

PAPER – 3: COST AND MANAGEMENT ACCOUNTING

QUESTIONS

Material Cost

1. 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?

Employee Cost

2. 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

Overheads: Absorption Costing Method

- 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:

- (i) DETERMINE the production and sales quantities of both products 'A' and 'B' for the above year.
- (ii) 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.
- (iii) 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.

Activity Based Costing

- 4. 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:

Traditional Income Statement					(in ₹)
	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:

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	<u>4,00,000</u>
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 –

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

Cost Sheet

5. CT Limited is engaged in producing medical equipment. It has furnished following details related to its products produced during a month:

	Units	Amount (₹)
Raw materials		
Opening stock	1,000	90,00,000
Purchases	49,000	44,10,00,000
Closing stock	1,750	1,57,50,000
Works-in-progress		
Opening	2,000	1,75,50,000
Closing	1,000	94,50,000
Direct employees' wages, allowances etc.		6,88,50,000
Primary packaging cost (per unit)		1,440
R&D expenses & Quality control expenses		2,10,60,000
Consumable stores, depreciation on plant		3,42,00,000
Administrative overheads related to production		3,15,00,000
Selling expenses		4,84,30,800
Royalty paid for production		3,64,50,000
Cost of web-site (for online sale) maintenance		60,75,000
Secondary packaging cost (per unit)		225

There was a normal scrap of 250 units of direct material which realized ₹ 5,400 per unit. The entire finished product was sold at a profit margin of 20% on sales.

You are required to PREPARE a cost sheet showing:

- (i) Prime cost

- (ii) Gross works cost
- (iii) Factory costs
- (iv) Cost of production
- (v) Profit
- (vi) Sales

Cost Accounting System

6. The financial books of a company reveal the following data for the financial year ending on 31st March, 2022:

	(₹)
Opening Stock:	
Finished goods 875 units	1,48,750
Work-in-process	64,000
01.04.2021 to 31.3.2022	
Raw materials consumed	15,60,000
Direct Labour	9,00,000
Factory overheads	6,00,000
Goodwill written off	2,00,000
Administration overheads	5,90,000
Dividend paid	1,70,000
Bad Debts	24,000
Selling and Distribution Overheads	1,22,000
Interest received	90,000
Rent received	36,000
Sales 14,500 units	41,60,000
Closing Stock: Finished goods 375 units	82,500
Work-in-process	77,334

The cost records provide as under:

- Factory overheads are absorbed at 60% of direct wages.
- Administration overheads are recovered at 20% of factory cost.
- Selling and distribution overheads are charged at ₹ 8 per unit sold.
- Opening Stock of finished goods is valued at ₹ 208 per unit.

A machine costing ₹ 13,00,000 has been on the site for 4.8 months, its working life is estimated at 7 years and its final scrap value at ₹ 75,000.

A supervisor, who is paid ₹ 40,000 p.m. has devoted one-half of his time to this contract.

All other expenses and administration charges amount to ₹ 6,82,500.

Material in hand at site costs ₹ 1,77,000 on 31st March, 2022.

The contract price is ₹ 1,00,00,000. On 31st March, 2022 2/3rd of the contract was completed. The architect issued certificates covering 50% of the contract price, and the contractor had been paid ₹ 37,50,000 on account.

PREPARE Contract A/c and show the notional profit or loss as on 31st March, 2022.

Process Costing

9. SM Pvt. Ltd. manufactures their products in three consecutive processes. The details are as below:

	Process A	Process B	Process C
Transferred to next Process	60%	50%	
Transferred to warehouse for sale	40%	50%	100%

In each process, there is a weight loss of 2% and scrap of 8% of input of each process. The realizable value of scrap of each process is as below:

Process A @ ₹ 2 per ton

Process B @ ₹ 4 per ton

Process C @ ₹ 6 per ton.

The following particulars relate to April, 2022:

	Process A	Process B	Process C
Materials used (in Tons)	1,000	260	140
Rate per ton	₹ 20	₹ 15	₹ 10
Direct Wages	₹ 4,000	₹ 3,000	₹ 2,000
Direct Expenses	₹ 3,160	₹ 2,356	₹ 1,340

PREPARE Process Accounts- A, B and C & calculate cost per ton at each process.

Joint Products & By Products

10. JP Ltd. uses joint production process that produces three products at the split-off point. Joint production costs during the month of July, 2022 were ₹ 33,60,000.

