid - Hours Worked)	Amount (₹)
Skilled Workers	₹70.00 × (1,600 hours - 1,440 hours)	11,200 (A)
Semi- Skilled	₹65.00 × (400 hours - 360 hours)	2,600 (A)
Un-Skilled Workers	₹50.00 × (200 hours - 180 hours)	1,000 (A)
Total	11,200 (A) + 2,600 (A) + 1,000 (A)	14,800 (A)

Verification:

Labour Cost Variance

$$= \text{Labour Rate Variance} + \text{Labour Efficiency Variance} + \text{Labour Idle Time Variance}$$

$$= 6,400 (A) + 18,800 (A) + 14,800 (A) = ₹ 40,000 (A)$$

Labour Cost Variance

$$= \text{Labour Rate Variance} + \text{Labour Efficiency Variance}$$

$$= 6400(A) + 33600(A) = ₹40000(A)$$

In this case, labour idle time variance is a part of labour efficiency variance.

Working Notes:

Category	Standard Cost			Actual (1600 units)			Revised Actual Hours
	Hrs.	Rate	Amt. (₹)	Hrs.	Rate	Amt. (₹)	
Skilled	960	70.00	67,200	1,440	75.00	1,08,000	1,080
	(30W×40×1,600/ 2, 000)			(40W×36)			(1,980×6/11)
Semi-Skilled	480	65.00	31,200	360	60.00	21,600	540
	(15W×40 ×1,600/2,000)			(10W×36)			(1,980×3/11)
Unskilled	320	50.00	16,000	180	52.00	9,360	360
	(10W×40 ×1,600/2,000)			(5W×36)			(1,980×2/11)
Total	1,760	65	1,14,400	1,980		1,38,960	1,980

Q.64

Labour Variance

PY May 22



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:

- (i) Labour Cost Variance
- (ii) Labour Rate Variance
- (iii) Labour Efficiency Variance
- (iv) Labour Idle time Variance

Ans

1. Calculation of standard man hours
When 120 worker works for 1 hr., then the std. output is 20 units.

$$\text{Std. man hour per unit} = \frac{120 \text{ hrs.}}{20 \text{ units}} = 6 \text{ hrs.}$$

2. Calculation of std. man hours for actual output
Total std. man hours = 1,000 units × 6 hrs. = 6,000 hrs.

Standard for actual			Actual				
Hours	Rate (₹)	Amount (₹)	Actual hrs. paid	Idle time hrs.	Production hrs.	Rate (₹)	Amount paid (₹)
6,000	25	1,50,000	5,760 (48 hrs. × 120 workers)	288	5,472	25.70	1,48,032

- (i) Labour cost variance
= Std. labour cost - Actual labour cost
= 1,50,000 - 1,48,032 = ₹ 1,968 F
- (ii) Labour rate variance
= (SR - AR) × AHPaid
= (25 - 25.70) × 5,760 = ₹ 4,032 A
- (iii) Labour efficiency variance
= (SH - AH) × SR
= (6,000 - 5,472) × 25 = ₹ 13,200 F
- (iv) Labour Idle time variance
= Idle Hours × SR
= 288 × 25 = ₹ 7,200 A

Note: Variances can also be calculated for one worker instead of 120.

Q.65

OH Variance

MTP May22(1)



Following are the details given:

Budgeted Days	25
Budgeted Fixed Overheads	1,00,000
Budgeted Production	800 units per day
Actual Production	21,000 units
Fixed Overheads are absorbed @	₹ 10 per hour.
Fixed overheads efficiency variance	10,000A
Fixed overheads calendar variance	8,000F
Fixed overheads cost variance	15,000A

You are required to CALCULATE:



- (a) Actual Fixed Overheads
- (b) Actual Days
- (c) Actual Hours
- (d) Fixed overheads Expenditure variance
- (e) Fixed overheads volume variance
- (f) Fixed overheads capacity variance

Ans

- (i) Fixed Overhead Cost Variance = (Std Fixed Overheads - Actual Fixed Overheads)

$$= \left(\frac{1,00,000}{20,000} \times 21,000 \text{ units} - \text{Actual Fixed Overheads} \right) = 15,000A$$

$$= (1,05,000 - \text{Actual Fixed Overheads}) = 15,000A$$

$$= \text{Actual Fixed Overheads} = 1,20,000$$

- (ii) Fixed Overhead Calendar Variance = (Actual Days - Budgeted Days) × Budgeted rate per day

$$= (\text{Actual Days} - 25) \times \frac{1,00,000}{25} = 8,000F$$

$$= (\text{Actual Days} - 25) = 2$$

$$= \text{Actual Days} = 27$$

- (iii) Fixed Overhead Efficiency Variance = (Standard Hours for Actual Production - Actual Hours) × Budgeted rate per hour

$$= \left(\frac{10,000}{20,000} \times 21,000 - \text{Actual Hours} \right) \times 10 = 10,000A$$

$$= (10,500 - \text{Actual Hours}) = -1,000$$

$$= \text{Actual Hours} = 11,500$$

- (iv) Fixed overheads Expenditure variance = (Budgeted Fixed Overheads - Actual Fixed Overheads)

$$= (1,00,000 - 1,20,000) = 20,000A$$

- (v) Fixed overheads volume variance = (Budgeted units - Actual Units) × Budgeted Rate per unit

$$= (20,000 - 21,000) \times \frac{1,00,000}{20,000} = 5,000F$$

- (vi) Fixed overheads capacity variance = (Budgeted Hours for Actual Days - Actual Hours)

$$\times \text{Budgeted Rate per Hour.}$$

$$= \left(\frac{10,000}{25} \times 27 - 11,500 \right) \times 10 = 7,000F$$

Q.66

PY Nov 23



PQR Alloys Ltd. uses a standard costing system.

Budgeted information for the year:

Budgeted output

84,000 units

Variable Factory Overhead per unit

₹ 16

Standard time for one unit of output

0.80 machine hour

Fixed factory overheads

₹ 6,72,000

Actual results for the year:

Actual output

87,600 units

Variable Overhead efficiency variance

₹ 67,200 (A)

Actual Fixed factory overheads

₹ 7,05,000

Actual variable factory overheads ₹ 14,37,000

Required:

Calculate the following variances clearly indicating Adverse(A) or Favourable (F):

- (i) Variable factory overhead expenditure variance.
- (ii) Fixed factory overhead expenditure variance.
- (iii) Fixed factory overhead efficiency variance.
- (iv) Fixed factory overhead capacity variance.

Ans.

Calculation of actual hours

$$\text{Standard rate per hour} = \frac{\text{Variable factory overhead per unit}}{\text{Standard time for one unit of output}} = \frac{16}{0.8} = ₹20$$

Variable Overhead Efficiency Variance:

(Standard hours for actual production - Actual hours) × Standard rate per hour

Let actual hours be x

$$[(87,600 \times 0.8) - x] \times 20 = -67,200$$

$$(70,080 - x) \times 20 = -67,200$$

$$x = 73,440$$

(i) Variable Factory Overhead Expenditure Variance:

(Variable overhead at actual hours - Actual variable overheads)

$$\left[\left(\frac{13,44,000}{67,200} \times 73,440 \right) - 14,37,000 \right]$$

(ii) Fixed Factory Overhead Expenditure Variance:

Budgeted fixed overhead - Actual fixed overhead.

$$(6,72,000 - 7,05,000)$$

$$= 33,000 \text{ A}$$

(iii) Fixed Factory Overhead Efficiency Variance:

(Standard hours for actual production - Actual hours) × Standard rate per hour

$$(70,080 - 73,440) \times 10 = 33,600 \text{ A}$$

(iv) Fixed Overhead Capacity Variance:

(Actual hours - Budgeted hours) × Standard rate per hour

$$(73,440 - 67,200) \times 10 = 62,400 \text{ F}$$

The solution can also be presented in following way based on Quantity (units)

Calculation of standard quantity for actual hours:

Variable standard rate per unit (SR) = ₹ 16

Variable Overhead Efficiency Variance:

(SR × AQ) - (SR × standard quantity for Actual hours worked)

$$-67,200 = (16 \times 87,600) - 16 \times x$$

$$-67,200 = 14,01,600 - 16 \times x$$

$$x = 14,68,800 / 16 = 91,800 \text{ (SQ for actual hours worked)}$$

(i) Variable Factory Overhead Expenditure Variance:

(SR × SQ for actual hour worked - Actual variable overheads)

$$16 \times 91,800 - 14,37,000 \text{ or } 14,68,800 - 14,37,000$$

$$= 31,800 \text{ F}$$

(ii) Fixed Factory Overhead Expenditure Variance:

Budgeted fixed overhead - Actual fixed overhead.

$$(6,72,000 - 7,05,000)$$

$$= 33,000 \text{ A}$$

**(iii) Fixed Factory Overhead Efficiency Variance:**

Standard rate per unit (SR) = $6,72,000 / 84,000 = ₹ 8$ per unit

(SR × AQ) - (SR × standard quantity for Actual hours)

$(8 \times 87,600) - (8 \times 91,800)$

$(7,00,800 - 7,34,400) = 33,600 \text{ A}$

(iv) Fixed Overhead Capacity Variance:

(SR × standard quantity for Actual hours - Budgeted fixed overheads)

$(8 \times 91,800) - (6,72,000)$

$(7,34,400 - 6,72,000) = 62,400 \text{ F}$



8

 CHAPTER

JOINT & BY PRODUCT

Q.67 Allocate Cost

PY Nov 19



A Factory produces two products, '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 - 120 units @ ₹ 200 per unit.

- I. Apportion joints costs on the basis of:
- Physical Quantity of each product.
 - Contribution Margin method, and
- II. Determine Profit or Loss under both the methods.

Ans.

Total Joint Cost

	Amount (₹)
Direct Material	30,000
Direct Labour	9,600
Variable Overheads	12,000
Total Variable Cost	51,600
Fixed Overheads	32,000
Total joint cost	83,600

Apportionment of Joint Costs:

			Product - A	Product - B
I.	(i)	Apportionment of Joint Cost on the basis of 'Physical Quantity'	₹ 38,000 $\left(\frac{83600}{100 + 120\text{units}} \times 100 \right)$	₹ 45,600 $\left(\frac{83600}{100 + 120\text{units}} \times 120 \right)$
	(ii)	Apportionment of Joint Cost on the basis of 'Contribution Margin Method':		
		- Variable Costs (on basis of physical units)	₹ 23,455 $\left(\frac{51600}{100 + 120\text{units}} \times 100 \right)$	₹ 28,145 $\left(\frac{51600}{100 + 120\text{units}} \times 120 \right)$
		Contribution Margin	36,545 (₹600×100 - 23,455)	-4,145 (₹200×120 - 28,145)
		Fixed Costs*	₹ 32,000	
		Total apportioned cost	₹ 55,455	₹ 28,145

II.	(iii)	Profit or Loss:		
When Joint cost apportioned on basis of physical units				
A.	Sales Value		₹ 60,000	₹ 24,000
B.	Apportioned joint cost on basis of 'Physical Quantity':		₹ 38,000	₹ 45,600
A-B	Profit or (Loss)		22,000	(21,600)
When Joint cost apportioned on basis of 'Contribution Margin Method'				
C	Apportioned joint cost on basis of 'Contribution Margin Method'		₹ 55,455	₹ 28,145
A-C	Profit or (Loss)		₹ 4,545	₹ (4,145)

* 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.

Q.68

Allocate Cost

PY May 23



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.

Required:

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'.

Ans.

Working Notes:

1. Calculation of Input of Raw Material

Let assume total raw material in Process R be 100%

∴ Output of Process T will be equal to:

Input R	100%
- 10% Normal Loss	₹ 10
Input S	₹ 90%
- 10% Normal loss	₹ 9
Input T	81%
- 10% Normal loss	₹ 8.1
Output of T	72.9
Actual output of X	14,580 units

Which is 80% of the total output

∴ Output of Process T

$$= \frac{14580}{80\%} = 18,225$$

$$\therefore \text{Input of Process R} = \frac{18225}{72.9\%} = 25,000 \text{ kgs}$$

Alternative presentation for Calculation of Input in Process R, S and T Working notes:

Process T (Kg.)			
To Input (Transfer from process S)	20,250	By Normal loss	2,025
		By Output Product X	14,580
		By output of by-product Z	3,645
	20,250		20,250

Process S (kg.)			
To Input (Transfer from process S)	22,500	By Normal loss (10%)	2,250
		By Transfer to process T	20,250
	22,500		22,500

Process R (kg.)			
To Input	25,000	By Normal loss (10%)	2,500
		By Transfer to process S	22,500
	25,000		25,000

2. Calculation of Joint Cost

Process	Inputs	Variable cost per kg	Variable cost	Fixed Cost	Total Cost
		₹	₹	₹	₹
R	25,000	5	1,25,000	42,000	1,67,000
S	22,500	4.5	1,01,250	5,000	1,06,250
T	20,250	3.4	68,850	4,800	73,650
					3,46,900

Raw material	J	10000 × 15	₹ 1,50,000
	K	10000 × 9	₹ 90,000
	L	5000 × 7	₹ 35,000
			2,75,000

Add: Processing cost (as above) ₹ 3,46,900
 Total Joint Cost 6,21,900

(i) Statement showing apportionment of Joint Cost

Particulars	Product X	By-Product Z	Total
Units	14,580	3,645	
Selling price (₹)	60	30	

Sales Value (₹)	8,74,800	1,09,350	9,84,150
(₹ 6,21,900 to apportioned in ratio of sales value at split off point)	5,52,800	69,100	6,21,900

(ii) Statement of Profitability

Particulars	Product X	By-Product Z	Total
Sales Value	8,74,800	1,09,350	9,84,150
Joint Cost (As apportioned above)	(5,52,800)	(69,100)	(6,21,900)
Profit	3,22,000	40,250	3,62,250

Q.69

Allocate Cost

PY Jan 21



Mayura Chemicals Ltd buys a particular raw material at ₹ 8 per litre. At the end of the processing Department-I, 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	Department		
	1	2	3
Cost of Raw Material	₹ 4,80,000	-	-
Direct Labour	₹ 70,000	₹ 4,50,000	₹ 6,50,000
Manufacturing Overhead	₹ 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-realizable value method of allocating joint costs.

You are required to prepare:

- Schedule showing the allocation of joint costs.
- Calculate the Cost of goods sold of each product and the cost of each item in Inventory.
- A comparative statement of Gross profit.

Ans.

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

	Products			Total (₹)
	X (₹)	Y (₹)	Z (₹)	
Final sales value of total production (Working Note 1)	4,50,000 (15,000 × ₹ 30)	9,60,000 (15,000 × ₹ 64)	15,00,000 (30,000 × ₹ 50)	29,10,000

Less: Additional cost	--	6,60,000	11,00,000	17,60,000
Net realisable value (at split-off point)	4,50,000	3,00,000	4,00,000	11,50,000
Joint cost allocated (Working Note 2)	2,34,000	1,56,000	2,08,000	5,98,000

(ii) Calculation of Cost of goods sold and Closing inventory

	Products			Total (₹)
	X (₹)	Y (₹)	Z (₹)	
Allocated joint cost	2,34,000	1,56,000	2,08,000	5,98,000
Add: Additional costs	--	6,60,000	11,00,000	17,60,000
Cost of goods sold (COGS)	2,34,000	8,16,000	13,08,000	23,58,000
Less: Cost of closing inventory (Working Note 1)	78,000 (COGS × 100/3%)	--	3,27,000 (COGS × 25%)	4,05,000
Cost of goods sold	1,56,000	8,16,000	9,81,000	19,53,000

(iii) Comparative Statement of Gross Profit

	Products			Total (₹)
	X (₹)	Y (₹)	Z (₹)	
Sales revenue	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

Working Notes:

1. Total production of three products for the year 2019-2020

Products	Quantity sold in litres	Quantity of closing inventory in litres	Total production	Closing inventory percentage (%)
(1)	(2)	(3)	(4) = [(2) + (3)]	(5) = (3)/ (4)
X	10,000	5,000	15,000	100/3
Y	15,000	--	15,000	--
Z	22,500	7,500	30,000	25

2. Joint cost apportioned to each product:

$$= \frac{\text{Total Joint cost}}{\text{Total Net Realisable Value}} \times \text{Net Realisable Value of each product}$$

$$\text{Joint cost of product X} = \frac{598000}{1150000} \times ₹ 4,50,000 = ₹ 2,34,000$$

$$\text{Joint cost of product Y} = \frac{598000}{1150000} \times ₹ 3,00,000 = ₹ 1,56,000$$

$$\text{Joint cost of product Z} = \frac{598000}{1150000} \times ₹ 4,00,000 = ₹ 2,08,000$$

Q.70

Allocate Cost & Further Process

RTP May 18



A company processes a raw material in its Department 1 to produce three products, viz. A, B and X at the same split-off stage. During a period 1,80,000 kgs of raw materials were processed in Department 1 at a total cost of ₹ 12,88,000 and the resultant output of A, B and X were 18,000 kgs, 10,000 kgs and 54,000 kgs respectively. A and B were further processed in Department 2 at a cost of ₹ 1,80,000 and ₹ 1,50,000 respectively. X was further processed in Department 3 at a cost of ₹ 1,08,000. There is no waste in further processing. The details of sales affected during the period were as under:

	A	B	X
Quantity Sold (kgs.)	17,000	5,000	44,000
Sales Value (₹)	12,24,000	2,50,000	7,92,000

There were no opening stocks. If these products were sold at split-off stage, the selling prices of A, B and X would have been ₹ 50, ₹ 40 and ₹ 10 per kg respectively.

Required:

- PREPARE a statement showing the apportionment of joint costs to A, B and X.
- PREPARE a statement showing the cost per kg of each product indicating joint cost and further processing cost and total cost separately.
- PREPARE a statement showing the product wise and total profit for the period.
- DECIDE with supporting calculations as to whether any or all the products should be further processed or not

Ans.

- Statement showing the apportionment of joint costs to A, B and X

Products	A	B	X	Total
Output (kg)	18,000	10,000	54,000	
Sales value at the point of split off (₹)	9,00,000 (₹ 50 × 18,000)	4,00,000 (₹ 40 × 10,000)	5,40,000 (₹ 10 × 54,000)	18,40,000
Joint cost apportionment on the basis of sales value at the point of split off (₹)	6,30,000 $\left(\frac{1288000}{1840000} \times 900000 \right)$	2,80,000 $\left(\frac{1288000}{1840000} \times 400000 \right)$	3,78,000 $\left(\frac{1288000}{1840000} \times 540000 \right)$	12,88,000

- Statement showing the cost per kg. of each product (indicating joint cost; further processing cost and total cost separately)

Products	A	B	X
Joint costs apportioned (₹) : (I)	6,30,000	2,80,000	3,78,000
Production (kg) : (II)	18,000	10,000	54,000
Joint cost per kg (₹): (I ÷ II)	35	28	7
Further processing Cost per kg. (₹)	10 $\left(\frac{180000}{18000 \text{ kg}} \right)$	15 $\left(\frac{150000}{10000 \text{ kg}} \right)$	2 $\left(\frac{108000}{54000 \text{ kg}} \right)$

Total cost per kg (₹)	45	43	9
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(iii) Statement showing the product wise and total profit for the period

Products	A	B	X	Total
Sales value (₹)	12,24,000	2,50,000	7,92,000	
Add: Closing stock value (₹) (Refer to Working note 2)	45,000	2,15,000	90,000	
Value of production (₹)	12,69,000	4,65,000	8,82,000	26,16,000
Apportionment of joint cost (₹)	6,30,000	2,80,000	3,78,000	
Add: Further processing cost (₹)	1,80,000	1,50,000	1,08,000	
Total cost (₹)	8,10,000	4,30,000	4,86,000	17,26,000
Profit (₹)	4,59,000	35,000	3,96,000	8,90,000

Working Notes

1.

Products	A	B	X
Sales value (₹)	12,24,000	2,50,000	7,92,000
Quantity sold (Kgs.)	17,000	5,000	44,000
Selling price ₹/kg	72 $\left(\frac{1224000}{17000 \text{ kg}} \right)$	50 $\left(\frac{250000}{5000 \text{ kg}} \right)$	18 $\left(\frac{792000}{44000 \text{ kg}} \right)$

2. Valuation of closing stock:

Since the selling price per kg of products A, B and X is more than their total costs, therefore closing stock will be valued at cost.

Products	A	B	X	Total
Closing stock (kgs.)	1,000	5,000	10,000	
Cost per kg (₹)	45	43	9	
Closing stock value(₹)	45,000 (₹ 45 x 1,000 kg)	2,15,000 (₹ 43 x 5,000 kg)	90,000 (₹9x10,000 kg)	3,50,00

(iv) Calculations for processing decision

Products	A	B	X
Selling price per kg at the point of split off (₹)	50	40	10
Selling price per kg after further processing (₹) (Refer to working Note 1)	72	50	18
Incremental selling price per kg (₹)	22	10	8
Less: Further processing cost per kg (₹)	(10)	(15)	(2)
Incremental profit (loss) per kg (₹)	12	(5)	6

Product A and X has an incremental profit per unit after further processing, hence, these two products may be further processed. However, further processing of product B is not profitable hence, product B shall be sold at split off point.



Q.71

Allocate Cost

RTP Nov 23



A factory producing article A also produces a by-product B which is further processed into finished product. The joint cost of manufacture is given below:

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

Subsequent cost in ₹ are given below:

	A	B
Material	3,000	1,500
Labour	1,400	1,000
Overhead	600	500
	5,000	3,000

Selling prices are A ₹ 16,000
 B ₹ 8,000

Estimated profit on selling prices is 25% for A and 20% for B.

Assume that selling and distribution 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.

Ans.

Apportionment of Joint Costs

Particulars	A (₹)	B (₹)
Selling Price	16,000	8,000
Less: Estimated profit	4,000 (25% of ₹16,000)	1,600 (20% of ₹ 8,000)
Cost of sales	12,000	6,400
Less: Selling & Distribution exp. (Refer working note)	267 (₹ 400 × 2/3)	133 (₹ 400 × 1/3)
Less: Subsequent cost	5,000	3,000
Share of Joint cost	6,733	3,267

So, Joint cost of manufacture is to be distributed to A & B in the ratio of 6733 : 3267

Statement showing Cost of Production of A and B

Elements of cost	Joint Cost		Subsequent Cost		Total Cost	
	A	B	A	B	A	B
Material	3,367	1,633	3,000	1,500	6,367	3,133
Labour	2,020	980	1,400	1,000	3,420	1,980
Overheads	1,346	654	600	500	1,946	1,154
Cost of production					11,733	6,267

Working Note:

Calculation of Selling and Distribution Expenses

Particulars	(₹)
Total Sales Revenue (₹ 16,000 + ₹ 8,000)	24,000
Less: Estimated Profit (₹ 4,000 + ₹ 1,600)	(5,600)

Cost of Sales	18,400
Less: Cost of production:	
- Joint Costs	(10,000)
- Subsequent costs (₹ 5,000 + ₹ 3,000)	(8,000)
Selling and Distribution expenses (Balancing figure)	400

Q.72

Further Processing

RTP May 23



Key Pee Limited produces and sells the following products:

Products	Units	Selling price at split-off point (₹)	Selling price after further processing (₹)
A	500000	42.5	62.5
B	75000	32.5	42.5
C	62500	20	30
D	50000	25	-
E	187500	35	50

Cost of raw material ₹ 89,75,000 and other manufacturing ex-penses cost ₹13,67,500 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 ₹31,25,000; ₹ 3,75,000; ₹1,25,000 and ₹3,75,000 respectively. Fixed costs are ₹11,82,500.

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

- Statement showing income forecast of the company assuming that none of its products are to be further processed.
- Statement showing income forecast of the company assuming that products A, B, C and E are to be processed further.

Ans.
Working Note:

Apportionment of joint costs on the basis of Net Realisable Value method

Products	Sales Value (₹)	Post separation Cost (₹)	Net Realisable Value (₹)	Apportioned Cost (₹)
A	3,12,50,000 (5,00,000 units × ₹ 62.50)	31,25,000	2,81,25,000	67,74,563
B	31,87,500 (75,000 units × ₹ 42.5)	3,75,000	28,12,500	6,77,456
C	18,75,000 (62,500 units × ₹ 30)	1,25,000	17,50,000	4,21,528
D	12,50,000 (50,000 units × ₹ 25)	---	12,50,000	3,01,092
E	93,75,000 (1,87,500 units × ₹ 50)	3,75,000	90,00,000	21,67,860
			4,29,37,500	1,03,42,500

Total joint cost = Raw material costs + Manufacturing expenses = ₹89,75,000 + ₹13,67,500 = ₹1,03,42,500

Apportioned joint cost = (Total Joint Cost / Total Net Realisable value of each X Net Realisable value of each product)

Apportioned joint cost for Product A = (1,03,42,500 / 4,29,37,500 X 2,81,25,000) = ₹67,74,563.32

Similarly, the apportioned joint cost for products B, C, D and E are ₹6,77,456, ₹4,21,528, ₹3,01,092 and ₹21,67,860 respectively.

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

	Products					Total (₹)
	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)	
Sales revenue	2,12,50,000 (₹42.5 × 5,00,000)	24,37,500 (₹ 32.5 × 75,000)	12,50,000 (₹ 20 × 62,500)	12,50,000 (₹ 25 × 50,000)	65,62,500 (₹ 35 × 1,87,500)	3,27,50,000
Less: Apportioned Costs (Refer Working note)	67,74,563	6,77,456	4,21,528	3,01,092	21,67,860	1,03,42,500
	1,44,75,437	17,60,044	8,28,472	9,48,908	43,94,640	2,24,07,500
Less: Fixed Cost						11,82,500
Profit						2,12,25,000

- (b) Statement showing income forecast of the company: assuming that products A, B, C and E are further processed (Refer to working note)

	Products					Total (₹)
	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)	
A. Sales revenue	3,12,50,000	31,87,500	18,75,000	12,50,000	93,75,000	4,69,37,500
B. Apportioned Costs	67,74,563	6,77,456	4,21,528	3,01,092	21,67,860	1,03,42,500
C. Further processing cost	31,25,000	3,75,000	1,25,000	-	3,75,000	40,00,000
D. Total processing cost (B+ C)	98,99,563	10,52,456	5,46,528	3,01,092	25,42,860	1,43,42,500
E. Excess of sales revenue (A-D)	2,13,50,437	21,35,044	13,28,472	9,48,908	68,32,140	3,25,95,000
F. Fixed Cost						11,82,500
G. Profit (E - F)						3,14,12,500

Q.73

NRV Method to apportion cost

MTP Nov 20



'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, 2020, 'Buttery Butter' purchased 50 Kilolitre processed cream @ ₹ 100 per 1000 ml. Conversion cost of ₹ 1,00,000 were incurred up-to the split off point, where two saleable products were produced i.e. buttermilk and butter. Butter can be further processed into Ghee.

The January, 2020 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, 2020.

Required:

- SHOW how joint cost would be apportioned between Buttermilk and Butter under Estimated Net Realisable Value method.
- '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?

Ans.

- Estimated Net Realisable Value Method:**

	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

* [(₹ 100 × 50 × 1000) + ₹ 1,00,000] = ₹ 51,00,000

- Incremental revenue from further processing of Butter into Ghee
(₹ 480 × 16 × 1000 - ₹ 360 × 20 × 1000) ₹ 4,80,000
Less: Incremental cost of further processing of Butter into Ghee ₹ 1,20,000
Incremental operating income from further processing ₹ 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.

Q.74

Reverse Calculation

MTP Nov 18(1)



Three products X, Y and Z alongwith a byproduct B are obtained again in a crude state which require further processing at a cost of Rs. 5 for X; Rs. 4 for Y; and Rs. 2.50 for Z per unit before sale. The byproduct is however saleable as such to a nearby factory. The selling prices for the three main products and byproduct, assuming they should yield a net margin of 25 percent of cost, are fixed at Rs. 13.75 Rs. 8.75 and Rs. 7.50 and Re. 1.00 respectively - all per unit quantity sold.

During a period, the joint input cost including the material cost was Rs. 90,800 and the respective outputs were:

X	8,000 units
Y	6,000 units
Z	4,000 units
B	1,000 units

By product should be credited to the joint cost and only the net joint costs are to be allocated to the main products.

CALCULATE the joint cost per unit of each product and the margin available as a percentage on cost.

Ans.

Working Notes:

(i) Computation of Allocation Ratio for Joint Costs

	Products		
	X Rs.	Y Rs.	Z. Rs.
Selling Price	13.75	8.75	7.50
Less: Anticipated margin@ 25% on cost or 20% on sales	2.75	1.75	1.50
Cost of sales	11.00	7.00	6.00
Less: Post split off cost	5.00	4.00	2.50
Joint cost per unit	6.00	3.00	3.50
Output (units)	8,000	6,000	4,000
Total output cost	48,000	18,000	14,000
Allocation ratio for joint costs	24	9	7

(ii) Computation of net allocable joint costs

	Rs.	Rs.
Joint input cost including material cost		90,800
Less: Credit for realization from by-product B: Sales revenue (1,000 × Re. 1)	1,000	
Less: profit @ 25% on cost or 20% on sales	200	800
Net joint costs to be allocated		90,000

Determination of joint cost per unit of each product

Product	Net joint costs allocation Rs.	Output (units) Rs.	Joint cost per unit Rs.
X	54,000 (Note : 1)	8,000	6.75
Y	20,250	6,000	3.38
Z	15,750	4,000	3.94
	90,000		

Profit margin available on each product as a percentage on cost

Product	Joint Cost Rs.	Post split off cost Rs.	Total Cost Rs.	Selling Price Rs.	Margin Rs.	Margin % on cost Rs.
X	6.75	5.00	11.75	13.75	2.00	17.02
Y	3.38	4.00	7.38	8.75	1.37	18.56
Z	3.94	2.50	6.44	7.50	1.06	16.46

Note: 1

$$\begin{aligned}
 X &= \frac{24}{40} \times 90,000 = 54,000 \\
 Y &= \frac{9}{40} \times 90,000 = 20,250 \\
 Z &= \frac{7}{40} \times 90,000 = 15,750 \\
 &\quad \underline{90,000}
 \end{aligned}$$

9

CHAPTER

PROCESS COSTING

Q.75

Process Cost a/c & FG a/c

PY May 19



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.

Ans.
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
Direct materials	9,000	9,000	—				
Direct wages	5,000	5,000	—				
	19,000	19,000	—				
Less: Closing stock	(2,000)	(2,000)	—				
Prime Cost	17,000	17,000	—				
Overheads	4,600	4,600	—				
Process Cost	21,600	21,600	—				
Profit (33.33% of total cost)	7,200	—	7,200				
	28,800	21,600	7,200		28,800	21,600	7,200

Process-B A/c

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
Opening stock	5,500	4,500	1,000	Finished stock A/c	61,675	41,550	20,125



Process A A/c	28,800	21,600	7,200				
Direct materials	9,500	9,500	—				
Direct wages	6,000	6,000	—				
	49,800	41,600	8,200				
Less: Closing stock	(2,490)	(2,080)	(410)				
Prime Cost	47,310	39,520	7,790				
Overheads	2,030	2,030	—				
Process Cost	49,340	41,550	7,790				
Profit (25% of total cost)	12,335	—	12,335				
	61,675	41,550	20,125		61,675	41,550	20,125

Finished Stock A/c

Particulars	Total (₹)	Cost (₹)	Profit (₹)	Particulars	Total (₹)	Cost (₹)	Profit (₹)
Opening stock	10,000	6,000	4,000	Costing P&L A/c	75,000	44,181	30,819
Process B A/c	61,675	41,550	20,125				
	71,675	47,550	24,125				
Less: Closing stock	(5,000)	(3,369)	(1,631)				
COGS	66,675	44,181	22,494				
Profit	8,325	—	8,325				
	75,000	44,181	30,819		75,000	44,181	30,819

Q.76

Process 1-2 a/c

PY Nov 20



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

	(₹)
Opening work in process (3,000 units)	
Materials	1,80,500
Labour	32,400
Overheads	90,000
Materials introduced in Process-I (42,000 units)	36,04,000
Labour	4,50,000
Overheads	15,18,000

Units Scrapped : 4,800 units
Degree of completion :
Materials : 100%
Labour & overhead : 70%
Closing Work-in-process : 4,200 units
Degree of completion :
Materials : 100%
Labour & overhead : 50%
Units finished and transferred to Process-II : 36,000 units

Normal loss:

4% of total input including opening work-in-process

Scrapped units fetch ₹ 62.50 per piece.

Prepare:

- (i) Statement of equivalent production.
- (ii) Statement of cost per equivalent unit.
- (iii) Process-I A/c
- (iv) Normal Loss Account and
- (v) Abnormal Loss Account

Ans.

(i) Statement of Equivalent Production (Weighted Average method)

Particulars	Input Units	Particulars	Output Units	Equivalent Production			
				Material		Labour & O.H.	
				%	Units	%	Units
Opening WIP	3,000	Completed and Transferred to Process-II	36,000	100	36,000	100	36,000
Units introduced	42,000	Normal Loss (4% of 45,000 units)	1,800	--	--	--	--
		Abnormal loss (Balancing figure)	3,000	100	3,000	70	2,100
		Closing WIP	4,200	100	4,200	50	2,100
	45,000		45,000		43,200		40,200

(ii) Statement showing cost for each element

Particulars	Materials (₹)	Labour (₹)	Overhead (₹)	Total (₹)
Cost of opening work-in-process	1,80,500	32,400	90,000	3,02,900
Cost incurred during the month	36,04,000	4,50,000	15,18,000	55,72,000
Less: Realisable Value of normal scrap (₹ 62.50 × 1,800 units)	(1,12,500)	--	--	(1,12,500)
Total cost: (A)	36,72,000	4,82,400	16,08,000	57,62,400
Equivalent units: (B)	43,200	40,200	40,200	
Cost per equivalent unit: (C) = (A ÷ B)	85.00	12.00	40.00	137.00

Statement of Distribution of cost

Particulars	Amount (₹)	Amount (₹)
1. Value of units completed and transferred: (36,000 units × ₹ 137)		49,32,000
2. Value of Abnormal Loss:		
- Materials (3,000 units × ₹ 85)	2,55,000	
- Labour (2,100 units × ₹ 12)	25,200	
- Overheads (2,100 units × ₹ 40)	84,000	3,64,200

3. Value of Closing W-I-P:		
- Materials (4,200 units × ₹ 85)	3,57,000	
- Labour (2,100 units × ₹ 12)	25,200	
- Overheads (2,100 units × ₹ 40)	84,000	4,66,200

(iii) **Process-I A/c**

Particulars	Units	(₹)	Particulars	Units	(₹)
To Opening W.I.P:					
— Materials	3,000	1,80,500	By Normal Loss(₹ 62.5 × 1,800 units)	1,800	1,12,500
— Labour	--	32,400			
— Overheads	--	90,000			
To Materials introduced	42,000	36,04,000	By Abnormal loss	3,000	3,64,200
To Labour		4,50,000	By Process-I A/c	36,000	49,32,000
To Overheads		15,18,000	By Closing WIP	4,200	4,66,200
	45,000	58,74,900		45,000	58,74,900

(iv) **Normal Loss A/c**

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-I A/c	1,800	1,12,500	By Cost Ledger Control A/c	1,800	1,12,500
	1,800	1,12,500		1,800	1,12,500

(v) **Abnormal Loss A/c**

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-I A/c	3,000	3,64,200	By Cost Ledger Control A/c (₹ 62.5 × 3,000 units)	3,000	1,87,500
			By Costing Profit & Loss A/c (Bal. Figure)		1,76,700
	3,000	3,64,200		3,000	3,64,200

Q.77

Process a/c prepare

PY July 21



A Manufacturing unit manufactures a product 'XYZ' which passes through three distinct Processes - X, Y and Z. The following data is given:

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

- The total Production Overhead of ₹ 15,750 was recovered @ 150% of Direct wages.
- 15,000 units at ₹ 2 each were introduced to Process 'X'.
- The output of each process passes to the next process and finally, 12,000 units were transferred to Finished Stock Account from Process 'Z'.

- No stock of materials or work in progress was left at the end.

The following additional information is 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:

- 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.
- Prepare Process accounts for all the three processes X, Y and Z.

Ans.

Process-X Account

Dr.			Cr.		
Particulars	Units	(₹)	Particulars	Units	(₹)
To Material introduced	15,000	30,000	By Normal Loss A/c [(6% of 15,000 units) × ₹ 1.1]	900	990
" Additional material	--	2,600	" Process-Y A/c (₹ 2.951* × 14,100 units)	14,100	41,610
" Direct wages	--	4,000			
" Production OH	--	6,000			
	15,000	42,600		15,000	42,600

*Cost per unit of completed units

$$= \frac{\text{Total cost} - \text{Realisable value from normal loss}}{\text{Input units} - \text{Normal loss units}} = \frac{42,600 - 990}{15,000 \text{ units} - 900 \text{ units}} = 2.951$$

Dr.			Process-Y Account		Cr.
Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-X A/c	14,100	41,610	By Normal Loss A/c	1,895	3,790
" Additional material	--	2,250	[(#13.44% of 14,100 units) × ₹ 2]	12,205	48,820
" Direct wages	--	3,500	" Process-Z A/c		
" Production OH	--	5,250	(₹ 4 × 12,205 units)		
	14,100	52,610		14,100	52,610

*Calculation for % of wastage in process 'Y':

Let's consider number of units lost under process 'Y' = A

$$\text{Now, } \frac{\text{Total cost} - \text{Realisable value from normal loss}}{\text{Input units} - \text{Normal loss units}} = 4$$

$$\frac{52,610 - 2A}{14,100 \text{ units} - A} = 4$$

$$2A = 3,790 \Rightarrow A = 1,895 \text{ units}$$

$$\% \text{ of wastage} = \frac{1,895 \text{ units}}{14,100 \text{ units}} = 13.44\%$$

Dr.