Product information for the month of July is as follows:

Particulars	Product A	Product B	Product C
Units produced	3,000	6,000	9,000
Sales prices:			
At the split-off	₹ 200		
After further processing	₹ 300	₹ 350	₹ 100
Costs to process after split-off	₹ 6,00,000	₹ 6,00,000	₹ 6,00,000

Other information is as follows:

Product C is a by-product and the company accounts for the by-product at net realizable value as a reduction of joint cost. Further, Product B & C must be processed further before they can be sold. FIND OUT the joint cost allocated to Product A in the month of July if joint cost allocation is based on Net Realizable Value.

Service Costing

11. Royal Transport Services runs fleet of buses within the limits of Jaipur city. The following are the details which were incurred by the company during October, 2021:

	(₹)
Cost of each Bus	24,00,000
Garage Rent	1,00,000
Insurance	25,000
Road tax	20,000
Manager's Salary	60,000
Assistant's Salary (Two)	32,000 each
Supervisor's Salary (Three)	24,000 each
Driver's Salary (Twenty-Five)	20,000 each
Cleaner's Salary (Twenty)	5,000 each
Office Staff's Salary	1,00,000
Consumables	1,20,000
Repairs & Maintenance	90,000
Other Fixed Expenses	72,000
Diesel (10 Kms per Litre)	80 per litre
Oils & Lubricants	1,45,000

Tyres and tubes	35,000
Depreciation	10% p.a. on Cost

Other details are as below:

	Capacity
12 Buses	60 Passengers
13 Buses	50 Passengers

Each bus makes 4 round trips a day covering a distance of 10 Kilometers in each trip (One Way) on an average. During the trips 80% of the seats are occupied. The annual records show that 5 buses are generally required to be kept away from roads each day for repairs.

You are required to CALCULATE cost per passenger-km.

Cost sheet to be prepared on the basis of 25 buses.

Standard Costing

12. Ahaan Limited operates a system of standard costing in respect of one of its products 'AH1' which is manufactured within a single cost centre. Details of standard per unit are as follows:

- The standard material input is 20 kilograms at a standard price of ₹ 24 per kilogram.
- The standard wage rate is ₹ 72 per hour and 5 hours are allowed to produce one unit.
- Fixed production overhead is absorbed at the rate of 100% of wages cost.

During the month of April 2022, the following was incurred:

- Actual price paid for material purchased @ ₹ 22 per kilogram.
- Total direct wages cost was ₹ 43,92,000
- Fixed production overhead cost incurred was ₹ 45,00,000

Analysis of variances was as follows:

Variations	Favourable	Adverse
Direct material price	₹ 4,80,000	-
Direct material usage	₹ 48,000	
Direct labour rate	-	₹ 69,120
Direct labour efficiency	₹ 33,120	-
Fixed production overhead expenditure		₹ 1,80,000

You are required to CALCULATE the following for the month of April, 2022

- (i) Material cost variance

- (ii) Budgeted output (in units)
- (iii) Quantity of raw materials purchased (in kilograms)
- (iv) Actual output (in units)
- (v) Actual hours worked
- (vi) Actual wage rate per labour hour
- (vii) Labour cost variance
- (viii) Production overhead cost variance

Marginal Costing

13. (a) RPP Manufacturers is approached by an international customer for one-time special order similar to one offered to its domestic customers. Per unit data for sales to regular customers is provided below:

Direct material	₹ 693
Direct labour	₹ 315
Variable manufacturing support	₹ 504
Fixed manufacturing support	<u>₹ 1092</u>
Total manufacturing costs	₹ 2604
Markup (50%)	<u>₹ 1302</u>
Targeted selling price	<u>₹ 3906</u>

It is provided that RPP Manufacturers has excess capacity.

Required:

- (i) WHAT is the full cost of the product per unit?
- (ii) WHAT is the contribution margin per unit?
- (iii) WHICH costs are relevant for making the decision regarding this one-time special order? WHY?
- (iv) For RPP Manufacturers, WHAT is the minimum acceptable price of this one-time-special order only
- (v) For this one-time-only special order, SHOULD RPP Manufacturers consider a price of ₹ 2100 per unit? WHY or why not?

- (b) The lab corner of Newlife Hospital Trust operates two types of specialist MRI scanning machine- MR10 and MR59. Following details are estimated for the next period:

Machine	MR10	MR59
Running hours	1,100	2,000
	(₹)	(₹)
Variable running costs excluding special technology	68,750	1,60,000
Fixed Costs	50,000	2,43,750

A brain scan is normally carried out on machine type MR10. This task uses special technology costing ₹ 100 each and takes four hours of machine time. Because of the nature of the process, around 10% of the scans produce blurred and therefore useless results.

Required:

- CALCULATE the total cost of a satisfactory brain scan on machine type MR10.
- Brain scans can also be done on machine type MR59 and would take only 1.8 hours per scan with a reduced reject rate of 6%. However, the cost of the special technology would be ₹ 137.50 per scan. ADVISE which type should be used, assuming sufficient capacity is available on both types of machines. Consider fixed costs will remain unchanged.

Budget and Budgetary Control

14. Following information is available for DK and Co.:

Standard working hours	9 hours per day of 5 days per week
Maximum capacity	50 employees
Actual working	40 employees
Actual hours expected to be worked per four week	7,200 hours
Std. hours expected to be earned per four weeks	9,000 hours
Actual hours worked in the four- week period	6,750 hours
Standard hours earned in the four- week period	7,875 hours.

The related period is of 4 weeks. In this period there was a one special day holiday due to national event.

You are required to CALCULATE the following ratios:

- Efficiency Ratio
- Activity Ratio

- (iii) Calendar Ratio
- (iv) Standard Capacity Usage Ratio
- (v) Actual Capacity Usage Ratio
- (vi) Actual Usage of Budgeted Capacity Ratio

Miscellaneous

15. (a) Health Wealth Hospital is interested in estimating the cost for each patient stay. The hospital offers general health care facility i.e. only basic services.

You are required to:

- (i) CLASSIFY each of the following costs as either direct or indirect with respect to each patient.
- (ii) CLASSIFY each of the following costs as either fixed or variable with respect to hospital costs per day.

	Direct	Indirect	Fixed	Variable
Electronic monitoring	_____	_____	_____	_____
Meals for patients	_____	_____	_____	_____
Nurses' salaries	_____	_____	_____	_____
Parking maintenance	_____	_____	_____	_____
Security	_____	_____	_____	_____

- (b) Differentiate between Cost Control and Cost Reduction.
- (c) Though Cost Accounting and Management Accounting is used synonymously but there are a few differences. Elaborate those differences.
- (d) What are cost units? Write the cost unit basis against each of the following Industry/Product-Automobile, Steel, Cement, Chemicals, Power and Transport.

SUGGESTED ANSWERS

1. 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 x 365 days = 14,600 Kgs

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

Ordering Cost (O): ₹ 200 per Order

$$\begin{aligned} \text{EOQ} &= \sqrt{\frac{2 \times A \times O}{C}} \\ &= \sqrt{\frac{2 \times 14,600 \times 200}{14}} = 646 \text{ Kgs.} \end{aligned}$$

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

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

$$\begin{aligned} \text{(d) Minimum Stock Level} &= \text{Recorder Level} - (\text{Average consumption Rate} \times \text{Average Procurement Time}) \\ &= 450 \text{ kgs} - (40 \text{ kgs} \times 7 \text{ days}) \\ &= 170 \text{ kgs} \end{aligned}$$

$$\begin{aligned} \text{(e) Average Stock Level} &= \frac{\text{Maximum Stock Level} + \text{Minimum Stock Level}}{2} \\ &= \frac{946 \text{ kgs} + 170 \text{ kgs}}{2} \\ &= 558 \text{ kgs} \end{aligned}$$

(f) Number of Orders to be placed per year

$$\begin{aligned} &= \frac{\text{Annual Consumption of Raw Materials}}{\text{EOQ}} \\ &= \frac{14600 \text{ kgs}}{646 \text{ kgs}} \end{aligned}$$

= 22.60 Orders or 23 Orders

(g) Total Inventory Cost

Cost of Materials (A x Purchase Price) (14600 kgs x ₹ 100)=	₹ 14,60,000
Total Ordering Cost (No. of Orders x O) (23 Orders x 200) =	₹ 4,600
Total Carrying Cost (EOQ / 2 x C) (646 kgs / 2 x ₹ 14) =	<u>₹ 4,522</u>
Total Inventory Cost	<u>₹ 14,69,122</u>

(h) If the supplier is willing to offer 1% discount on purchase of total annual quantity in two orders:

Offer Price = ₹ 100 x 99%	= ₹ 99
Revised Carrying Cost = (₹ 99 x 1% x 12 months) + ₹ 2	= ₹ 13.88
Revised Order Quantity = 14600 kgs / 2 Orders	= 7300 kgs