Process-Z Account

Cr.

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-Y A/c	12,205	48,820	By Normal Loss A/c	610	610
" Additional material	--	2,000	[(5% of 12,205 units) × ₹ 1]	12,000	59,726
" Direct wages	--	3,000	Finished Stock A/c (₹ 4.9771\$ × 12,000 units)		
" Production OH	405	2,016			
" Abnormal gain (₹ 4.9771\$ × 405 units)	12,610	60,336		12,610	60,336

Cost per unit of completed units

$$= \frac{\text{Total cost} - \text{Realisable value from normal loss}}{\text{Input units} - \text{Normal loss units}} = \frac{58,320 - 610}{12,205 \text{ units} - 610 \text{ units}} = 4.9771$$

Alternative Solution

Dr. Process-X Account			Cr.		
Particulars	Units	(₹)	Particulars	Units	(₹)
To Material introduced	15,000	30,000	By Normal Loss A/c	900	990
" Additional material	--	2,600	[(6% of 15,000 units) × ₹1.1]		
" Direct wages	--	4,000	Process-Y A/c (₹ 2.951* × 14,100 units)	14,100	41,610
" Production OH	--	6,000			
	15,000	42,600		15,000	42,600

*Cost per unit of completed units

$$\frac{\text{Total cost} - \text{Realisable value from normal loss}}{\text{Inputs units} - \text{Normal loss units}} = \frac{42,600 - 990}{15,000 \text{ units} - 900 \text{ units}} = 2.951$$

Dr. Process-Y Account			Cr.		
Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-X A/c	14,100	41,610	By Normal Loss A/c	1,895	3,790
" Additional material	--	2,250	[(#13.44% of 14,100 units) × ₹ 2]	12,631	50,524
" Direct wages	--	3,500	Process-Z A/c (₹ 4 × 12,631@ units)		
" Production OH	--	5,250			
" Abnormal gain (₹ 4 × 426 units)	426	1,704			
	14,526	54,314		14,526	54,314

Working Notes:

- Units Transferred from Process Z Account to Finished Stock = 12,000 Units i.e 95% of Inputs.
So, Input of Z or Output of Y is $12,000 \times 100/95 = 12,631$ Units and Normal Loss (5%) is 631 units.
- Let's consider number of units lost under process 'Y' as:

For Normal loss = A

For Abnormal loss = B

Now, $A + B = 1,469$ [i.e. $14,100 - 12,631$] ... (I)

$(A \times ₹ 2 \text{ per unit}) + (B \times ₹ 4 \text{ per unit}) = [52,610 - 50,524]$

$2A + 4B = 2,086$... (II)

Now, putting the values of (I) in (II), we get, $2(1,469 - B) + 4B = 2,086$

$2,938 - 2B + 4B = 2,086$

$2B = -852 \Rightarrow B = -426 \text{ units}$

Since, the figure of B is in negative, it is an abnormal gain of 426 units. Further, A (i.e. normal loss) = $1,469 + 426 = 1,895 \text{ units}$

3. % of wastage in Process Y Account = $\frac{1,895}{14,100 \text{ units}} = 13.44\%$

Dr.		Process-Z Account		Cr.	
Particulars	Units	(₹)	Particulars	Units	(₹)
To Process-Y A/c	12,631	50,524	By Normal Loss A/c	631	631
" Additional material	--	2,000	[(5% of 12,631 units)		
" Direct wages	--	3,000	$\times ₹ 1]$		
" Production OH	--	4,500		12,000	59,393
	12,631	60,024	Finished Stock A/c	12,631	60,024
			$(₹ 4.9494^{\$} \times 12,000 \text{ units})$		

Cost per unit of completed units = $\frac{\text{Total cost} - \text{Realisable value from normal loss}}{\text{Input units} - \text{Normal loss units}}$

= $\frac{60,024 - 631}{12,631 \text{ units} - 631 \text{ units}} = 4.9494$

Q.78

Process a/c abnormal loss

PY May 22



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:

- Prepare Statement of Equivalent production and determine the cost per kg. of Chemical 'G' in Process I using the weighted average cost method.
- Prepare a statement showing cost of Chemical 'G' transferred to Process II, cost of abnormal loss and cost of closing work-in progress.
- 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?

Ans. (i) **Statement of Equivalent Production**

Particulars	Input quantity	Particulars	Total	Material		Processing Cost	
				%	Units	%	Units
Opening WIP	9,500	Units completed	83,000	100%	83,000	100%	83,000
Material Input	1,05,000	Normal loss (10% of 1,05,000)	10,500	-	-	-	-
		Abnormal loss (Bal. fig.)	4,500	100%	4,500	100%	4,500
		Closing WIP	16,500	100%	16,500	60%	9,900
	1,14,500		1,14,500		1,04,000		97,400

Statement of Cost for each element

Particulars	Material	Processing	Total cost
	(₹)	(₹)	(₹)
Cost of opening WIP	29,500	14,750	44,250
Cost incurred during the month	3,34,500	2,53,100	5,87,600
Total cost (A)	3,64,000	2,67,850	6,31,850
Equivalent production (B)	1,04,000	97,400	
Cost per kg of Chemical 'G' (A/B)	3.5	2.75	6.25

Alternative Presentation

Statement showing cost per kg of each statement

	(₹)	(₹)
Material	29,500 + 3,34,500	3.5

	1,04,000	
Processing cost	$\frac{14,750 + 2,53,100}{97,400}$	2.75
Total Cost per kg		6.25

- (ii) Statement showing cost of Chemical 'G' transferred to Process II, cost of abnormal loss and cost of closing work-in- progress

	(₹)
Units transferred (60,000 × 6.25)	3,75,000
Abnormal loss (4,500 × 6.25)	28,125
Closing work in progress:	
Material (16,500 × 3.5)	57,750
Processing cost (9,900 × 2.75)	27,225
	84,975

- (iii) Calculation of Incremental Profit / Loss after further processing

Particulars	(₹)	(₹)
Sales if further processed (A) (60,000 × 1.20 × ₹ 10)	7,20,000	
Calculation of cost in Process II		
Chemical transferred from Process I	3,75,000	
Add: Material cost	85,000	
Add: Process cost	50,000	
Total cost of finished stock (B)	5,10,000	
Profit, if further processed (C = A - B)		2,10,000
If sold without further processing then,		
Sales (60,000 × ₹ 9)	5,40,000	
Less: Cost of input without further processing	3,75,000	
Profit without further processing (D)		1,65,000
Incremental Profit after further processing (C - D)		45,000
Additional net profit on further processing in Process II is 45,000. Therefore, it is advisable to process further chemical 'G'.		

Alternative Presentation

Calculation of Incremental Profit / Loss after further processing

	(₹)
If 60,000 units are sold @ ₹ 9	5,40,000
If 60,000 units are processed in process II (60,000 × 1.2 × ₹ 10)	7,20,000
Incremental Revenue (A)	1,80,000
Incremental Cost: (B)	
Material Cost	85,000
Processing Cost	50,000
	1,35,000
Incremental Profit (A-B)	45,000

Additional net profit on further processing in Process II is 45,000. Therefore, it is advisable to process further chemical 'G'.

Q.79

Process iii a/c

RTP Nov 18



From the following information for the month of January, 20X9, PREPARE Process-III cost accounts.

Opening WIP in Process-III	1,600 units at ₹ 24,000
Transfer from Process-II	55,400 units at ₹ 6,23,250
Transferred to warehouse	52,200 units
Closing WIP of Process-III	4,200 units
Units Scrapped	600 units
Direct material added in Process-III	₹ 2,12,400
Direct wages	₹ 96,420
Production overheads	₹ 56,400

Degree of completion:

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

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

(Students may treat material transferred from Process - II as Material - A and fresh material used in Process - III as Material B)

Ans.

Statement of Equivalent Production
Process III

Input Details	Units	Output Particulars	Units	Equivalent Production					
				Material-A		Material-B		Labour & Overhead	
				%	Units	%	Units	%	Units
Opening WIP	1,600	Work on Op. WIP	1,600	-	-	20	320	40	640
Process-II Transfer	55,400	Introduced & completed during the month	50,600	100	50,600	100	50,600	100	50,600
		Normal loss (5% of 52,800 units)	2,640	-	-	-	-	-	-
		Closing WIP	4,200	100	4,200	70	2,940	50	2,100
		Abnormal Gain	(2,040)	100	(2,040)	100	(2,040)	100	(2,040)
	57,000		57,000		52,760		51,820		51,300

Working note:

Production units = Opening units + Units transferred from Process-II - Closing Units

= 1,600 units + 55,400 units - 4,200 units

= 52,800 units

Statement of Cost

	Cost (₹)	Equivalent units	Cost per equivalent units (₹)
Material A (Transferred from previous process)	6,23,250		
Less: Scrap value of normal loss (2,640 units × ₹ 5)	(13,200)		
	6,10,050	52,760	11.5627
Material B	2,12,400	51,820	4.0988
Labour	96,420	51,300	1.8795
Overheads	56,400	51,300	1.0994
	9,75,270		18.6404

		Amount (₹)	Amount (₹)
Opening WIP	Material A		24,000
Completed opening WIP units-1600	Material B (320 units × ₹ 4.0988)	1311.62	
	Wages (640 units × ₹ 1.8795)	1202.88	
	Overheads (640 units × ₹ 1.0994)	703.62	3,218.12
Introduced & Completed- 50,600 units	50,600 units × ₹ 18.6404		9,43,204.24
Total cost of 52,200 finished goods units			9,70,422.36
Closing WIP units- 4,200	Material A (4,200 units × ₹ 11.5627)		48,563.34
	Material B (2,940 units × ₹ 4.0988)		12,050.47
	Wages (2,100 units × ₹ 1.8795)		3,946.95
	Overheads (2,100 units × ₹ 1.0994)		2,308.74
			66,869.50
Abnormal gain units - 2,040	(2,040 units × ₹ 18.6404)		38026.42

Process III A/c

Particulars	Units	Amount (₹)	Particulars	Units	Amount (₹)
To Balance b/d	1,600	24,000	By Normal loss	2,640	13,200
To Process II A/c	55,400	6,23,250	By Finished goods	52,200	9,70,422.36
To Direct material		2,12,400	By Closing WIP	4,200	66,874.06*
To Direct wages		96,420			
To Production		56,400			

overheads					
To Abnormal gain	2,040	38,026.42			
	59,040	10,50,496.42		59,040	10,50,496.42

* Difference in figure due to rounding off has been adjusted with closing WIP

Q. 80

Process I /II/II account

RTP Nov 20



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 2020 is as follows:

	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 No. of units produced:

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

There is not stock at the beginning and end of the month.

You are required to PREPARE accounts for:

- Process-I, II and III
- By-product process.

Ans.

(i) Process-I A/c

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

$$\star \frac{(3,42,000 - 3,500)}{(7,000 - 350) \text{ units}} = 50.9022$$

Particulars	Units	Amt. (₹)	Particulars	Units	Amt. (₹)
To Process-I A/c	6,600	3,35,955	By Normal loss (10% of 6,600)	660	6,600
To Other materials	-	1,36,000	By Process-III**	5,200	5,63,206
To Direct wages	-	54,000	By Abnormal loss**	740	80,149
To Direct expenses	-	16,000			
To Production OH (200% of ₹54,000)	-	1,08,000			
	6,600	6,49,955		6,600	6,49,955

$$\frac{** (6,49,955 - 6,600)}{(6,600 - 660) \text{ units}} = 180.1396$$

$$\# \text{ Realisable value} = ₹135 - (85 + 15) = ₹35$$

(ii) By-Product Process A/c

Particulars	Units	Amt. (₹)	Particulars	Units	Amt. (₹)
To Process-III A/c	600	21,000	By Product-Z	600	81,000
To Processing cost	-	51,000			
To Selling expenses	-	9,000			
				600	81,000
	600	81,000		600	81,000

Q.81

Process I/II/Abnormal Loss

MTP May 19(1)



Aditya Agro Ltd. mixes powdered ingredients in two different processes to produce one product. The output of Process-I becomes the input of Process-II and the output of Process-II is transferred to the Packing department.

From the information given below, you are required to PREPARE accounts for Process-I, Process-II and Abnormal loss/ gain A/c to record the transactions for the month of February 20X9.

Process-I

Input:	
Material A	6,000 kilograms at Rs. 50 per kilogram
Material B	4,000 kilograms at Rs. 100 per kilogram
Labour	430 hours at Rs. 50 per hour
Normal loss	5% of inputs. Scrap are disposed off at Rs.16 per kilogram
Output	9,200 kilograms.

There is no work-in- process at the beginning or end of the month.

Process-II

Input:	
Material C	6,600 kilograms at Rs. 125 per kilogram
Material D	4,200 kilograms at Rs. 75 per kilogram
Flavouring Essence	Rs. 3,300
Labour	370 hours at Rs.50 per hour
Normal loss	5% of inputs with no disposal value
Output	18,000 kilograms.

There is no work-in-process at the beginning of the month but 1,000 kilograms in process at the end of the month and estimated to be only 50% complete so far as labour and overhead were concerned. Overhead of Rs. 92,000 incurred to be absorbed on the basis of labour hours.

Ans.

Particulars	Qty. (kgs)	Amount)	Particulars	Qty (kgs)	Amount (Rs.)
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To Material A	6,000	3,00,000	By Normal loss	500	8,000
To Material B	4,000	4,00,000	By Process-II A/c	9,200	7,38,857
To Labour	--	21,500	By Abnormal loss A/c	300	24,093
To Overhead $\left(\frac{92,000 \times 430 \text{hrs}}{800 \text{hrs}}\right)$	--	49,450			
	10,000	7,70,950		10,000	7,70,950

$$\frac{*[(3,00,000 + 4,00,000 + 21,500 + 49,450) - 8,000]}{(10,000 - 500) \text{units}} = \frac{7,70,950 - 8,000}{9,500 \text{units}} = 80,3105$$

Particulars	Qty (kgs)	Amount (Rs.)	Particulars	Qty. (kgs)	Amount (Rs.)
To Process-I A/c	9,200	7,38,857	By Normal loss	1,000	--
To Material C	6,600	8,25,000	By Packing Dept. A/c (See the working notes)	18,000	18,42,496
To Material D	4,200	3,15,000	By WIP A/c (See the working notes)	1,000	1,00,711
To Flavouring essence	--	3,300			
To Labour	--	18,500			
To Overheads $\left(\frac{92,000 \times 370 \text{hrs}}{800 \text{hrs}}\right)$	--	42,550			
	20,000	19,43,207		20,000	19,43,207

Abnormal loss A/c

Particulars	Qty. (kgs)	Amount (Rs.)	Particulars	Qty. (kgs)	Amount (Rs.)
To Process-I A/c	300	24,093	By Bank	300	4,800
			By Costing Profit & Loss A/c	--	19,293
	300	24,093		300	24,093

Working Notes:

Calculation of Equivalent Production units

Input	Units	Output	Units	Process-I		Mat-C & D		Labour & OH	
				(%)	Units	(%)	Units	(%)	Units
	9,200	Transferred to	18,000	100	18,000	100	18,000	100	18,000

		Packing.							
Mat-C	6,600	Closing WIP	1,000	100	1,000	100	1,000	50	500
Mat-D	4,200	Normal loss	1,000	--	--	--	--	--	--
	20,000		20,000		19,000		19,000		18,500

Calculation of Unit cost

Cost component	Amount (Rs.)	Equivalent units	Cost per unit (Rs.)
Transferred-in	7,38,857	19,000	38.8872
Material-C	8,25,000	19,000	43.4211
Material-D	3,15,000	19,000	16.5789
Flavouring essence	3,300	19,000	0.1737
Total Material Cost	18,82,157	19,000	99.0609
Labour	18,500	18,500	1.0000
Overheads	42,550	18,500	2.3000
Total Cost	19,43,207		102.3609

Value of Materials transferred to Packing Department

= 18,000 unit × Rs.102.3609 = 18,42,496

Value of WIP : For Materials- 1,000 units × Rs.99.0609 = Rs.99,061 For Labour & Overheads 500 units × Rs.3.30 = Rs.1,650

Rs.1,00,711

Q.82

Eq. Production / Cost Per unit

MTP May 19(2)

The following data are available in respect of Process-I for January 20X9:

- (1) Opening stock of work in process: 600 units at a total cost of Rs. 4,20,000.
- (2) Degree of completion of opening work in process:

Material	100%
Labour	60%
Overheads	60%
- (3) Input of materials at a total cost of Rs.55,20,000 for 9,200 units.
- (4) Direct wages incurred Rs.18,60,000
- (5) Production overhead Rs.8,63,000.
- (6) Units scrapped 200 units. The stage of completion of these units was:

Materials	100%
Labour	80%
Overheads	80%
- (7) Closing work in process; 700 units. The stage of completion of these units was:

Material	100%
Labour	70%
Overheads	70%
- (8) 8,900 units were completed and transferred to the next process.
- (9) Normal loss is 4% of the total input (opening stock plus units put in)
- (10) Scrap value is Rs.60 per unit. You are required to:
 - (i) COMPUTE equivalent production,

- (ii) CALCULATE the cost per equivalent unit for each element.
- (iii) CALCULATE the cost of abnormal loss (or gain), closing work in process and the units transferred to the next process using the FIFO method.