Total Inventory Cost at Offer Price

Cost of Materials (A x Purchase Price) (14600 kgs x ₹ 99)	= ₹ 14,45,400
Total Ordering Cost (No. of Orders x O) (2 Orders x 200)	= ₹ 400
Total Carrying Cost (EOQ / 2 x C) (7300 kgs / 2 x ₹13.88)	= <u>₹ 50,662</u>
Total Inventory Cost	<u>₹ 14,96,462</u>

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) x 1% x 12 months] + ₹ 2 = ₹ 12 – 0.12z + ₹ 2	
= ₹ 14 – 0.12z	

Total Inventory Cost at Counter-Offer Price

Cost of Materials (A x Purchase Price) [14600 kgs x (₹ 100 – z)] = ₹ 14,60,000 – 14,600z	
Total Ordering Cost (No. of Orders x O) (2 Orders x 200) = ₹ 400	
Total Carrying Cost (EOQ / 2 x C) [7300 kgs / 2 x (₹ 14 – 0.12z)] = <u>₹ 51,100 – 438z</u>	
Total Inventory Cost	<u>₹ 15,11,500 – 15038z</u>

$$₹ 14,69,122 = ₹ 15,11,500 - 15038z$$

$$\text{Or } 15038z = 42,378$$

$$\text{Or } z = 2.82$$

Therefore, discount should be at least 2.82% in offer price.

2. 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:

$$\begin{aligned} \text{Replacement Method} &= \frac{\text{No. of employees replaced during the year}}{\text{Average no. of employees on roll}} \times 100 \\ &= \frac{165}{(1,158+2,694)/2} \times 100 = \frac{165}{1,926} \times 100 = 8.57\% \end{aligned}$$

$$\begin{aligned} \text{Separation Method} &= \frac{\text{No. of employees separated during the year}}{\text{Average no. of employees on roll}} \times 100 \\ &= \frac{315}{1,926} \times 100 = 16.36\% \end{aligned}$$

(b) Labour Turnover rate under Flux Method:

$$\begin{aligned} &= \frac{\text{No. of employees (Joined + Separated) during the year}}{\text{Average no. of employees on roll}} \times 100 \\ &= \frac{\text{No. of employees (Replaced + New recruited + Separated) during the year}}{\text{Average no. of employees on roll}} \times 100 \\ &= \frac{1,851+315}{1,926} \times 100 = 112.46\% \end{aligned}$$

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.

3. (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

(ii) **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 x 5 hours x ₹ 20.40 = ₹ 1,83,600	Pie = 1,800 units x 4 hours x ₹ 28.80 = ₹ 2,07,360 Qui = 1,800 units x 1 hour x ₹ 12 = ₹ 21,600	(-) ₹ 45,360
B	5,400 units	5,400 x 5 hours x ₹ 20.40 = ₹ 5,50,800	Pie = 5,400 units x 1 hour x ₹ 28.80 = ₹ 1,55,520	(+) ₹ 1,36,080

			Qui = 5,400 units x 4 hours x ₹12 = ₹ 2,59,200	
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.

(iii) 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	₹ 35.28
	Under-Priced	Over-Priced

Workings:

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

(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

4. (i) Calculation of operating income using Activity Based Costing

Calculation of Cost-Driver rate

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

$$* (100 \times 4) + (100 \times 1) + (76 \times 6) + (24 \times 4)$$

$$= (400 + 100 + 456 + 96)$$

$$= 1052 \text{ setup hours}$$

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 x 100)	9,33,333 (9,333.33 x 100)	7,09,334 (9,333.33 x 76)	2,24,000 (9,333.33 x 24)	28,00,000
- 40% based on Setup hours	8,51,711 (2,129.28 x 400)	2,12,928 (2,129.28 x 100)	9,70,951 (2,129.28 x 456)	2,04,410 (2,129.28 x 96)	22,40,000
- 10% based on number of parts	1,40,000 (1,40,000 x 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 x 100)	5,33,333 (5,333.33 x 100)	4,05,334 (5,333.33 x 76)	1,28,000 (5,333.33 x 24)	16,00,000
- 20% based on number of parts	1,00,000 (1,00,000 x 1)	1,00,000	1,00,000	1,00,000	4,00,000
Machinery depreciation	8,00,000 (80 x 0.1 x 1,00,000)	6,40,000 (80 x 0.1 x 80,000)	1,44,000 (80 x 0.1 x 18,000)	16,000 (80 x 0.1 x 2,000)	16,00,000
Machine Maintenance	4,00,000 (40 x 0.1 x 1,00,000)	3,20,000 (40 x 0.1 x 80,000)	72,000 (40 x 0.1 x 18,000)	8,000 (40 x 0.1 x 2,000)	8,00,000

Energy Machinery for	2,00,000 (20 x 0.1 x 1,00,000)	1,60,000 (20 x 0.1 x 80,000)	36,000 (20 x 0.1 x 18,000)	4,000 (20 x 0.1 x 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.