Ans. (i) Statement of Equivalent Production (FIFO Method)

Input		Output		Equivalent Production					
				Materials		Labour		Production Overhead	
Details	Units	Details	Units	%	Units	%	Units	%	Units
Opening Stock	600	From opening stock	600	-	-	40	240	40	240
		- From fresh materials	8,300	100	8,300	100	8,300	100	8,300
		Closing W-I-P	700	100	700	70	490	70	490
Fresh inputs	9,200	Normal loss	392	-	-	-	-	-	-
			9,992		9,000		9,030		9,030
		Less: Abnormal Gain	(192)	100	(192)	100	(192)	100	(192)
	9,800		9,800		8,808		8,838		8,838

(ii) Statement of Cost per equivalent units

Elements	(Rs.)	Cost (Rs.)	Equivalent units (EU)	Cost per EU (Rs.)
Material Cost	55,20,000			
Less: Scrap realisation 392 units @ Rs. 60/- p.u.	(2,3520)	54,96,480	8,808	624.03
Labour cost		18,60,000	8,838	210.45
Production OH Cost		8,63,000	8,838	97.65
Total Cost		82,19,480		932.13

(iii) Cost of Abnormal Gain - 192 Units

	(Rs.)	(Rs.)
Material cost of 192 units @ Rs. 624.03 p.u.	1,19,813.76	
Labour cost of 192 units @ Rs. 210.45 p.u.	40,406.40	
Production OH cost of 192 units @ Rs. 97.65 p.u.	18,748.80	1,78,968.96

Cost of closing WIP - 700 Units

Material cost of 700 equivalent units @ Rs. 624.03p.u.	4,36,821.00	
Labour cost of 490 equivalent units @ Rs. 210.45 p.u.	1,03,120.50	
Production OH cost of 490 equivalent @ Rs. 97.65p.u.	47,848.50	5,87,790.00

Cost of 8,900 units transferred to next process

(i) Cost of opening W-I-P Stock b/f - 600 units	4,20,000.00
(ii) Cost incurred on opening W-I-P stock	
Material cost —	
Labour cost 240 equivalent units @ Rs. 210.45 p.u.	50,508.00
Production OH cost 240 equivalent units @ Rs 97.65 p.u.	<u>23,436.00</u>
	4,93,944.00
(iii) Cost of 8,300 completed units	
8,300 units @ Rs. 932.13 p.u.	77,36,679.00
Total cost [(i) + (ii) + (iii)]	86,50,623.00

Q.83

MTP May 25(1)



PR Ltd., a leading chemical company specializing in the production of specialty chemicals and industrial products, manufactures Product X through two distinct processes – Process-I and Process-II. Known for its innovation in chemical manufacturing, the company uses advanced technologies and industry best practices to ensure high-quality production. The following information is provided from the books of account for the year:

Particulars	Process- I	Process- II
Raw materials used	1,50,000 units	--
Raw materials cost per unit	₹ 400	--
Actual Output	1,38,000 units	96,000 units
Output transferred to next process	3/4th	--
Output sold	1/4th	96,000 units
Normal loss (on inputs)	6%	10%
Direct wages	₹ 39,00,000	₹ 58,50,000
Direct Expenses	20% of Direct wages	15% of Direct wages
Manufacturing overheads	₹ 2,25,00,000 to be recovered as a percentage of direct wages	
Realisable value of scrap per unit	₹ 25	₹ 40
Selling price per unit of output	₹ 650	₹ 950

Management & Selling expenses of ₹ 1,27,50,000 are directly attributable to the Costing Profit & Loss Account. You are required to PREPARE the following:

- Process-I Account
- Process-II Account
- Abnormal Loss
- Abnormal Gain Account
- Costing Profit & Loss Account

Ans.

Process- I A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Raw material used (₹ 400 × 1,50,000 units)	1,50,000	6,00,00,000	By Normal loss (6% of 1,50,000 units) × ₹ 25	9,000	2,25,000
To Direct wages	--	39,00,000	By Process- II A/c (₹ 520.96 × 1,03,500 units)	1,03,500	5,39,19,360



To Direct expenses (20% of Direct wages)	--	7,80,000	By Abnormal loss (₹ 520.96 × 3,000 units)	3,000	15,62,880
To Manufacturing overhead [₹ 2,25,00,000 × (390/975)]		90,00,000	By Costing Profit and Loss (P&L)	34,500	1,79,72,760
	1,50,000	7,36,80,000		1,50,000	7,36,80,000

Cost per unit:

$$\left(\frac{\text{Total Cost} - \text{Realisable value of normal loss}}{\text{Total input units} - \text{Normal Loss units}} \right)$$

$$= \left(\frac{₹ 7,36,80,000 - ₹ 2,25,000}{1,50,000 \text{ units} - 9,000 \text{ units}} \right)$$

= ₹ 520.96 per unit

Process- II A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process- I A/c	1,03,500	5,39,19,360	By Normal loss (10% of 1,03,500 units) × ₹ 40	10,350	4,14,000
To Direct wages	--	58,50,000	By Costing P & L A/c	96,000	7,59,88,778
To Direct expenses (15% of Direct wages)	--	8,77,500			
To Manufacturing overhead [₹ 2,25,00,000 × (585/975)]	--	1,35,00,000			
To Abnormal gain	2,850	22,55,918			
(₹ 791.55 × 2,850 units)	1,06,350	7,64,02,778		1,06,350	7,64,02,778

Cost per unit:

$$\left(\frac{\text{Total Cost} - \text{Realisable value of normal loss}}{\text{Total input units} - \text{Normal Loss units}} \right)$$

$$= \left(\frac{₹ 7,41,46,860 - ₹ 4,14,000}{1,03,500 \text{ units} - 10,350 \text{ units}} \right)$$

= ₹ 791.55 per unit

Abnormal Loss A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Process- I A/c	3,000	15,62,880	By Bank	3,000	75,000
			By Costing P & L A/c		14,87,880
	3,000	15,62,880		3,000	15,62,880

Abnormal Gain A/c

Particulars	Units	(₹)	Particulars	Units	(₹)
To Normal Loss	2,850	1,14,000	By Process- II A/c	2,850	22,55,918
To Costing P & L A/c		21,41,918			
	2,850	22,55,918		2,850	22,55,918

Costing Profit & Loss Account

Particulars	(₹)	Particulars	(₹)
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To Cost of sales	9,39,61,538	By Sales	
Process I- 1,79,72,760		Process I- 34,500 @ 650	11,36,25,000
Process II- 7,59,88,778		Process II- 96,000 @ 950	
To Abnormal loss	14,87,880	By Abnormal gain	21,41,918
To Selling Expenses	1,27,50,000		
To Net Profit	75,67,500		
	11,57,66,918		11,57,66,918

**10**

CHAPTER

BUDGET AND BUDGETORY CONTROL

Q.84

Budget Ratio

PY May 19



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 week	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 four weeks. Calculate the following Ratios :

- Efficiency Ratio
- Activity Ratio
- Standard Capacity Usage Ratio
- Actual Capacity Usage Ratio
- Actual Usage of Budgeted Capacity Ratio

Ans.

(i) **Efficiency Ratio:**

$$= \frac{\text{Standard Hrs}}{\text{Actual Hrs}} \times 100 = \frac{8800 \text{ hours}}{7500 \text{ hours}} \times 100 = 117.33\%$$

(ii) **Activity Ratio:**

$$= \frac{\text{Standard Hrs}}{\text{Budgeted Hrs}} \times 100 = \frac{8800 \text{ hours}}{8000 \text{ hours}} \times 100 = 110\%$$

(iii) **Standard Capacity Usage Ratio:**

$$= \frac{\text{Budgeted Hours}}{\text{Max. possible hours in the budgeted period}} \times 100$$

$$= \frac{8000 \text{ hours}}{9600 \text{ hours}} \times 100 = 83.33\%$$

(iv) **Actual Capacity Usage Ratio:**

$$= \frac{\text{Actual Hours worked}}{\text{Max. possible working hours in a period}} \times 100$$

$$= \frac{7500 \text{ hours}}{9600 \text{ hours}} \times 100 = 78.125\%$$

(v) **Actual Usage of Budgeted Capacity Ratio:**

$$= \frac{\text{Actual working Hours}}{\text{Budgeted Hours}} \times 100 = \frac{7500 \text{ hours}}{8000 \text{ hours}} \times 100 = 93.75\%$$

Working Notes:

- Maximum Capacity in a budget period
= 60 Employees × 8 Hrs. × 5 Days × 4 Weeks = 9,600 Hrs.
- Budgeted Hours (Hrs)
= 50 Employees × 8 Hrs. × 5 Days × 4 Weeks = 8,000 Hrs.

3. Actual Hrs. = 7,500 Hrs. (given)
4. Standard Hrs. for Actual Output = 8,800 Hrs.

Q.85

Sales/ Production/ Rm budget

PY July 21



PSV Ltd. manufactures and sells a single product and estimated the following related information for the period November, 2020 to March, 2021.

Particulars	November, 2020	December, 2020	January, 2021	February, 2021	March, 2021
Opening Stock of Finished Goods (in Units)	7,500	3,000	9,000	8,000	6,000
Sales (in Units)	30,000	35,000	38,000	25,000	40,000
Selling Price per unit (in ₹)	10	12	15	15	20

Additional Information:

- Closing stock of finished goods at the end of March, 2021 is 10,000 units.
 - Each unit of finished output requires 2 kg of Raw Material 'A' and 3 kg of Raw Material 'B'.
- You are required to prepare the following budgets for the period November, 2020 to March, 2021 on monthly basis:
- (i) Sales Budget (in ₹)
 - (ii) Production budget (in units) and
 - (iii) Raw material Budget for Raw material 'A' and 'B' separately (in units)

Ans.

(i) Sales Budget (in ₹)

Particulars	Nov, 20	Dec, 20	Jan, 21	Feb, 21	Mar, 21	Total
Sales (in Units)	30,000	35,000	38,000	25,000	40,000	1,68,000
Selling Price per unit (₹)	10	12	15	15	20	-
Total Sales (₹)	3,00,000	4,20,000	5,70,000	3,75,000	8,00,000	24,65,000

(ii) Production Budget (in units)

Particulars	Nov, 20	Dec, 20	Jan, 21	Feb, 21	Mar, 21	Total
Sales	30,000	35,000	38,000	25,000	40,000	1,68,000
Add: Closing stock of finished goods	3,000	9,000	8,000	6,000	10,000	36,000
Total quantity required	33,000	44,000	46,000	31,000	50,000	2,04,000
Less: Opening stock of finished goods	7,500	3,000	9,000	8,000	6,000	33,500
Units to be produced	25,500	41,000	37,000	23,000	44,000	1,70,500

(iii) Raw material budget (in units) For Raw material 'A'

Particulars	Nov, 20	Dec, 20	Jan, 21	Feb, 21	Mar, 21	Total
Units to be produced: (a)	25,500	41,000	37,000	23,000	44,000	1,70,500
Raw material consumption p.u. (kg.): (b)	2	2	2	2	2	-
Total raw material consumption (Kg.): (a × b)	51,000	82,000	74,000	46,000	88,000	3,41,000

For Raw material 'B'

Particulars	Nov, 20	Dec, 20	Jan, 21	Feb, 21	Mar, 21	Total
Units to be produced: (a)	25,500	41,000	37,000	23,000	44,000	1,70,500



Raw material consumption p.u. (kg.): (b)	3	3	3	3	3	-
Total raw material consumption (Kg.): (a × b)	76,500	1,23,000	1,11,000	69,000	1,32,000	5,11,500

Q.86

Flexible budget

PY Dec 21



The Accountant of KPMR Ltd. has prepared the following budget for the coming year 2022 for its two products 'AYE' and 'ZYE':

Particulars	Product 'AYE'	Product 'ZYE'
Production and Sales (in Units)	4,000	3,000
	Amount (in ₹)	Amount (in ₹)
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:

- Before promotion on social media,
- After promotion on social media.

Ans.

- Flexible Budget (before promotion)

	Particulars	Product 'AYE'	Product 'ZYE'	Total
	Production & Sales (units)	4,000	3,000	
		Amount (₹)	Amount (₹)	Amount (₹)
A.	Sales Value	8,00,000 (₹ 200 × 4,000)	5,40,000 (₹ 180 × 3,000)	13,40,000
B.	Direct Materials	3,20,000 (₹ 80 × 4,000)	2,10,000 (₹ 70 × 3,000)	5,30,000
C.	Direct labour	1,60,000 (₹ 40 × 4,000)	1,05,000 (₹ 35 × 3,000)	2,65,000
D.	Variable Overheads	80,000 (₹ 20 × 4,000)	75,000 (₹ 25 × 3,000)	1,55,000
E.	Total Variable Cost (B+C+D)	5,60,000	3,90,000	9,50,000
F.	Contribution (A-E)	2,40,000	1,50,000	3,90,000
G.	Fixed Overhead	40,000 (₹ 10 × 4,000)	30,000 (₹ 10 × 3,000)	70,000
H.	Profit (F-G)	2,00,000	1,20,000	3,20,000

Profit per unit	50	40
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(ii) Flexible Budget (after promotion)

	Particulars	Product 'AYE'	Product 'ZYE'	Total
	Production & Sales (units)	4,200 (4,000×105%)	3,150 (3,000×105%)	
		Amount (₹)	Amount (₹)	Amount (₹)
A.	Sales Value	9,24,000 (₹ 220 × 4,200)	6,23,700 (₹ 198 × 3,150)	15,47,700
B.	Direct Materials	3,36,000 (₹ 80 × 4,200)	2,20,500 (₹ 70 × 3,150)	5,56,500
C.	Direct labour	1,68,000 (₹ 40 × 4,200)	1,10,250 (₹ 35 × 3,150)	2,78,250
D.	Variable Overheads	1,00,800 (₹ 24 × 4,200)	94,500 (₹ 30 × 3,150)	1,95,300
E.	Total Variable Cost (B+C+D)	6,04,800	4,25,250	10,30,050
F.	Contribution (A-E)	3,19,200	1,98,450	5,17,650
G.	Fixed Overhead	42,000 (₹ 40,000 × 105%)	31,500 (₹ 30,000 × 105%)	73,500
H.	Profit (F-G)	2,77,200	1,66,950	4,44,150
	Profit per unit	66	53	

Q. 87

Sales & Prodn Budget

PY May 22



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:

	Shirt (₹)	Short (₹)
Sales price	60	44
Raw Materials		
Fabric @12 per metre	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:
- 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.
 - Prepare the following budgets on a monthly basis for July, August and September 2022:
 - Sales budget showing sales units and sales revenue for each product.
 - Production budget (in units) for each product.

Ans.**I. Calculation of number of shirts & shorts to be produced per month:**

Contribution per labour hour:

		Shirts (₹)	Shorts (₹)
A	Sales Price per unit	60	44
B	Variable Cost:		
	- Raw materials	30	16
	- Direct labour	8	4
		38	20
C	Contribution per unit [A-B]	22	24
D	Labour hour per unit	1 hour	0.5 hour
E	Contribution per labour hour [C÷D]	22	48

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. The quantity will be determined as below:

Let the Quantity of Shorts be X and Shirts will be 0.25 X, then

(Qty. of Shorts × labour hour per unit) + (Qty. of Shirts × labour hour per unit) = Total labour hours available

Or, $(X \times 0.5 \text{ hour}) + (0.25X \times 1 \text{ hour}) = 12,000 \text{ hours}$

Or, $0.5X + 0.25X = 12,000$ Or, $0.75X = 12,000$

Or, $X = 12,000 \div 0.75$

= **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

II. (i) Sales Budget for the month of July, August & September 2022:

		July 2022		August 2022		September 2022	
		Shirts	Shorts	Shirts	Shorts	Shirts	Shorts
A	Sales demand	15,000	20,000	16,500	22,000	18,150	24,200
B	Selling price per unit (₹)	60	44	60	44	60	44
C	Sales Revenue (₹)	9,00,000	8,80,000	9,90,000	9,68,000	10,89,000	10,64,800

(ii) Production budget for the month of July, August & September 2022:

		July 2022		August 2022		September 2022		October 2022	
		Shirts	Shorts	Shirts	Shorts	Shirts	Shorts	Shirts	Shorts

A	Opening stock	0	0	6,600	8,800	7,260	9,680		
B	Sales demand	15,000	20,000	16,500	22,000	18,150	24,200	19,965	26,620
C	Closing stock	6,600	8,800	7,260	9,680	7,986	10,648		
D	Production [B+C-A]	21,600	28,800	17,160	22,880	18,876	25,168		

Q.88

Current Year & next year

PY May 23



PQR Limited manufactures three products - Product 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 Material Cost (Per unit)	₹ 20	₹ 20	₹ 20
Direct Wages Cost (per unit)	₹ 16	₹ 24	₹ 16

Raw material 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 hour 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 opening and closing stock. Selling Price per unit of each product will remain unchanged in the next year.

Required:

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.

Ans.

(i) Budget showing current position of total product wise contribution and profitability

	Particulars	Product X (₹)	Product Y (₹)	Product Z (₹)	Total (₹)
A	Direct material cost (per unit)	20	20	20	
B	Direct wages cost (per unit)	16	24	16	
C	Variable overhead per unit (Refer WN-1)	4	6	4	
D	Total variable cost/ Marginal cost per unit [A+B+C]	40	50	40	
E	Add: Profit [20% of D]	-	-	8	
F	Selling price unit [D+E]	-	-	48	
G	Price weight	1.25	2	1	
H	Selling price per unit [Selling price of Product Z × G]	60	96	48	
I	Contribution per unit [H-D]	20	46	8	



J	Quantity to be sold	2,50,000	2,80,000	3,20,000	
K	Total Contribution [J×I]	50,00,000	1,28,80,000	25,60,000	2,04,40,000
L	Fixed Overheads [Refer WN-1]				13,20,000
M	Profit				1,91,20,000

Working Notes:**1. Segregation of Overheads into variable and fixed in current year**

	Particulars	Product X (₹)	Product Y (₹)	Product Z (₹)	Total (₹)
A	Total overhead cost	-	-	-	52,80,000
B	Labour hour per unit [Direct wages Cost ÷ Re.1]	4	6	4	
C	Quantity produced	2,50,000	2,80,000	3,20,000	
D	Total variable overhead cost [B×C]	10,00,000	16,80,000	12,80,000	39,60,000
E	Fixed overhead cost[A-D]				13,20,000

(ii) Budget showing next year's position of total product wise contribution and Profitability

	Particulars	Product X (₹)	Product Y (₹)	Product Z (₹)	Total (₹)
A	Selling price per unit	60	96	48	
B	Contribution per unit	20	46	8	
C	Quantity to be sold	2,80,000 [112% of 2,50,000]	2,66,000 [95% of 2,80,000]	3,68,000 [115% of 3,20,000]	
D	Total Contribution [B×C]	56,00,000	1,22,36,000	29,44,000	2,07,80,000
	Fixed Overheads [Refer WN 2]				13,20,000
	Profit				1,94,60,000

Working Notes:**2. Segregation of Overheads into variable and fixed in next year**

	Particulars	Product X (₹)	Product Y (₹)	Product Z (₹)	Total (₹)
A	Total overhead cost	-	-	-	55,08,000
B	Labour hour per unit [Direct wages Cost ÷ Re.1]	4	6	4	
C	Quantity produced	2,80,000	2,66,000	3,68,000	
D	Total variable overhead cost [B×C]	11,20,000	15,96,000	14,72,000	41,88,000
E	Fixed overhead cost[A-D]				13,20,000

Q.89

Flexible Sales Budget

RTP May 22



Maharatna Ltd., a public sector undertaking (PSU), produces product A. The company is in process of preparing its revenue budget for the year 2022. The company has the following information which can be useful in preparing the budget:

- (i) It has anticipated 12% growth in sales volume from the year 2021 of 4,20,000 tonnes.
- (ii) The sales price of ₹23,000 per tonne will be increased by 10% provided Wholesale Price Index (WPI) increases by 5%.
- (iii) To produce one tonne of product A, 2.3 tonnes of raw material are required. The raw material cost is ₹4,500 per tonne. The price of raw material will also increase by 10% if WPI increase by 5%.
- (iv) The projected increase in WPI for 2022 is 4%
- (v) A total of 6,000 employees works for the company. The company works 26 days in a month.
- (vi) 85% of employees of the company are permanent and getting salary as per 5- year wage agreement. The earnings per manshift (means an employee cost for a shift of 8 hours) is ₹ 3,000 (excluding terminal benefits). The new wage agreement will be implemented from 1st July 2022 and it is expected that a 15% increase in pay will be given.
- (vii) The casual employees are getting a daily wage of ₹ 850. The wages in linked to Consumer Price Index (CPI). The present CPI is 165.17 points and it is expected to be 173.59 points in year 2022.
- (viii) Power cost for the year 2021 is ₹ 42,00,000 for 7,00,000 units (1 unit = 1 Kwh). 60% of power is used for production purpose (directly related to production volume) and remaining are for employee quarters and administrative offices.
- (ix) During the year 2021, the company has paid ₹ 60,00,000 for safety and maintenance works. The amount will increase in proportion to the volume of production.
- (x) During the year 2021, the company has paid ₹ 1,20,000 for the purchase of diesel to be used in car hired for administrative purposes. The cost of diesel will increase by 15% in year 2022.
- (xi) During the year 2021, the company has paid ₹ 6,00,000 for car hire charges (excluding fuel cost). In year 2022, the company has decided to reimburse the diesel cost to the car rental company. Doing this will attract 5% GST on Reverse Charge Mechanism (RCM) basis on which the company will not get GST input credit.
- (xii) Depreciation on fixed assets for the year 2021 is ₹ 80,40,00,000 and it will be 15% lower in 2022.

Required:

From the above information PREPARE Revenue (Flexible) budget for the year 2022 and also show the budgeted profit/ loss for the year.

Ans.

Revenue Budget (Flexible Budget) of Maharatna Ltd. for the Year 2022

	Particulars	PY 2021	CY 2022
A	Sales Volume (Tonnes)	4,20,000	4,70,400 [112%×4,20,000]
B	Selling Price per tonne (₹)	23,000	23,000
		(₹ in lakh)	(₹ in lakh)
C	Sales value [A×B]	96,600	1,08,192
D	Raw material Cost:		
(i)	Qty. of Material [2.3 tonnes × A] (tonnes)	9,66,000	10,81,920
(ii)	Price per tonne (₹)	4,500	4,500
(iii)	Total raw material cost (₹ in lakh) [(i)×(ii)]	43,470	48,686.40
E	Wages & Salary Cost:		
(i)	Wages to casual employees (15% × 6,000 = 900)	2,386.80	2,508.47



	employees)	$[900 \times 26 \times 12 \times ₹ 850]$	$[900 \times 26 \times 12 \times ₹ 893.33]$
(ii)	Salary to permanent employees ($85\% \times 6,000 = 5,100$ employees)	47,736 $[5100 \times 26 \times 12 \times ₹ 3,000]$	51,316.20 $[(5100 \times 26 \times 6 \times ₹ 3,000) + (5100 \times 26 \times 6 \times ₹ 3,450)]$
(iii)	Total wages & salary [(i)+(ii)]	50,122.80	53,824.67
F	Power cost:		
(i)	For production (units)	4,20,000 $[60\% \times 7,00,000]$	4,70,400 $[112\% \times 4,20,000]$
(ii)	For employees & offices (units) $[40\% \times 7,00,000]$	2,80,000	2,80,000
(iii)	Total Power consumption (units) [(i)+(ii)]	7,00,000	7,50,400
(iv)	Power rate per unit (₹) $[₹42,00,000 \div 7,00,000]$	6.00	6.00
(v)	Total power cost [(iii)×(iv)]	42	45.024
G	Safety and maintenance Cost	60	67.20 $[112\% \times 60,00,000]$
H	Diesel cost	1.2	-
I	Car Hire charge:		
(i)	Car hire charge	6	6
(ii)	Fuel reimbursement cost	-	1.38 $[115\% \times 1.2]$
(iii)	GST@5% on RCM basis $[5\% \times (i+ii)]$	-	0.369
(iv)	Total Car hire charge cost [(i)+(ii)+(iii)]	6	7.749
J	Depreciation	8,040	6,834 $[85\% \times 8040]$
K	Total Cost [Sum of D to J]	1,01,742	1,09,465.043
L	Profit/ (Loss) [C-L]	(5,142)	(1273.043)

Q.90

Material Purchase Budget

RTP May 23



EDF Ltd. produces two products using Skilled labour and two types of materials. Shown below the information for the next month's budget:

	Product- A	Product-B
Budgeted sales (in units)	4,080	6,120
Budgeted material consumption per unit (in kg):		
Material-X	8.5	5.1
Material-Y	6.8	10.2
Standard labour hours allowed per unit of product	5.1	8.5

Material-X and Material-Y cost ₹8 and ₹10 per kg and labours are paid ₹30 per hour. Overtime premium is 75% and is payable, if a worker works for more than 45 hours a week. There are 400 direct workers.

The target efficiency ratio for the productive hours worked by the direct workers in actually manufacturing the products is 85%. In addition the non-productive down-time is budgeted at 15% of the productive hours worked.

There are four 6-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	550 units
Product-B	350 units
Material-X	1,200 kgs.
Material-Y	600 kgs.

The anticipated closing stocks for budget period are as below:

Product-A	5 days sales
Product-B	5 days sales
Material-X	10 days consumption
Material-Y	5 days consumption

CALCULATE the Material Purchase Budget and the Wages Budget for the direct workers, showing the quantities and values, for the next month.

Ans.

Number of days in budget period = 4 weeks × 6 days = 24 days

Number of units to be produced

	Product-A (units)	Product-B (units)
Budgeted Sales	4,080	6,120
Add: Closing stock	850	1275
	$\left(\frac{4080 \text{ units}}{24 \text{ days}} \times 5 \text{ days} \right)$	$\left(\frac{6120 \text{ units}}{24 \text{ days}} \times 5 \text{ days} \right)$
	550	350
Less: Opening stock	4,380	7,045
(i) Material Purchase Budget	Material-X (Kg.)	Material-Y (Kg.)
Material required:		
Product-A	37,230	29,784
	(4,380 units × 8.5 kg.)	(4,380 units × 6.8 kg.)
Product-B	35,930	71,859
	(7,045 units × 5.1 kg.)	(7,045 units × 10.2 kg.)
	73,160	
Add: Closing stock	30,483	1,01,643
	$\left(\frac{73160 \text{ kgs.}}{24 \text{ days}} \times 10 \text{ days} \right)$	21,176
		$\left(\frac{101643 \text{ kgs.}}{24 \text{ days}} \times 5 \text{ days} \right)$
Less: Opening stock Quantity to be purchased Rate per kg. of Material	1,200	
	1,02,443	600
	8	1,22,219
	8,19,541	10
Total Cost	Product-A (Hours)	12,22,186
(ii) Wages Budget	4,380	Product-B (Hours)
Units to be produced	5.1	7,045
Standard hours allowed per unit	22,338	8.5



Total Standard Hours allowed		59,883
Productive hours required for production	$\frac{22338 \text{ hours}}{85\%} \times 26280$	$\frac{59883 \text{ hours}}{85\%} \times 70450$
Add: Non-Productive down time hours	3942 (15% of 26,280 hours)	10568 (15% of 70,450 hours)
Hours to be paid	30,222	81,018
Total Hours to be paid =	1,11,240	
Hours to be paid at normal rate (4 weeks × 45 hours × 400 workers) =	72,000	
Hours to be paid at premium rate	39,240	
Total wages to be paid = (72,000 hours × ₹30 + 39,240 hours × ₹ 52.5)	= ₹ 21,60,000 + ₹ 20,60,100 = ₹ 42,20,100	

Q.91

Master budget

MTP Nov 20



'Mirror Look', a high gloss wooden manufacturing company, requires you to PREPARE the Master budget for the next year from the following information:

Sales:

Acrylic finish wooden sheets

₹ 70,00,000

Lacquer finish wooden sheets

₹ 30,00,000

Direct material cost

65% of sales

Direct wages

25 workers @ ₹ 1,500 per month

Factory overheads:

Indirect labour

Works manager

₹ 5,500 per month

Foreman

₹ 4,500 per month

Stores and spares

2.5% on sales

Depreciation on machinery

₹ 1,26,000

Light and power (fixed)

₹ 30,000

Repairs and maintenance

₹ 80,000

Others sundries

10% on direct wages

Administration, selling and distribution expenses

₹ 3,99,000 p.a.

Ans.

Master Budget for the year ending __ __

Particulars	(₹)	(₹)	(₹)
Sales:			
Acrylic finish wooden sheets			70,00,000
Lacquer finish wooden sheets			30,00,000
Total Sales			1,00,00,000
Less: Cost of production:			
Direct materials (65% of ₹ 1,00,00,000)		65,00,000	
Direct wages (25 workers × ₹ 1,500 × 12 months)		4,50,000	
Prime Cost		69,50,000	

Fixed Factory Overhead:			
Works manager's salary (5,500 × 12 months)	66,000		
Foreman's salary (4,500 × 12 months)	54,000		
Depreciation	1,26,000		
Light and power	30,000	2,76,000	
Variable Factory Overhead:			
Stores and spares (2.5% of ₹ 1,00,00,000)			
Repairs and maintenance	2,50,000		
Sundry expenses	80,000	3,75,000	
Works Cost	45,000		76,01,000
Gross Profit (Sales - Works cost)			23,99,000
Less: Adm., selling and distribution expenses			3,99,000
Net Profit			20,00,000

11

CHAPTER

SERVICE COSTING

Q.92

Hotel Ques (Room rent/day)

PY Nov 19



A hotel is being run in a Hill station with 200 single rooms. The hotel offers concessional rates during six off-season months in a year.

During this period, half of the full room rent is charged. The management's profit margin is targeted at 20% of the room rent. The following are the cost estimates and other details for the year ending 31st March, 2019:

- (i) Occupancy during the season is 80% while in the off-season it is 40%.
- (ii) Total investment in the hotel is ₹ 300 lakhs of which 80% relates to Buildings and the balance to Furniture and other Equipment.
- (iii) Room attendants are paid ₹ 15 per room per day on the basis of occupancy of rooms in a month.
- (iv) Expenses:
 - Staff salary (excluding that of room attendants) ₹ 8,00,000
 - Repairs to Buildings ₹ 3,00,000
 - Laundry Charges ₹ 1,40,000
 - Interior Charges ₹ 2,50,000
 - Miscellaneous Expenses ₹ 2,00,200
- (v) Annual Depreciation is to be provided on Buildings @ 5% and 15% on Furniture and other Equipments on straight line method.
- (vi) Monthly lighting charges are ₹ 110, except in four months in winter when it is ₹ 30 per room and this cost is on the basis of full occupancy for a month.

Ans.

Working Notes:



- (i) Total Room days in a year

Season	Occupancy (Room-days)	Equivalent Full Room charge days
Season - 80% Occupancy	200 Rooms × 80% × 6 months × 30 days in a month = 28,800 Room Days	28,800 Room Days × 100% = 28,800
Off-season - 40% Occupancy	200 Rooms × 40% × 6 months × 30 days in a month = 14,400 Room Days	14,400 Room Days × 50% = 7,200
Total Room Days	28,800 + 14,400 = 43,200 Room Days	36,000 Full Room days

- (ii) Lighting Charges:

It is given in the question that lighting charges for 8 months is ₹110 per month and during winter season of 4 months it is ₹30 per month. Further it is also given that peak season is 6 months and off season is 6 months.

It should be noted that - being Hill station, winter season is to be considered as part of Off season. Hence, the non-winter season of 8 months include - Peak season of 6 months and Off season of 2 months. Accordingly, the lighting charges are calculated as follows:

Season	Occupancy (Room-days)
--------	-----------------------

Season & Non-winter - 80% Occupancy	200 Rooms × 80% × 6 months × ₹ 110 per month = ₹ 1,05,600
Off- season & Non-winter - 40% Occupancy (8 - 6 months)	200 Rooms × 40% × 2 months × ₹110 per month = ₹ 17,600
Off- season & -winter - 40% Occupancy months)	200 Rooms × 40% × 4 months × ₹ 30 per month = ₹ 9,600
Total Lighting charges	₹ 1,05,600 + ₹ 17,600 + ₹ 9,600 = ₹ 132,800

Statement of total cost:

	(₹)
Staff salary	8,00,000
Repairs to building	3,00,000
Laundry	1,40,000
Interior	2,50,000
Miscellaneous Expenses	2,00,200
Depreciation on Building (₹ 300 Lakhs × 80% × 5%)	12,00,000
Depreciation on Furniture & Equipment (₹ 300 Lakhs × 20% × 15%)	9,00,000
Room attendant's wages (₹ 15 per Room Day for 43,200 Room Days)	6,48,000
Lighting charges	1,32,800
Total cost	45,71,000
Add: Profit Margin (20% on Room rent or 25% on Cost)	11,42,750
Total Rent to be charged	57,13,750

Calculation of Room Rent per day:

Total Rent / Equivalent Full Room days = ₹ 57,13,750 / 36,000 = ₹ 158.72

Room Rent during Season = ₹ 158.72

Room Rent during Off season = ₹ 158.72 × 50% = ₹ 79.36

Q.93

Hospital Ques + BED

PY Jan 21



ABC Health care runs an Intensive Medical Care Unit. For this purpose, it has hired a building at a rent of ₹ 50,000 per month with the agreement to bear the repairs and maintenance charges also.

The unit consists of 100 beds and 5 more beds can comfortably be accommodated when the situation demands. Though the unit is open for patients all the 365 days in a year, scrutiny of accounts for the year 2020 reveals that only for 120 days in the year, the unit had the full capacity of 100 patients per day and for another 80 days, it had, on an average only 40 beds occupied per day. But, there were occasions when the beds were full, extra beds were hired at a charge of ₹ 50 per bed per day. This did not come to more than 5 beds above the normal capacity on any one day. The total hire charges for the extra beds incurred for the whole year amounted to ₹ 20,000.

The unit engaged expert doctors from outside to attend on the patients and the fees were paid on the basis of the number of patients attended and time spent by them which on an average worked out to ₹ 30,000 per month in the year 2020.

The permanent staff expenses and other expenses of the unit were as follows:



	₹
2 Supervisors each at a per month salary of	5,000
4 Nurses each at a per month salary of	3,000
2 Ward boys each at a per month salary of	1,500
Other Expenses for the year were as under:	
Repairs and Maintenance	28,000
Food supplied to patients	4,40,000
Caretaker and Other services for patients	1,25,000
Laundry charges for bed linen	1,40,000
Medicines supplied	2,80,000
Cost of Oxygen etc. other than directly borne for treatment of patients	75,000
General Administration Charges allocated to the unit	71,000

Required:

- What is the profit per patient day made by the unit in the year 2020, if the unit recovered an overall amount of ₹ 200 per day on an average from each patient.
- The unit wants to work on a budget for the year 2021, but the number of patients requiring medical care is a very uncertain factor. Assuming that same revenue and expenses prevail in the year 2021 in the first instance, work out the number of patient days required by the unit to break even.

Ans.

Workings:

Calculation of number of Patient days

100 Beds × 120 days = 12000

40 Beds × 80 days = 3,200

Extra beds = 400

Total = 15,600

- Statement of Profitability

Particulars	Amount (₹)	Amount (₹)
Income for the year (₹ 200 per patient per day × 15,600 patient days)		31,20,000
Variable Costs:		
Doctor Fees (₹ 30,000 per month × 12)	3,60,000	
Food to Patients (Variable)	4,40,000	
Caretaker Other services to patients (Variable)	1,25,000	
Laundry charges (Variable)	1,40,000	
Medicines (Variable)	2,80,000	
Bed Hire Charges (₹ 50 × 400 Beds)	20,000	
Total Variable costs		(13,65,000)

Contribution		17,55,000
Fixed Costs:		
Rent (₹ 50,000 per month × 12)	6,00,000	
Supervisor (2 persons × ₹ 5,000 × 12)	1,20,000	
Nurses (4 persons × ₹ 3,000 × 12)	1,44,000	
Ward Boys (2 persons × ₹ 1500 × 12)	36,000	
Repairs (Fixed)	28,000	
Cost of Oxygen	75,000	
Administration expenses allocated	71,000	
Total Fixed Costs		(10,74,000)
Profit		6,81,000

Calculation of Contribution and profit per Patient day

Total Contribution = 17,55,000

Total Patient days = 15,600 days

Contribution per Patient day = 17,55,000 / 15,600 days = 112.50

Total Profit = 6,81,000

Total Patient days = 15,600 days

Profit per Patient day = 6,81,000 / 15,600 days = 43.65

- (ii) Breakeven Point = Fixed Cost / Contribution per Patient day
 = ₹ 10,74,000 / ₹ 112.50
 = 9,547 patient days

Q.94

Passenger (Bus) Ques

PY Dec 21



Paras Travels provides mini buses to an IT company for carrying its employees from home to office and dropping back after office hours. It runs a fleet of 8 mini buses for this purpose. The buses are parked in a garage adjoining the company's premises. Company is operating in two shifts (one shift in the morning and one shift in the afternoon). The distance travelled by each mini bus one way is 30 kms. The company works for 20 days in a month. The seating capacity of each mini bus is 30 persons. The seating capacity is normally 80% occupied during the year. The details of expenses incurred for a year are as under:

Particulars	
Driver's salary	₹ 20,000 per driver per month
Lady attendant's salary (mandatorily required for each mini bus)	₹ 10,000 per attendant per month
Cleaner's salary (One cleaner for 2 mini buses)	₹ 15,000 per cleaner per month
Diesel (Avg. 8 kms per litre)	₹ 80 per litre
Insurance charges (per annum)	2% of Purchase Price
License fees and taxes	₹ 5,080 per mini bus per month
Garage rent paid	₹ 24,000 per month
Repair & maintenance including engine oil and lubricants (for every 5,760 kms)	₹ 2,856 per mini bus
Purchase Price of mini bus	₹ 15,00,000 each
Residual life of mini bus	8 Years
Scrap value per mini bus at the end of residual life	₹ 3,00,000

Paras Travels charges two types of fare from the employees. Employees coming from a distance of beyond 15 kms away from the office are charged double the fare which is charged from employees coming from a distance of up-to 15 kms. away from the office. 50% of employees travelling in each trip are coming from a distance beyond 15 kms. from the office. The charges are to be based on average cost.