5.

Cost Sheet

Particulars	Units	Amount (₹)
Material		
Opening stock	1,000	90,00,000
Add: Purchases	49,000	44,10,00,000
Less: Closing stock	(1,750)	(1,57,50,000)
	48,250	43,42,50,000
Less: Normal wastage of materials realized @ ₹ 5,400 per unit	(250)	(13,50,000)
Material consumed		43,29,00,000
Direct employee's wages and allowances		6,88,50,000
Direct expenses- Royalty paid for production		3,64,50,000
Prime cost	48,000	53,82,00,000
Factory overheads - Consumable stores, depreciation etc.		3,42,00,000
Gross Works Cost	48,000	57,24,00,000
Add: Opening WIP	2,000	1,75,50,000
Less: Closing WIP	(1,000)	(94,50,000)
Factory/Works Cost	49,000	58,05,00,000
Administration Overheads related to production		3,15,00,000
R&D expenses and Quality control cost		2,10,60,000
Add: Primary packaging cost @ ₹ 1,440 per unit		7,05,60,000
Cost of production	49,000	70,36,20,000

Selling expenses		4,84,30,800
Cost of maintaining website for online sale		60,75,000
Secondary packaging cost @ ₹ 225 per unit	49,000	1,10,25,000
Cost of sales		76,91,50,800
Add: Profit @ 20% on sales or 25% of cost		19,22,87,700
Sales value		96,14,38,500

6. (i) **Statement of Profit as per financial records**
(for the year ended March 31, 2022)

	(₹)		(₹)
To Opening stock:		By Sales	41,60,000
Finished Goods	1,48,750	By Closing stock:	
Work-in-process	64,000	Finished Goods	82,500
To Raw materials consumed	15,60,000	Work-in-Process	77,334
To Direct labour	9,00,000	By Rent received	36,000
To Factory overheads	6,00,000	By Interest received	90,000
To Goodwill written off	2,00,000		
To Administration overheads	5,90,000		
To Selling & distribution overheads	1,22,000		
To Dividend paid	1,70,000		
To Bad debts	24,000		
To Profit	67,084		
	44,45,834		44,45,834

- Statement of Profit as per costing records**
(for the year ended March 31,2022)

	(₹)	(₹)
Sales revenue (14,500 units) (A)		41,60,000
<u>Cost of Sales:</u>		
Opening stock (875 units x ₹ 208)	1,82,000	
Add: Cost of production of 14,000 units (Refer to Working Note 1 & 2)	35,84,000	

Less: Closing stock $\left(\frac{₹ 35,84,000 \times 375 \text{ units}}{14,000 \text{ units}}\right)$	(96,000)	
Production cost of goods sold (14,500 units)	36,70,000	
Selling & distribution overheads (14,500 units x ₹ 8)	1,16,000	
Cost of sales: (B)		37,86,000
Profit: {(A) – (B)}		3,74,000

(ii)

Statement of Reconciliation**(Reconciling the profit as per costing records with the profit as per financial records)**

	(₹)	(₹)
Profit as per Cost Accounts		3,74,000
Add: Admin. overheads over absorbed (₹ 5,97,333 – ₹ 5,90,000)	7,333	
Opening stock overvalued (₹ 1,82,000 – ₹ 1,48,750)	33,250	
Interest received	90,000	
Rent received	36,000	1,66,583
		5,40,583
Less: Factory overheads under recovery (₹ 6,00,000 – ₹ 5,40,000)	60,000	
Selling & distribution overheads under recovery (₹ 1,22,000 – ₹ 1,16,000)	6,000	
Closing stock overvalued (₹ 96,000 – ₹ 82,500)	13,500	
Goodwill written off	2,00,000	
Dividend	1,70,000	
Bad debts	24,000	4,73,500
Profit as per financial accounts		67,083

Working Notes:

1. Number of units produced	Units
Sales	14,500
Add: Closing stock	<u>375</u>
Total	14,875
Less: Opening stock	<u>875</u>
Number of units produced	<u>14,000</u>