You are required to:

- (i) Prepare a statement showing expenses of operating a single mini bus for a year,
- (ii) Calculate the average cost per employee per month in respect of:
 - (a) Employees coming from a distance upto 15 kms. from the office.
 - (b) Employees coming from a distance beyond 15 kms. from the office.

Ans.

- (i) **Statement of Expenses of operating a mini bus in a year**

Particulars	Rate (₹)	Per Bus per annum (₹)
(A) Standing Charges:		
Driver's salary	20,000 p.m	2,40,000
Lady attendant's salary	10,000 p.m	1,20,000
Average Cleaner's salary (50%)	15,000 p.m	90,000
Insurance charge	30,000 p.a.	30,000
License fee, taxes etc.	5,080 p.m.	60,960
Average Garage Rent	24,000 p.m	36,000
Depreciation {(15,00,000 - 3,00,000) ÷ 8}	1,50,000 p.a.	1,50,000
(B) Maintenance Charges:		
Repairs & maintenance including engine oil and lubricants (Working Note 1)	28,560 p.a.	
(C) Operating Charges:		
Diesel (Working Note 2)		5,76,000
Total Cost (A + B + C)		13,31,520
Cost per month		1,10,960

- (ii) **Average cost per employee per month:**

- (a) **Employee coming from distance of upto 15 km**

$$= \frac{\text{Total cost per month}}{\text{Total no of equivalent employee}} = \frac{1,10,960}{72^*} = 1,541.11$$

- (b) **Employee coming from a distance beyond 15 km**

$$= 1541.11 \times 2 = ₹ 3,082.2$$

* Considering half fare employees as a base

Full fare employees (12 × 2)

Add: Half fare employees (Working Note 3)

Total Equivalent number of employees per month

Total Equivalent number of employees per month (morning + afternoon shift of company)

Working Notes:

1. **Calculation of Repairs and maintenance cost of a bus :**

Distance travelled in a year:

(4 trip × 2 shifts × 30 km. × 20 days × 12 months) Distance travelled p.a.: 57,600 km.

Repairs and maintenance cost per Bus per annum:

2. **Calculation of diesel cost per bus per annum: Distance travelled in a year = 57,600 km**

Diesel cost per Bus per annum:

57,600 km.

3. **Calculation of equivalent number of employees per bus:**

Seating capacity of a bus	30 employees
Occupancy (80% of capacity)	24 employees
Half fare employees (50% of 24 employees)	12 employees
Full fare employees (50% of 24 employees)	12 employee

[Note: Total Equivalent number of employees per month (morning + afternoon shift of company can also be calculated considering full fare employees as a base. In that case the number will be 36. Then fare for employees coming from distance beyond 15km will be

$$\frac{1,10,960}{36} = 3,082.22 \text{ and employees coming from distance upto 15 km will be}$$

$$3,082.22 / 2 = ₹ 1,541.11]$$

Q.95

Lorry running Ques/rail run

PY May 22

first attempt success tutorials

Coal is transported from two mines X & Y and unloaded at plots in a railway station. X is at distance of 15 kms and Y is at a distance of 20 kms from the rail head plots. A fleet of lorries having carrying capacity of 4 tonnes is used to transport coal from the mines. Records reveal that average speed of the lorries is 40 kms per hour when running and regularly take 15 minutes to unload at the rail head.

At Mine X average loading time is 30 minutes per load, while at mine Y average loading time is 25 minutes per load.

Additional Information:

Drivers' wages, depreciation, insurance and taxes, etc. ₹ 12 per hour Operated Fuel, oil tyres, repairs and maintenance, etc. ₹ 1.60 per km

You are required to prepare a statement showing the cost per tonne kilometre of carrying coal from each mine 'X' and 'Y'.

Ans.

Statement showing the cost per tonne-kilometre of carrying mineral from each mine

	Mine X (₹)	Mine Y (₹)
Fixed cost per trip: (Refer to working note 1)		
(Driver's wages, depreciation, insurance and taxes)		
X: 1 hour 30 minutes @ ₹ 12 per hour	18.00	
Y: 1 hour 40 minutes @ ₹ 12 per hour		20.00
Running and maintenance cost:		
(Fuel, oil, tyres, repairs and maintenance)		



X: 30 km. ₹ 1.60 per km.	48.00	
Y: 40 km. ₹ 1.60 per km.		64.00
Total cost per trip (₹)	66.00	84.00
Cost per tonne - km (Refer to working note 2)	1.1 $\left(\frac{66}{60 \text{ tonne} - \text{km}} \right)$	1.05 $\left(\frac{84}{80 \text{ tonne} - \text{km}} \right)$

Working notes:

	Mine- X	Mine- Y
(1) Total operated time taken per trip		
Running time to & fro	45 minutes $\left(30 \text{ km.} \times \frac{60 \text{ minutes}}{40 \text{ km.}} \right)$	60 minutes $\left(40 \text{ km.} \times \frac{60 \text{ minutes}}{40 \text{ km.}} \right)$
Un-loading time	15 minutes	15 minutes
Loading time	30 minutes	25 minutes
Total operated time	90 minutes or 1 hour 30 minutes	100 minutes or 1 hour 40 minutes
(2) Effective tones - km.	60 (4 tonnes × 15 km.)	80 (4 tonnes × 20 km.)

Q.96

Toll Plaza Ques

PY May 23



RST Toll Plaza Limited built an 80-kilometre-long highway between two cities and operates a toll plaza to collect tolls from passing vehicles using the highway. The company has estimated that 50,000 light weight, 12,000 medium weight and 10,000 heavy weight vehicles will be using the highway in one month in outward journey and the same number for return journey.

As per government notification, vehicles used for medical emergencies, Members of Parliament, and essential services are exempt from toll charges. It is estimated that 10% of light weight vehicles will pass the highway for such use.

It is the policy of the company that if vehicles return within 24 hours of their outward journey, the toll fare will be reduced by 25 percent automatically. It is estimated that 30% of chargeable light weight vehicles return within the specified time frame.

The toll charges for medium weight vehicles is to be fixed as 2.5 times of the light weight vehicles and that of heavy weight vehicles as 2 times of the medium weight vehicles.

The toll and maintenance cost for a month is ₹ 59,09,090, The company requires a profit of 10% over the total cost to cover interest and other costs.

Required:

- Calculate the toll rate for each type of vehicle if concession facilities are not available on the return journey.
- Calculate the toll rate that will be charged from light weight vehicles if a return journey concession facility is available, assuming that the revenue earned from light weight vehicles calculated in option (i) remains the same.

Ans.**Working Notes:**

- (1) Calculation of equivalent numbers of Light weight vehicles (when no concession is provided on return journey)

Type of vehicle	Monthly traffic (A)	Return traffic (B)	Ratio (C)	Equivalent light weight [(A + B) × C]
Light weight	45,000*	45,000	1	90,000
Medium weight	12,000	12,000	2.5	60,000
Heavy weight	10,000	10,000	5	<u>1,00,000</u>
				2,50,000

*50,000 light vehicles less 10% exempted vehicles

- (2) Calculation of equivalent numbers of Light weight vehicles (when concession is provided on return journey)

Type of vehicle	Monthly traffic (A)	Return traffic (B)	Ratio (C)	Equivalent light weight [(A + B) × C]
Light weight	45,000*	41,625 [45,000 - (45,000 × 30% × 25%)]	1	86,625
Medium weight	12,000	12,000	2.5	60,000
Heavy weight	10,000	10,000	5	<u>1,00,000</u>
				2,46,625

- (i) Calculation of toll rate for each type of vehicle:

Total cost to cover ÷ Equivalent type of vehicles

(₹ 59,09,090 + 10% of ₹ 59,09,090) ÷ 2,50,000 equivalent vehicles (Refer working note 1)

= 65,00,000 ÷ 2,50,000 = ₹ 26

Toll rate for:

Light weight vehicle = ₹ 26

Medium weight vehicle = ₹ 26 × 2.5 = ₹ 65 Heavy weight vehicle = ₹ 26 × 5 = ₹ 130

- (ii) Calculation of toll rate for each type of vehicle:

Revenue earned from Light weight vehicle in (i) above

= 90,000 vehicles × ₹ 26 = ₹ 23,40,000

New toll rate to maintain the same revenue from Light weight vehicle

= ₹ 23,40,000 ÷ 86,625 (Refer working note-2) = ₹ 27.01 Light weight vehicle = ₹ 27.01

Rate to be charged from 13,500 light weight vehicles = 27.01 × 0.75 = 20.26

Alternative presentation

- (ii) Toll rate to be charged from light weight vehicles if concession applicable

Revenue share in light vehicles = 90,000 × 26 = ₹ 23,40,000

Suppose rate is x, then outward journey 45,000 x; return journey (45,000 - 30% of 45,000) + 13,500 (x - 0.25)

$$45,000x + 31,500x + 13,500 (0.75x) = ₹ 23,40,000$$

Toll rate to be charged from light weight vehicles : 86,625x = ₹ 23,40,000 =

₹ 27.01

Rate to be charged from 76,500 light weight vehicles @ 27.01; revenue will be

₹ 20,66,494

Rate to be charged from 13,500 light weight vehicles = 27.01 × 0.75 = 20.26 revenue will be ₹ 2,73,506

Q.97

Insurance Co.

RTP Nov 18



Sanziet Lifecare Ltd. operates in life insurance business. Last year it has launched a new term insurance policy for practicing professionals 'Professionals Protection Plus'. The company has incurred the following expenditures during the last year for the policy:

Policy development cost	₹11,25,000
Cost of marketing of the policy	₹45,20,000
Sales support expenses	₹11,45,000
Policy issuance cost	₹10,05,900
Policy servicing cost	₹35,20,700
Claims management cost	₹1,25,600
IT cost	₹74,32,000
Postage and logistics	₹10,25,000
Facilities cost	₹15,24,000
Employees cost	₹ 5,60,000
Office administration cost	₹16,20,400

Number of policy sold- 528

Total insured value of policies- ₹1,320 crore

Required:

- CALCULATE total cost for Professionals Protection Plus' policy segregating the costs into four main activities namely (a) Marketing and Sales support, (b) Operations, (c) IT and (d) Support functions.
- CALCULATE cost per policy.
- CALCULATE cost per rupee of insured value.

Ans.

(i) Calculation of total cost for 'Professionals Protect Plus' policy

	Particulars	Amount (₹)	Amount (₹)
1.	Marketing and Sales support:		
	- Policy development cost	11,25,000	
	- Cost of marketing	45,20,000	
	- Sales support expenses	11,45,000	67,90,000
2.	Operations:		
	- Policy issuance cost	10,05,900	
	- Policy servicing cost	35,20,700	
	- Claims management cost	1,25,600	46,52,200
3.	IT Cost		74,32,000
4.	Support functions		

- Postage and logistics	10,25,000	
- Facilities cost	15,24,000	
- Employees cost	5,60,000	47,29,400
- Office administration cost	16,20,400	
Total Cost		2,36,03,600

(ii) **Calculation of cost per policy** = $\frac{\text{Total cost}}{\text{No of policies}} = \frac{2,36,03,600}{528} = 44,703.79$

(iii) **Cost per rupee of insured value** = $\frac{\text{Total cost}}{\text{Total insured value}} = \frac{2.36\text{crore}}{1,320\text{crore}} = 0.0018$

Q.98

Lorry/ Truck Ques

RTP Nov 19



A transport company has a fleet of four trucks of 10 tonne capacity each plying in different directions for transport of customer's goods. The trucks run loaded with goods and return empty. The distance travelled, number of trips made and the load carried per day by each truck are as under:

Truck No.	One way Distance Km	No. of trips per day	Load carried per trip / day tonnes
1	48	4	6
2	120	1	9
3	90	2	8
4	60	4	8

The analysis of maintenance cost and the total distance travelled during the last two years is as under

Year	Total distance travelled	Maintenance Cost ₹
1	1,60,200	1,38,150
2	1,56,700	1,35,525

The following are the details of expenses for the year under review:

Diesel	₹ 60 per litre. Each litre gives 4 km per litre of diesel on an average.
Driver's salary	₹ 22,000 per truck per month
Licence and taxes	₹ 15,000 per annum per truck
Insurance	₹ 80,000 per annum for all the four trucks
Purchase Price per truck	₹30,00,000, Life 10 years. Scrap value at the end of life is ₹1,00,000.
Oil and sundries	₹ 525 per 100 km run.
General Overhead	₹ 1,10,840 per annum

The trucks operate 24 days per month on an average.

Required

- PREPARE an Annual Cost Statement covering the fleet of four trucks.
- CALCULATE the cost per km. run.
- DETERMINE the freight rate per tonne km. to yield a profit of 30% on freight.

Ans.

(i) **Annual Cost Statement of four vehicles**

	(₹)
--	-----



Diesel {(4,21,632 km. ÷ 4 km) × ₹ 60} (Refer to Working Note 1)	63,24,480
Oil & sundries {(4,21,632 km. ÷ 100 km.) × ₹ 525}	22,13,568
Maintenance {(4,21,632 km. × ₹ 0.75) + ₹ 18,000} (Refer to Working Note 2)	3,34,224
Drivers' salary {(₹22,000 × 12 months) × 4 trucks}	10,56,000
Licence and taxes (₹ 15,000 × 4 trucks)	60,000
Insurance	80,000
Depreciation {(₹29,00,000 ÷ 10 years) × 4 trucks}	11,60,000
General overhead	1,10,840
Total annual cost	1,13,39,112

(ii) Cost per km. run

$$\begin{aligned}\text{Cost per kilometer run} &= \frac{\text{Total annual cost of vehicles}}{\text{Total kilometre travelled annually}} \quad (\text{Refer to Working Note 1}) \\ &= \frac{1,13,39,112}{4,21,632 \text{ kms}} = 26.89\end{aligned}$$

(iii) Freight rate per tonne km (to yield a profit of 30% on freight)

$$\begin{aligned}\text{Cost per tonne km} &= \frac{\text{Total annual cost of three vehicles}}{\text{Total effectiveness tonnes kms per annum}} = (\text{Refer to Working Note 1}) \\ &= \frac{1,13,39,112}{16,10,496 \text{ kms}} = 7.04 \\ \text{Freight rate per tonne km.} &= \frac{7.04}{0.7} \times 1 = 10.06\end{aligned}$$

Working Notes:

1. Total kilometre travelled and tonnes kilometre (load carried) by four trucks in one year

Truck number	One way distance in kms	No. of trips	Total distance covered in km per day	Load carried per trip/day in tonnes	Total effective tonnes km
1	48	4	384	6	1,152
2	120	1	240	9	1,080
3	90	2	360	8	1,440
4	60	4	480	8	1,920
Total			1,464		5,592

Total kilometre travelled by four trucks in one year

$$(1,464 \text{ km.} \times 24 \text{ days} \times 12 \text{ months}) = 4,21,632$$

Total effective tonnes kilometre of load carried by four trucks during one year

$$(5,592 \text{ tonnes km.} \times 24 \text{ days} \times 12 \text{ months}) = 16,10,496$$

2. Fixed and variable component of maintenance cost:

$$\text{Variable maintenance cost per km} = \frac{\text{Difference in maintenance cost}}{\text{Difference in distance travelled}}$$

$$= \frac{1,38,150 - 1,35,525}{1,60,200 \text{ kms} - 1,56,700 \text{ kms}}$$

$$= 0.75$$

Fixed maintenance cost = Total maintenance cost - Variable maintenance cost

$$= 1,38,150 - 1,60,200 \text{ kms} \times 0.75 = 18,000$$

Q.99

Airline/ Passenger Ques

MTP Nov 18(2)



DKG Airlines owns single passenger aircraft and operates between Melbourne and Delhi only. Flight leaves Melbourne on Monday and Thursday and departs from Delhi on Wednesday and Saturday. DKG Airlines cannot afford any more flight between Melbourne and Delhi. Only economical class seats are available on its flight and all tickets are booked by travel agents. The following information are collected.

Seating capacity per plane	360
Average passengers per flight	250
Flights per week	4
Flights per year	208
Average one-way fare	Rs.50,000
Variable fuel cost	Rs.28,00,000 per flight
Food service to passengers (not charged to Passengers)	Rs.2,600 per passenger
Commission to travel agents	15% of fare
Fixed annual lease cost allocated to each flight	Rs. 15,30,000 per flight
Fixed ground services (maintenance, check in, Baggage handling cost) allocated to each flight	Rs.1,70,000 per flight
Fixed salaries of flight crew allocated to each flight	Rs.6,50,000 per flight

For the sake of simplicity assume that fuel cost is unaffected by the actual number of passengers on a flight.
Required:

- CALCULATE the operating income that DKG Airlines makes on each way flight between Melbourne and Delhi?
- The market research department of DKG Airlines indicates that lowering the average one-way fare to Rs. 48,000 and increase in agents' commission to 17.5% will increase the average number of passenger per flight to 275. DECIDE whether DKG Airlines should lower its fare or not?

Ans

- Statement of operating income of DKG Airlines for Melbourne-Delhi flight (one way)**

Particulars	Amount (Rs.)	Amount (Rs.)
Fare received (per flight): 250 passengers × Rs. 50,000		1,25,00,000
Variable costs (per flight):		
- Fuel cost	28,00,000	
- Food (250 × Rs. 2,600)	6,50,000	
- Commission to Travel Agents (15% of Rs. 1,25,00,000)	18,75,000	(53,25,000)
Contribution per flight		71,75,000
Fixed cost (per flight):		
Annual lease cost	15,30,000	

Fixed ground service costs	1,70,000	
Salaries of flight crew	6,50,000	(23,50,000)
Operating income per flight		48,25,000

(ii) **Operating income of DKG Airlines per Melbourne-Delhi flight (one way) after reduction in fare**

Fare received (per flight): 275 passengers × Rs. 48,000		1,32,00,000
Variable costs (per flight):		
Fuel cost	28,00,000	
Food (275 × Rs.2,600)	7,15,000	
Commission to Travel Agents (17.5% of Rs.1,32,00,000)	23,10,000	(58,25,000)
Contribution per flight		73,75,000

Excess contribution due to lowering of fare (Rs.73,75,000 - Rs.71,75,000) = Rs.2,00,000. DKG Airlines should lower its fare as it would increase its contribution by Rs. 2,00,000

Q.100

Lorry Ques

MTP May 21



GMCS Ltd. collects raw milk from the farmers of Ramgarh, Pratapgarh and Devgarh panchayats and processes this milk to make various dairy products. GMCS Ltd. has its own vehicles (tankers) to collect and bring the milk to the processing plant. Vehicles are parked in the GMCS Ltd.'s garage situated within the plant compound.