2. Cost Sheet

	(₹)	(₹)
Raw materials consumed		15,60,000
Direct labour		9,00,000
Prime cost		24,60,000
Factory overheads (60% of direct wages)		5,40,000
Factory cost		30,00,000
Add: Opening work-in-process		64,000
Less: Closing work-in-process		77,334
Factory cost of goods produced		29,86,666
Administration overheads (20% of factory cost)		5,97,333
Cost of production of 14,000 units		35,83,999

$$\text{Cost of production per unit} = \frac{\text{Total Cost of Production}}{\text{No. of units produced}} = \frac{\text{₹ } 35,83,999}{14,000 \text{ units}} = \text{₹ } 256$$

7. Statement showing selling price per unit of Batch number 'PS143'

Particulars	Amount (₹)	Amount (₹)
Direct Materials		2,00,000
Direct Labour		
Department A 800 labour hours @ ₹100 per hour	80,000	
Department B 1400 labour hours @ ₹120 per hour	1,68,000	2,48,000
Factory overheads		
Department A 800 labour hours @ ₹140 per hour	1,12,000	
Department B 1400 labour hours @ ₹80 per hour	1,12,000	2,24,000
Factory Cost		6,72,000
Add: Administrative overheads (10% of selling price) (6,72,000/75% x 10%)		89,600
Cost of production		7,61,600
Add: Profit (15% of selling price) (6,72,000/75% x 15%)		1,34,400
Selling price of batch no 'PS143'		8,96,000
Selling price per unit (8,96,000 / 1000 units)		896

Alternatively, selling price calculation:- Selling price assume X

$$\begin{aligned} 25\% &= (X - \text{factory cost}) / X \\ \text{or } 0.25 X &= X - 6,72,000 \\ \text{or } 0.75 X &= 6,72,000 \\ \text{hence } X &= ₹ 8,96,000 \end{aligned}$$

8. **Contract Account**

Particulars		(₹)	Particulars		(₹)
To	Material issued	12,55,000	By	Machine (Working note 1)	12,30,000
"	Wages	28,28,000	"	Material (in hand)	1,77,000
"	Foreman's salary	4,06,500	"	Works cost (balancing figure)	52,45,000
"	Machine	13,00,000			
"	Supervisor's salary (₹ 40,000 × 9)/2	1,80,000			
"	Administrative charges	6,82,500			
		66,52,000			66,52,000
"	Works cost	52,45,000	"	Value of work certified	50,00,000
"	Costing P&L A/c (Notional profit)	10,66,250	"	Cost of work uncertified (Working Note 2)	13,11,250
		63,11,250			63,11,250

Working notes:

1. Written down value of Machine:

$$\text{Depreciation} = \frac{₹ 13,00,000 - 75,000}{7 \text{ years}} \times \frac{4.8 \text{ months}}{12 \text{ months}} = ₹ 70,000$$

Hence the value of machine after the period of 4.8 months = ₹ 13,00,000 – ₹ 70,000 = ₹ 12,30,000

2. The cost of 2/3rd of the contract is ₹ 52,45,000

$$\therefore \text{Cost of 100\% of the contract is } \frac{₹ 52,45,000}{2} \times 3 = ₹ 78,67,500$$

\therefore Cost of 50% of the contract which has been certified by the architect is ₹ 39,33,750.
Also, the cost of 1/3rd of the contract, which has been completed but not certified by the architect is ₹ 13,11,250.

9.

Process A Account

Particulars	Tones	Amount (₹)	Particulars	Tones	Amount (₹)
To Materials	1,000	20,000	By Weight Loss	20	---
To Wages		4,000	By Scrap	80	160
To Direct Expenses		3,160	By Process B	540	16,200
			By Warehouse	360	10,800
Total	1,000	27,160	Total	1,000	27,160

$$\begin{aligned}
 \text{Cost per Tonne} &= \frac{27,160 - 160}{1,000 - 20 - 80} \\
 &= \frac{27,000}{900} \\
 &= ₹ 30 \text{ per ton}
 \end{aligned}$$

Process B Account

Particulars	Tones	Amount (₹)	Particulars	Tones	Amount (₹)
To Process A	540	16,200	By Weight Loss	16	---
To Materials	260	3,900	By Scrap	64	256
To Wages		3,000	By Process C	360	12,600
To Direct Expenses		2,356	By Warehouse	360	12,600
Total	800	25,456	Total	800	25,456

$$\begin{aligned}
 \text{Cost per Tonne} &= \frac{25,456 - 256}{800 - 16 - 64} \\
 &= \frac{25,200}{720} \\
 &= ₹ 35 \text{ per ton}
 \end{aligned}$$

Process C Account

Particulars	Tones	Amount (₹)	Particulars	Tones	Amount (₹)
To Process B	360	12,600	By Weight Loss	10	---
To Materials	140	1,400	By Scrap	40	240
To Wages		2,000	By Warehouse	450	17,100
To Direct Expenses		1,340			
Total	500	17,340	Total	500	17,340

$$\begin{aligned}
 \text{Cost per Tonne} &= \frac{17,340 - 240}{500 - 10 - 40} \\
 &= \frac{17,100}{450} \\
 &= ₹ 38 \text{ per ton}
 \end{aligned}$$

10. Product A

As the question says that "Products B and C must be processed further before they can be sold", it means Product A can be sold at the split-off point.