Following are the information related with the vehicles:

	Ramgarh	Pratapgarh	Davgarh
No. of vehicles assigned	4	3	5
No. of trips a day	3	2	4
One way distance from the processing plant	24 k.m.	34 k.m.	16 k.m.
Fess & taxes per month (Rs.)	5,600	6,400	---

All the 5 vehicles assigned to Devgarh panchayat, were purchased five years back at a cost of Rs. 9,25,000 each. The 4 vehicles assigned to Ramgarh panchayat, were purchased two years back at a cost of Rs. 11,02,000 each and the remaining vehicles assigned to Pratapgarh were purchased last year at a cost of Rs. 13,12,000 each. With the purchase of each vehicle a two years free servicing warranty is provided. A vehicle gives 10 kmpl mileage in the first two year of purchase, 8 kmpl in next two years and 6 kmpl afterwards. The vehicles are subject to depreciation of 10% p.a. on straight line basis irrespective of usage. A vehicle has the capacity to carry 10,000 litres of milk but on an average only 70% of the total capacity is utilized.

The following expenditures are related with the vehicles:

Salary of Driver (a driver for each vehicle)	Rs. 24,000 p.m.
Salary to Cleaner (a cleaner for each vehicle)	Rs. 12,000 p.m.
Allocated garage parking fee	Rs. 4,200 per vehicle per month
Servicing cost	Rs. 15,000 for every complete 5,000 k.m. run.
Price of diesel per litre	Rs. 78.00

From the above information you are required to CALCULATE

- (i) Total operating cost per month for each vehicle. (Take 30 days for the month)
- (ii) Vehicle operating cost per litre of milk.

Ans.

- (i) **Calculation of Operating Cost per month for each vehicle**

	Ramgarh (Rs.)	Pratapgarh (Rs.)	Devgarh (Rs.)	Total (Rs.)
A. Running Costs:				
- Cost of diesel (Working Note- 2)	1,68,480	95,472	2,49,600	5,13,552
- Servicing cost (Working Note- 3)	45,000	-	45,000	90,000
	2,13,480	95,472	2,94,600	6,03,552
B. Fixed Costs:				
- Salary to drivers (4 drivers × Rs. 24,000)	96,000	72,000 (3 drivers × Rs. 24,000)	1,20,000 (5 drivers × Rs. 24,000)	2,88,000
- Salary to cleaners (4 cleaners × Rs. 12,000)	48,000	36,000 (3 cleaners × Rs. 12,000)	60,000 (5 cleaners × Rs. 12,000)	1,44,000
- Allocated garage parking fee (4 vehicles × Rs. 4,200)	16,800	12,600 (3 vehicles × Rs. 4,200)	21,000 (5 vehicles × Rs. 4,200)	50,400
- Depreciation (Working Note- 4)	36,733	32,800	38,542	
- Fess & taxes	5,600	6,400	---	1,08,075
	2,03,133	1,59,800	2,39,542	12,000
	4,16,613	2,55,272	5,34,142	6,02,475
Total [A + B]	1,04,153	85,091	1,06,828	12,06,027
Operating Cost per vehicle	(Rs. 4,16,613 ÷ 4 vehicles)	(Rs. 2,55,272 ÷ 3 vehicles)	(Rs. 5,34,142 ÷ 5 vehicles)	(Rs. 12,06,027 ÷ 12 vehicles)

- (ii) **Vehicle operating cost per litre of milk**

$$\frac{\text{Total Operating Cost per month}}{\text{Total milk carried a month}} = \frac{12,06,027}{79,80,000 \text{ Litres (working Note-5)}} = 0.15$$

Working Notes:

1. Distance covered by the vehicles in a month



Route	Total Distance (in K.M.)
Ramgarh (4 vehicles × 3 trips × 2 × 24 km. × 30 days)	17,280
Pratapgarh (3 vehicles × 2 trips × 2 × 34 km. × 30 days)	12,240
Devgarh (5 vehicles × 4 trips × 2 × 16 km. × 30 days)	19,200

2. Cost of diesel consumption

	Ramgarh	Pratapgarh	Devgarh
Total distance travelled (K.M.)	17,280	12,240	19,200
Mileage per litre of diesel	8 kmpl	10 kmpl	6 kmpl
Diesel consumption (Litre)	2,160	1,224	3,200
	(17,2	(12,2	(19,200 ÷
Cost of diesel consumption @	1,68,4	95,47	2,49,600
Rs. 78 per litre (Rs.)			

3. Servicing Cost

	Ramgarh	Pratapgarh	Devgarh
Total distance travelled (K.M.)	17,280	12,240	19,200
Covered under free service warranty	No	Yes	No
No. of services required	3 (17,280 k.m. ÷ 5,000 k.m.)	2 (12,240 k.m. ÷ 5,000 k.m.)	3 (19,200 k.m. ÷ 5,000 k.m.)
Total Service Cost (Rs.)	45,000 (Rs. 15,000 × 3)	---	45,000 (Rs. 15,000 × 3)

4. Calculation of Depreciation

	Ramgarh	Pratapgarh	Devgarh
No. of vehicles	4	3	5
Cost of a vehicle (Rs.)	11,02,000	13,12,000	9,25,000
Total Cost of vehicles	44,08,000	39,36,000	46,25,000
Depreciation Month(Rs.)	36,733 ($\frac{44,08,000 \times 10\%}{12 \text{ months}}$)	32,800 ($\frac{39,36,000 \times 10\%}{12 \text{ months}}$)	38,542 ($\frac{46,25,000 \times 10\%}{12 \text{ months}}$)

Q.101

Compare 3 Different Situation

MTP Nov 22(1)



A company has the following three alternative proposals for conveyance facilities for its sales personnel who has to do substantial traveling, approximately 20,000 kilometers yearly:

- (i) Purchasing and maintaining its own fleet of cars. The average cost of a car is ₹ 7,20,000

- (ii) Allow the Executive to use their own car and reimburse the expenses @ ₹ 12 per kilometer and also bear insurance costs.
- (iii) Hire cars from an agency at ₹ 2,16,000 per year per car. The company will have to bear costs of petrol, taxes and tyres.

The following further details are available:

Petrol	₹ 7.20 per km.
Tyre	₹ 0.144 per km.
Taxes	₹ 960 per car per annum
Repairs and maintenance	₹ 0.24 per km.
Insurance	₹ 1,440 per car per annum
Life of the car	5 years with annual mileage of 20,000 km.
Resale value	₹ 96,000 at the end of the fifth year.

WORK OUT the relative costs of three proposals and rank them.

Ans. Calculation of relative costs of three proposals and their ranking

	I- Use of company's car per km.(₹)	II- Use of own car	III- Use of hired car
Reimbursement	--	12.00	--
Hire Charges	--	--	10.80*
Fixed cost:			
Insurance	0.072	0.072	--
Taxes	0.048	--	0.048
Depreciation	6.24	--	--
Running and Maintenance Cost:			
Petrol	7.20	--	7.20
Repairs and Maintenance	0.24	--	--
Tyre	0.144	--	0.144
Total cost per km.	13.944	12.072	18.192
Cost for 20,000 km.	2,78,880	2,41,440	3,63,840
Ranking of proposals	II	I	III

(₹ 2,16,000 ÷ 20,000 km.) = ₹ 10.80

[(₹ 7,20,000 - ₹ 96,000) ÷ 5 years] ÷ 20,000 km. = ₹ 6.24

The Second alternative i.e., use of own car by the executive and reimbursement of expenses by the company is the best alternative from company's point of view.

Q.102

Cab Passenger Ques

MTP May 23(2)



Arnav LMV Pvt. Ltd, operates cab/ car rental service in Delhi/NCR. It provide s its service to the offices of Noida, Gurugram and Faridabad. At present it operates CNG fueled cars but it is also considering to upgrade these into Electric vehicle (EV). The following details related with the owning of CNG & EV propelled cars are as tabulated below:



Particulars	CNG Car	EV Car
Car purchase price (₹)	9,20,000	15,20,000
Govt. subsidy on purchase of car (₹)	--	1,50,000
Life of the car	15 years	10 years
Residual value (₹)	95,000	1,70,000
Mileage	20 km/kg	240 km per charge
Electricity consumption per full charge	--	30 Kwh
CNG cost per Kg (₹)	90	--
Power cost per Kwh (₹)	--	7.60
Annual Maintenance cost (₹)	8,000	5,200
Annual insurance cost (₹)	7,600	14,600
Tyre replacement cost in every 5 -year (₹)	16,000	16,000
Battery replacement cost in every 8- year (₹)	12,000	5,40,000

Apart from the above, the following are the additional information:

Particulars	
Average distance covered by a car in a month	1,500 km
Driver's salary (₹)	20,000 p.m
Garage rent per car (₹)	4,500 p.m
Share of Office & Administration cost per car (₹)	1,500 p.m

Required:

- (i) CALCULATE the operating cost of vehicle per month per car for both CNG & EV options.

Ans.

1. Calculation of Depreciation per month:

	Particulars	CNG Car	EV Car
A	Car purchase price (₹) Less:	9,20,000	15,20,000
B	Govt. subsidy (₹) Less:	--	(1,50,000)
C	Residual value (₹)	(95,000)	(1,70,000)
D	Depreciable value of car (₹) [A-B-C]	8,25,000	12,00,000
E	Life of the car	15 years	10 years
F	Annual depreciation (₹) [D÷E]	55,000	1,20,000
G	Depreciation per month (₹) [F÷12]	4,583.33	10,000

2. Fuel/ Electricity consumption cost per month:

	Particulars	CNG Car	EV Car
A	Average distance covered in a month (KM)	1,500	1,500
B	Mileage (KM)	20	240
C	Qty. of CNG/ Full charge required [A÷B]	75 kg.	6.25
D	Electricity Consumption [C×30kwh]	-	187.5
E	Cost of CNG per kg (₹)	90	-
F	Power cost per Kwh (₹)	-	7.60
G	CNG Cost per month (₹) [C×E]	6,750	-
H	Power cost per month (₹) [D×F]	-	1,425

3. Amortised cost of Tyre replacement:

	Particulars	CNG Car	EV Car
A	Life of vehicle	15 years	10 years
B	Replacement interval	5 years	5 years
C	No. of time replacement required	2 times	1 time
D	Cost of tyres for each replacement (₹)	16,000	16,000
E	Total replacement cost (₹) [C×D]	32,000	16,000
F	Amortised cost per year (₹) [E÷A]	2,133.33	1,600
E	Cost per month (₹) [F÷12]	177.78	133.33

4. Amortised cost of Battery replacement:

	Particulars	CNG Car	EV Car
A	Life of vehicle	15 years	10 years
B	Replacement interval	8 years	8 years
C	No. of time replacement required	1 time	1 time
D	Cost of battery for each replacement	12,000	5,40,000
E	(₹) Total replacement cost (₹) [C×D]	12,000	5,40,000
F	Amortised cost per year (₹) [E÷A]	800	54,000
E	Cost per month (₹) [F÷12]	66.67	4,500

Calculation of Operating cost per month:

	Particulars	CNG Car (₹)	EV Car (₹)
A	Running cost:		
	Fuel cost/ Power consumption cost [Refer WN-2]	6,750	1,425
B	Maintenance cost:		
	Annual Maintenance cost [Annual cost ÷12]	666.67	433.33
	Annual Insurance cost [Annual cost ÷12]	633.33	1,216.67
	Amortised cost of Tyre replacement [Refer WN-3]	177.78	133.33
	Amortised cost of Battery replacement [Refer WN-4]	66.67	4,500



		1,544.45	6,283.33
C	Fixed cost:		
	Depreciation [Refer WN-1]	4,583.33	10,000
	Driver's salary	20,000	20,000
	Garage rent	4,500	4,500
	Share of Office & Administration cost	1,500	1,500
		30,583.33	36,000
D	Operating cost per month [A+B+C]	38,877.7	43,708.3



12

 CHAPTER

Cost Accounting System

Q.103

Memo Reconciliation Account

PY May 19



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.

Ans.

Memorandum Reconciliation Account

Dr.		Cr.	
Particulars	(₹)	Particulars	(₹)
To Works overheads under recovered in Cost Accounts	48,600	By Net profit as per Costing books	48,408
To Provision for doubtful debts	17,800	By Office overheads over recovered in cost accounts	11,500
To Obsolescence loss	17,200	By Dividend received on shares	17,475
To Store adjustment (Debit)	35,433	By Interest on fixed deposit	21,650
		By Depreciation over- charged	5,000
		By Net loss as per financial accounts	15,000
	1,19,033		1,19,033

[Note: This question may also be solved by taking net loss as per financial accounts as basis.]

Q.104

Reconciliation Statement

RTP Nov 19



The financial books of a company reveal the following data for the year ended 31 st March, 20X8:

Opening Stock:	(₹)
Finished goods 625 units	53,125
Work-in-process	46,000
01.04.20X7 to 31.03.20X8	
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 a statements for the year ended 31st March, 20X8. Show
 - the profit as per financial records
 - the profit as per costing records.
- (iii) PREPARE a statement reconciling the profit as per costing records with the profit as per Financial Records.

Ans. (i) Statement of Profit as per Financial records (for the year ended March 31, 20X8)

	(₹)		(₹)
To Opening stock of Finished Goods	53,125	By Sales	22,80,000
To Work-in-process	46,000	By Closing stock of finished Goods	45,650
To Raw materials consumed	8,40,000	By Work-in-Process	41,200
To Direct labour	6,10,000	By Rent received	46,000
To Factory overheads	4,22,000	By Interest received	38,000
To Administration overheads	1,98,000		
To Selling & distribution overheads	72,000		
To Dividend paid	1,22,000		
To Bad debts	18,000		
To Profit	69,725		
	24,50,850		24,50,850

**Statement of Profit as per Costing records
(for the year ended March 31, 20X8)**

	(₹)
Sales revenue (A)(12,615 units)	22,80,000

Cost of sales:	
Opening stock (625 units × ₹ 120)	75,000
Add: Cost of production of 12,405 units (Refer to working note 2)	21,63,350
Less: Closing stock (₹174.39 × 415 units)	(72,372)
Cost of goods sold (12,615 units)	21,65,978
Selling & distribution overheads (12,615 units × ₹ 3)	37,845
Cost of sales: (B)	22,03,823
Profit: {(A) - (B)}	76,177

(ii) **Statement of Reconciliation**
 (Reconciling the profit as per costing records with the profit as per financial records)

	(₹)	(₹)
Profit as per Cost Accounts		76,177
Add: Administration overheads over absorbed (₹ 2,81,550 - ₹ 1,98,000)	83,550	
Opening stock overvalued (₹ 75,000 - ₹ 53,125)	21,875	
Interest received	38,000	
Rent received	46,000	
Factory overheads over recovered (₹ 4,27,000 - ₹ 4,22,000)	5,000	1,94,425
		2,70,602
Less: Selling & distribution overheads under recovery (₹ 72,000 - ₹ 37,845)	34,155	
Closing stock overvalued (₹ 72,372 - ₹ 45,650)	26,722	
Dividend	1,22,000	
Bad debts	18,000	(2,00,877)
Profit as per financial accounts		69,725

Working notes:

1. Number of units produced

	Units
Sales	12,615
Add: Closing stock	415
Total	13,030
Less: Opening stock	(625)
Number of units produced	12,405

2. Cost Sheet

	(₹)
Raw materials consumed	8,40,000
Direct labour	6,10,000
Prime cost	14,50,000
Factory overheads (70% of direct wages)	4,27,000



Factory cost	18,77,000
Add: Opening work-in-process	46,000
Less: Closing work-in-process	41,200
Factory cost of goods produced	18,81,800
Administration overheads(15% of factory cost)	2,81,550
Cost of production of 12,405 units(Refer to working note 1)	21,63,350
Cost of production per unit:	
$\frac{\text{Total Cost of Production}}{\text{No. of units produced}} = \frac{21,63,350}{12,405 \text{ units}} = ₹174.39$	

Q.105

Control Accounts

RTP May 22



X Ltd. maintains a non-integrated accounting system for the purpose of management information. The following are the data related with year 2021 -22:

Particulars	Amount ('000)
Opening balances:	
- Stores ledger control A/c	48,000
- Work-in-process control A/c	12,000
- Finished goods control A/c	2,58,000
- Building construction A/c	6,000
- Cost ledger control A/c	3,24,000
During the year following transactions took place:	
Materials:	
- Purchased	24,000
- Issued to production	30,000
- Issued to general maintenance	3,600
- Issued to building construction	2,400
Wages:	
- Gross wages paid	90,000
- Indirect wages paid	24,000
- For building construction	6,000
Factory overheads:	
- Actual amount incurred (excluding items shown above)	96,000
- Absorbed in building construction	12,000
- Under-absorbed	4,800
Royalty paid	3,000
Selling distribution and administration overheads	15,000
Sales	2,70,000

At the end of the year, the stock of raw material and work-in-process was ₹3,30,00,000 and ₹15,00,000 respectively. The loss arising in the raw material account is treated as factory overheads. The building under construction was completed during the year. Gross profit margin is 20% on sales.

Required:

PREPARE the relevant control accounts to record the above transactions in the cost ledger of the company.

Ans.