Cost to process Product A after the split-off point = ₹ 6,00,000

Additional revenue to be earned by processing further = ₹ 3,00,000

(₹ 100 increase in selling price per unit x 3,000 units)

Therefore, Product A will not be processed further, and the sales value at split-off for A will be used for allocating the joint costs.

Sales value at the split-off for A = ₹ 6,00,000

(₹ 200 × 3,000 units)

Product B

Since Product B must be processed further, we use its net realizable value for the joint cost allocation.

Net realizable value of Product B = ₹ 15,00,000

[(₹ 350 × 6,000 units) – ₹ 6,00,000
further processing costs]

Product C

Product C, the by-product, must also be processed further to be sold.

Net realizable value of Product C = ₹ 3,00,000

[(₹ 100 × 9,000 units) – ₹ 6,00,000
in further processing costs]

Joint Cost Allocation

Joint production cost = ₹ 33,60,000

Since, by-product C is accounted for as a reduction to the joint costs, the joint costs to be allocated

$$= ₹ 30,60,000$$

$$(₹ 33,60,000 - ₹ 3,00,000 \text{ NRV of Product C})$$

Allocation of joint costs between Product A and B will be on the basis of ₹ 6,00,000: ₹ 15,00,000

$$\text{Joint Cost allocated to Product A} = ₹ 30,60,000 \times \frac{₹ 6,00,000}{₹ 21,00,000} = ₹ 8,74,286$$

11. **Operating Cost Sheet**

Particulars	Amount (₹)	Amount (₹)
<u>Standing Charges:</u>		
Depreciation (₹ 24,00,000 X 10% X 1/12 X 25)	5,00,000	
Garage Rent	1,00,000	
Insurance	25,000	
Road Tax	20,000	
Manager's Salary	60,000	
Assistant's Salary (₹ 32,000 X 2)	64,000	
Supervisor's Salary (₹ 24,000 X 3)	72,000	
Driver's Salary (₹ 20,000 X 25)	5,00,000	
Cleaner's Salary (₹ 5,000 X 20)	1,00,000	
Office Staff's Salary	1,00,000	
Consumables	1,20,000	
Repairs & Maintenance	90,000	
Other Fixed Expenses	<u>72,000</u>	18,23,000
<u>Running Charges</u>		
Diesel (49,600 Kms / 10 Kms X ₹ 80 per unit)	3,96,800	
Oils & Lubricants	1,45,000	
Tyres and tubes	<u>35,000</u>	<u>5,76,800</u>
Total Operating Cost		<u>23,99,800</u>

$$\begin{aligned} \text{Cost per passenger-km} &= \frac{\text{Total Operating Cost}}{\text{Passenger -kms}} \\ &= \frac{23,99,800}{27,18,080} \\ &= 0.883 \end{aligned}$$

Working Note:

Calculation of Total Kilometers and Passenger Kilometers

Specification	Total Km.	Passenger-Km.
12 Buses (60 Passengers)	29,760 Kms (10 Kms × 4 X 2 trips × 31 days × 12 Buses)	14,28,480 (29760 Kms x 60 Pass. x 80%)
13 Buses (50 Passengers)	32,240 Kms (10 Kms × 4 X 2 trips × 31 days × 13 Buses)	12,89,600 (32240 Kms x 50 Pass. x 80%)
Total	62,000	27,18,080

Since 5 buses out of 25 buses are kept for repairs every day

$$\text{Actual total Km.} = 62,000 \times 20/25 = 49,600$$

12. (i) **Direct Material Cost Variance** = Direct Material Price Variance + Direct Material Usage Variance

$$= ₹ 4,80,000 F + ₹ 48,000 F = ₹ 5,28,000 F$$

- (ii) **Budgeted Output (units)**

Fixed Production Overhead Expenditure Variance

$$= \text{Budgeted Fixed Overhead} - \text{Actual Fixed Overheads}$$

$$= \text{Budgeted Output} \times \text{Standard Overhead Rate} - \text{Actual Fixed Overheads}$$

$$₹ 1,80,000 A = \text{Budgeted Output} \times ₹ 360 \text{ (5 hrs @ ₹ 72)} - ₹ 45,00,000$$

$$\text{Budgeted Output} = \frac{₹ 45,00,000 - ₹ 1,80,000}{₹ 360} = 12,000 \text{ units}$$