Cost Ledger Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Costing P&L A/c	2,70,000	By Balance b/d	3,24,000
To Building Construction A/c	26,400	By Stores Ledger Control A/c	24,000
To Balance c/d	2,89,800	By Wages Control A/c	90,000
		By Factory overhead control A/c	96,000
		By Royalty A/c	3,000
		By Selling, Distribution and Administration overheads	15,000
		By Costing P&L A/c	34,200
	5,86,200		5,86,200

Stores Ledger Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	48,000	By WIP control A/c	30,000
To Cost Ledger control A/c	24,000	By Factory overheads control A/c	3,600
		By Building construction A/c	2,400
		By Factory overhead control A/c (loss) (Bal. fig)	3,000
		By Balance c/d	33,000
	72,000		72,000

Work-in-process Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	12,000	By Finished goods control A/c	1,99,800
To Stores Ledger control A/c	30,000		
To Wages Control A/c	60,000		
To Factory overhead control A/c	1,09,800		
To Royalty A/c	3,000	By Balance c/d	15,000
	2,14,800		2,14,800

Finished Goods Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	2,58,000	By Cost of Goods Sold A/c (Refer working note)	2,16,000
To WIP control A/c	1,99,800	By Balance c/d	2,41,800
	4,57,800		4,57,800

Cost of Sales Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost of Goods Sold A/c	2,16,000	By Costing P&L A/c	2,31,000
To Selling, Distribution and Administration A/c	15,000		
	2,31,000		2,31,000

Costing P&L Account



Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost of Sales A/c	2,31,000	By Cost Ledger control A/c	2,70,000
To Factory overhead control A/c	4,800		
To Cost Ledger control A/c	34,200		
	2,70,000		2,70,000

Building Construction Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Balance b/d	6,000	By Cost Ledger control A/c	26,400
To Stores Ledger control A/c	2,400		
To Wages Control A/c	6,000		
To Factory overhead control A/c	12,000		
	26,400		26,400

Factory Overhead Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Stores Ledger control A/c	3,600	By Building Construction A/c	12,000
To Wages Control A/c	24,000	By WIP Control A/c	1,09,800
To Cost Ledger control A/c	96,000	By Costing P&L A/c	4,800
To Stores Ledger control A/c (loss)	3,000		
	1,26,600		1,26,600

Wages Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	90,000	By Factory overhead control A/c	24,000
		By Building Construction A/c	6,000
		By WIP Control A/c	60,000
	90,000		90,000

Royalty Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Cost Ledger control A/c	3,000	By WIP Control A/c	3,000
	3,000		3,000

Cost of Goods Sold Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
To Finished Goods control A/c	2,16,000	By Cost of sales A/c	2,16,000
	2,16,000		2,16,000

Selling, Distribution and Administration Overhead Control Account

Particulars	(₹ in '000)	Particulars	(₹ in '000)
-------------	-------------	-------------	-------------

To Cost Ledger control A/c	15,000	By Cost of sales A/c	15,000
	15,000		15,000

Trial Balance

Particulars	Dr.	Cr.
	(₹ in '000)	(₹ in '000)
Stores Ledger Control A/c	33,000	
WIP Control A/c	15,000	
Finished Goods Control A/c	2,41,800	
Cost Ledger Control A/c		2,89,800
	2,89,800	2,89,800

Working Note:

Cost of Goods sold = $2,70,000 \times 80/100 = ₹ 2,16,000$

Q.106

Reconciliation Statement

RTP May 23



The financial records of Riva Private Limited showed a net profit of ₹1,69,500 for the year ended 31st March, 2022. The cost accounts, however, disclosed a net loss of ₹ 88,500 for the same period. The following information were revealed as a result of scrutiny of the figures of cost accounts and financial accounts:

		(₹)
(i)	(Administrative overhead under recovered)	63,750.0
(ii)	Factory overhead over recovered	3,37,500.0
(iii)	Depreciation under charged in Cost Accounts	65,000.0
(iv)	Dividend received	50,000.0
(v)	Loss due to obsolescence charged in Financial Accounts	42,000.0
(vi)	Income tax provided	1,09,000.0
(vii)	Bank interest credited in Financial Accounts	34,000.0
(viii)	Value of opening stock:	
	In Cost Accounts	4,12,500.0
	In Financial Accounts	3,62,500.0
(ix)	Value of closing stock:	
	In Cost Accounts	3,13,750.0
	In Financial Accounts	3,30,000.0
(x)	Goodwill written-off in Financial Accounts	62,500.0
(xi)	Notional rent of own premises charged in Cost Accounts	1,50,000.0
(xii)	Provision for doubtful debts in Financial Accounts	37,500.0

Prepare a reconciliation statement by taking costing net loss as base.

Ans.

Statement of Reconciliation

Sl. No.	Particulars	(₹)	(₹)
---------	-------------	-----	-----



	Net loss as per Cost Accounts		(88,500)
	Additions		
1	Factory O/H over recovered	3,37,500	
2	Dividend Received	50,000	
3	Bank Interest received	34,000	
4	Difference in Value of Opening Stock (4,12,500 - 3,62,500)	50,000	
5	Difference in Value of Closing Stock (3,30,000 - 3,13,7500)	16,250	
6	Notional Rent of own Premises	1,50,000	6,37,750
	Deductions		
1	Administration O/H under recovered	63,750	
2	Depreciation under charged	65,000	
3	Loss due to obsolescence	42,000	
4	Income tax Provided	1,09,000	
5	Goodwill written-off	62,500	
6	Provision for doubtful debts	37,500	(3,79,750)
	Net Profit as per Financial A/c.		1,69,500



13

CHAPTER

JOB & BATCH COSTING

Q.107

Batch Costing: Optimum run

PY Nov 18



XYZ Ltd. has obtained an order to supply 48000 bearings per year from a concern. On a steady basis, it is estimated that it costs ₹ 0.20 as inventory holding cost per bearing per month and the set-up cost per run of bearing manufacture is ₹ 384.

You are required to:

- compute the optimum run size and number of runs for bearing manufacture. (ii) compute the interval between two consecutive runs.
- find out the extra costs to be incurred, if company adopts a policy to manufacture 8000 bearings per run as compared to optimum run size.
- give your opinion regarding run size of bearing manufacture. Assume 365 days in a year.

Ans.

- Optimum batch size or Economic Batch Quantity (EBQ):

$$EBQ = \sqrt{\frac{2DS}{C}} = \sqrt{\frac{2 \times 48000 \times 384}{2.4}} = 3919.18 \text{ or } 3,920 \text{ units}$$

Number of Optimum runs = $48,000 \div 3,920 = 12.245$ or 13 run

- Interval between 2 runs (in days) = $365 \text{ days} \div 13 = 28 \text{ days}$
Or $365 \div 12.24 = 29.82 \text{ days}$

- If 8,000 bearings are manufactures in a run:

$$\begin{aligned} \text{Total cost} &= \text{Set-up cost} + \text{Inventory holding cost} \\ &= ₹ 384 \times (48,000 \div 8,000) + (8,000 \div 2) \times ₹ 2.4 \\ &= \mathbf{2304 + 9,600 = 11,904} \end{aligned}$$

Extra cost = $₹(11,904 - 9,406^*) = ₹ 2,498/-$

OR

Extra cost = $₹ (11,904 - 9,696^*) = ₹ 2,208/-$

* Minimum Inventory Cost = Average Inventory $\times$ Inventory Carrying Cost per unit per annum

Average Inventory = $3,920 \text{ units} \div 2 = 1,960 \text{ units}$

Carrying Cost per unit per annum = $₹ 0.2 \times 12 \text{ months} = ₹ 2.4$

Minimum Inventory Holding Costs = $1,960 \text{ units} \times ₹ 2.4 = ₹ 4,704$

Total cost = Set-up cost + Inventory holding cost = $(12.245 \times 384) + 4704 = ₹ 9,406$

(approx.)

OR

Total cost = Set-up cost + Inventory holding cost = $(13 \times 384) + 4704 = ₹ 9,696$

(approx.)

- To save cost the company should run at optimum batch size i.e. 3,920 Units. It saves ₹ 2,498 or 2208. Run size should match with the Economic production run of bearing manufacture. When managers of a manufacturing operation make decisions about the number of units to produce for each production run, they must consider the costs related to setting up the production process and the costs of holding inventory

Alternative presentation to part 3(a) (iii)

Statement showing Total Cost at Production Run size of 3,600 and 8,000 bearings

A.	Annual requirement	48,000	48,000
B.	Run Size	3,920	8,000
C.	No. of runs (A/B)	12.245	6



D.	Set up cost per run	₹ 384	₹ 384
E.	Total set up cost (CxD)	₹ 4,702	₹ 2,304
F.	Average inventory (B/2)	1,960	4,000
G.	Carrying cost per unit p.a.	2.40	2.40
H.	Total Carrying cost (F×G)	4,704	9,600
I.	Total cost (E+H)	9,406	11,904

Extra cost incurred, if run size is of 8,000= ₹11,904-9,406= ₹ 2,498

Q.108

Job Cost Sheet & Sp.

PY Nov 19



The following data is presented by the supervisor of a factory for a Job:

	₹ per unit
Direct Material	120
Direct Wages @ ₹ 4 per hour	
(Departments A-4 hrs, B-7 hrs, C-2 hrs & D-2 hrs)	60
Chargeable Expenses	20
Total	200

**Analysis of the Profit and Loss Account for the year ended
31st March, 2019**

Material		2,00,000	Sales	4,30,000
Direct Wages				
Dept. A	12,000			
Dept. B	8,000			
Dept. C	10,000			
Dept. D	20,000	50,000		
Special Store items		6,000		
Overheads				
Dept. A	12,000			
Dept. B	6,000			
Dept. C	9,000			
Dept. D	17,000	44,000		
Gross Profit c/d		1,30,000		
		4,30,000		4,30,000
Selling Expenses		90,000		1,30,000
Net Profit		40,000	Gross Profit b/d	
		1,30,000		1,30,000

It is also to be noted that average hourly rates for all the four departments are similar. Required:

- Prepare a Job Cost Sheet.
- Calculate the entire revised cost using the above figures as the base.
- Add 20% profit on selling price to determine the selling price.

Ans.

(b) Job Cost Sheet

Customer Details ----

Date of commencement ---

Job No. _____

Date of completion _____

Particulars		Amount (₹)
Direct materials		120
Direct wages:		
Deptt. A ₹ 4.00 × 4 hrs.	₹ 16.00	
Deptt. B ₹ 4.00 × 7 hrs.	₹ 28.00	
Deptt. C ₹ 4.00 × 2 hrs.	₹ 8.00	
Deptt. D ₹ 4.00 × 2 hrs.	₹ 8.00	60
Chargeable expenses		20
Prime cost		200
Overheads		
Deptt. A = $\frac{12000}{12000} \times 100 = 100\%$ of ₹ 16	₹ 16	
Deptt. B = $\frac{6000}{8000} \times 100 = 75\%$ of ₹ 28	₹ 21	
Deptt. C = $\frac{9000}{10000} \times 100 = 90\%$ of ₹ 8 = $\frac{9000}{10000} \times 100 = 90\%$ of ₹ 8 = ₹ 7.20	₹ 7.20	
Deptt. D = $\frac{17000}{20000} \times 100 = 85\%$ of ₹ 8	₹ 6.80	51.00
Works cost		251.00
Selling expenses = 100 = 30% of work cost		75.30
Total cost		326.30
Profit (20% profit on selling price i.e 25% of total cost)		81.58
Selling price		407.88

Q.109

Cost & SP Per Each

RTP May 18



Arnav Confectioners (AC) owns a bakery which is used to make bakery items like pastries, cakes and muffins. AC use to bake at least 50 units of any item at a time. A customer has given an order for 600 cakes. To process a batch, the following cost would be incurred:

- Direct materials - ₹ 5,000
- Direct wages - ₹ 500 (irrespective of units)
- Oven set-up cost - ₹ 750 (irrespective of units)

AC absorbs production overheads at a rate of 20% of direct wages cost. 10% is added to the total production cost of each batch to allow for selling, distribution and administration overheads.

AC requires a profit margin of 25% of sales value.



Required:

- DETERMINE the price to be charged for 600 cakes.
- CALCULATE cost and selling price per cake.
- DETERMINE what would be selling price per unit If the order is for 605 cakes.

Ans.

Statement of cost per batch and per order

No. of batch = 600 units ÷ 50 units = 12 batches

	Particulars	Cost per batch (₹)	Total Cost (₹)
	Direct Material Cost	5,000.00	60,000
	Direct Wages	500.00	6,000
	Oven set-up cost	750.00	9,000
	Add: Production Overheads (20% of Direct wages)	100.00	1,200
	Total Production cost	6,350.00	76,200
	Add: S&D and Administration overheads (10% of Total production cost)	635.00	7,620
	Total Cost	6,985.00	83,820
	Add: Profit (1/3rd of total cost)	2,328.33	27,940
(i)	Sales price	9,313.33	1,11,760
	No. of units in batch	50 units	
(ii)	Cost per unit (₹6,985 ÷ 50 units)	139.70	
	Selling price per unit (9,313.33 ÷ 50 units)	186.27	

- If the order is for 605 cakes, then selling price per cake would be as below:

Particulars	Total Cost (₹)
Direct Material Cost	60,500
Direct Wages (₹500 × 13 batches)	6,500
Oven set-up cost (₹750 × 13 batches)	9,750
Add: Production Overheads (20% of Direct wages)	1,300
Total Production cost	78,050
Add: S&D and Administration overheads (10% of Total production cost)	7,805
Total Cost	85,855
Add: Profit (1/3rd of total cost)	28,618
Sales price	1,14,473
No. of units	605 units
Selling price per unit (₹1,14,473 ÷ 605 units)	189.21

Q.110

Total Cost for Job & Price

RTP Nov 20



AP Ltd. received a job order for supply and fitting of plumbing materials. Following are the details related with the job work:

Direct Materials

AP Ltd. uses a weighted average method for the pricing of materials issues. Opening stock of materials as on 12th August 2020:

- 15mm GI Pipe, 12 units of (15 feet size) @ ₹600 each

- 20mm GI Pipe, 10 units of (15 feet size) @ ₹ 660 each
- Other fitting materials, 60 units @ ₹ 26 each
- Stainless Steel Faucet, 6 units @ ₹ 204 each
- Valve, 8 units @ ₹ 404 each

Purchases:
On 16th August 2020:

- 20mm GI Pipe, 30 units of (15 feet size) @ ₹ 610 each
- 10 units of Valve @ ₹ 402 each

On 18th August 2020:

- Other fitting materials, 150 units @ ₹ 28 each
- Stainless Steel Faucet, 15 units @ ₹ 209 each

On 27th August 2020:

- 15mm GI Pipe, 35 units of (15 feet size) @ ₹ 628 each
- 20mm GI Pipe, 20 units of (15 feet size) @ ₹ 660 each
- Valve, 14 units @ ₹ 424 each

Issues for the hostel job:

On 12th August 2020:

- 20mm GI Pipe, 2 units of (15 feet size)
- Other fitting materials, 18 units

On 17th August 2020:

- 15mm GI Pipe, 8 units of (15 feet size)
- Other fitting materials, 30 units

On 28th August 2020:

- 20mm GI Pipe, 2 units of (15 feet size)
- 15mm GI Pipe, 10 units of (15 feet size)
- Other fitting materials, 34 units
- Valve, 6 units

On 30th August 2020:

- Other fitting materials, 60 units
- Stainless Steel Faucet, 15 units

Direct Labour:

Plumber: 180 hours @ ₹100 per hour (includes 12 hours overtime)

Helper: 192 hours @ ₹70 per hour (includes 24 hours overtime)

Overtimes are paid at 1.5 times of the normal wage rate.

Overheads:

Overheads are applied @ ₹26 per labour hour.

Pricing policy:

It is company's policy to price all orders based on achieving a profit margin of 25% on sales price.

You are required to

- (a) CALCULATE the total cost of the job.
- (b) CALCULATE the price to be charged from the customer.

Ans.
(a) Calculation of Total Cost for the Job:

Particulars	Amount (₹)	Amount (₹)
Direct Material Cost:		
- 15mm GI Pipe (Working Note- 1)	11,051.28	
- 20mm GI Pipe (Working Note- 2)	2,588.28	
- Other fitting materials (Working Note- 3)	3,866.07	
- Stainless steel faucet		



15 units $\times \left(\frac{6 \times 204 + 15 \times 209}{21 \text{ units}} \right)$	3,113.57	
- Valve 6 units $\times \left(\frac{8 \times 404 + 10 \times 402 + 14 \times 424}{32 \text{ units}} \right)$	2,472.75	23,091.95
Direct Labour:		
- Plumber [(180 hours $\times$ ₹100) + (12 hours $\times$ ₹50)]	18,600.00	
- Helper [(192 hours $\times$ ₹70) + (24 hours $\times$ ₹35)]	14,280.00	32,880.00
- Overheads [₹26 $\times$ (180 + 192) hours]		9,672.00
Total Cost		65,643.95

(b) Price to be charged for the job work:

	Amount (₹)
Total Cost incurred on the job	65,643.95
Add: 25% Profit on Job Price $\left(\frac{65,643.95}{75\%} \times 25\% \right)$	21,881.32
	87,525.27

Working Note:

1. Cost of 15mm GI Pipe

Date		Amount (₹)
17-08-2020	8 units $\times$ ₹ 600	4,800.00
28-08-2020	10 units $\times \left(\frac{4 \times 600 + 35 \times 628}{39 \text{ units}} \right)$	6,251.28
		11,051.28

2. Cost of 20mm GI Pipe

Date		Amount (₹)
12-08-2020	2 units $\times$ ₹ 660	1,320.00
28-08-2020	2 units $\times \left(\frac{8 \times 660 + 30 \times 610 + 20 \times 660}{58 \text{ units}} \right)$	1,268.28
		2,588.28

3. Cost of Other fitting materials

Date		Amount (₹)
12-08-2020	18 units $\times$ ₹ 26	468.00
17-08-2020	30 units $\times$ ₹ 26	780.00
28-08-2020	34 units $\times \left(\frac{12 \times 26 + 150 \times 28}{162 \text{ units}} \right)$	946.96
30-08-2020	60 units $\times \left(\frac{12 \times 26 + 150 \times 28}{162 \text{ units}} \right)$	1,671.11
		3,866.07

Q.111

Cost & Profit Per Batch

RTP May 23



A jobbing factory has undertaken to supply 200 pieces of a component per month for the ensuing six months. Every month a batch order is opened against which materials and labour hours are booked at actual. Overheads are levied at a rate per labour hour. The selling price contracted for is ₹ 80 per piece. From the following data. COMPUTE the cost and profit per piece of each batch order and overall position of the order for 1,200 pieces.

Month	Batch Output (Pieces)	Material cost	Direct wages	Direct labour
		(₹)	(₹)	(Hours)
January	210	6,500	1,200	240
February	200	6,400	1,400	280
March	220	6,800	1,500	280
April	180	6,300	1,400	270
May	200	7,000	1,500	300
June	220	7,200	1,600	320

The other details are:

Month	Chargeable expenses	Direct labour
	(₹)	Hours
January	1,20,000	4,800
February	1,05,600	4,400
March	1,20,000	5,000
April	1,05,800	4,600
May	1,30,000	5,000
June	1,20,000	4,800

Ans.

Particulars	Jan. (₹)	Feb. (₹)	March (₹)	April (₹)	May (₹)	June (₹)	Total (₹)
Batch output (in pieces)	210	200	220	180	200	220	1,230
Sale value @ ₹80	16,80	16,00	17,60	14,40	16,00	17,60	98,40
Material cost	6,500	6,400	6,800	6,300	7,000	7,200	40,20
Direct wages	1,200	1,400	1,500	1,400	1,500	1,600	8,600
Chargeable expenses*	6,000	6,720	6,720	6,210	7,800	8,000	41,45
Total cost	13,70	14,52	15,02	13,91	16,30	16,80	90,25
Profit per batch	3,100	1,480	2,580	490	(300)	800	8,150
Total cost per piece	65.2	72.6	68.3	77.3	81.5	76.4	73.4
Profit per piece	14.8	7.4	11.7	2.7	(1.5)	3.6	6.6

Overall position of the order for 1,200 pieces

Sales value of 1,200 pieces @ ₹ 80 per piece ₹ 96,000

Total cost of 1,200 pieces @ ₹ 73.4 per piece ₹ 88,080

Profit ₹ 7,920

* $\frac{\text{Chargeable expenses}}{\text{Direct labour hour for the month}} \times \text{Direct labour hours for batch}$