- (iii) **Quantity of Materials purchased (in kilograms)**

Material Price Variance = Actual Usage (Standard Price per kg - Actual price per kg)

$$₹ 4,80,000 F = \text{Actual Usage} (₹ 24 - ₹ 22)$$

$$\text{Actual usage in kgs} = \frac{₹ 4,80,000 - ₹ 1,80,000}{₹ 2} = 2,40,000 \text{ kgs}$$

- (iv) **Actual Output (units)**

Actual Direct Wages	₹ 43,92,000
Direct labour rate variance	₹ 69,120 A

Direct labour efficiency variance	₹ 33,120 F
Standard labour cost for actual output	₹ 43,56,000

$$\begin{aligned} \text{Actual Output} &= \frac{\text{Standard labour cost for actual output}}{\text{Standard wage rate per unit}} \\ &= \frac{\text{₹ } 43,56,000}{\text{₹ } 360 (72 \times 5)} = \mathbf{12,100 \text{ units}} \end{aligned}$$

Alternatively, let X be the actual quantity of output

Then, Standard Quantity of input for actual output 'X'

$$20X = \text{SQ}$$

$$\begin{aligned} \text{Material cost variance} &= (\text{SQ} \times \text{SP}) - (\text{AQ} \times \text{AP}) \\ \text{₹ } 5,28,000 &= (20 X \times \text{₹ } 24) - (2,40,000 \text{ kgs} \times \text{₹ } 22) \\ 480X &= \text{₹ } 52,80,000 + \text{₹ } 5,28,000 \\ 480X &= \text{₹ } 58,08,000 \\ X &= \frac{\text{₹ } 58,08,000}{480} = \mathbf{12,100 \text{ units}} \end{aligned}$$

(v) Actual hours worked

$$\begin{aligned} \text{Labour Efficiency Variance} &= \text{Standard Labour Rate (Standard time for actual output - Actual time)} \\ \text{₹ } 33,120 \text{ F} &= \text{₹ } 72 (5 \text{ hours} \times 12100 \text{ units} - \text{Actual time}) \\ 460 \text{ hours} &= 60,500 \text{ hours} - \text{Actual time} \\ \text{Actual time} &= 60,500 - 460 = \mathbf{60,040 \text{ hours}} \end{aligned}$$

(vi) Actual wage rate per hour

$$\begin{aligned} \text{Actual Wages paid} &= \text{₹ } 43,92,000 \\ \text{Actual hours worked} &= 60,040 \text{ hours} \\ \text{Actual Wage rate per hour} &= \frac{\text{₹ } 43,92,000}{60,040 \text{ hours}} = \mathbf{\text{₹ } 73.15 \text{ per hour}} \end{aligned}$$

(vii) Labour cost variance

$$\begin{aligned} &= \text{Labour rate variance} + \text{Labour efficiency variance} \\ &= \text{₹ } 69,120 \text{ A} + \text{₹ } 33,120 \text{ F} \\ &= \mathbf{\text{₹ } 36,000 \text{ A}} \end{aligned}$$

(viii) Production Overhead Cost Variance

$$\begin{aligned}
 &= \text{Actual Output} \times \text{Standard overhead rate} - \text{Actual Overheads Incurred} \\
 &= 12,100 \text{ units} \times ₹ 360 - ₹ 45,00,000 \\
 &= ₹ 43,56,000 - ₹ 45,00,000 \\
 &= ₹ 1,44,000 \text{ A}
 \end{aligned}$$

13. (a) (i) Full cost of the product per unit

Direct material	₹ 693
Direct labour	₹ 315
Variable manufacturing support	₹ 504
Fixed manufacturing support	<u>₹ 1092</u>
Total manufacturing costs	<u>₹ 2604</u>

(ii) Contribution margin per unit

Selling price	₹ 3906
Less: Variable costs	
Direct material	₹ 693
Direct labour	₹ 315
Variable manufacturing support	<u>₹ 504</u>
Contribution margin per unit	<u>₹ 2394</u>

(iii) Costs for decision making are those costs that differ between alternatives, which in this situation are the incremental costs.

Direct material	₹ 693
Direct labour	₹ 315
Variable manufacturing support	<u>₹ 504</u>
Total incremental costs	<u>₹ 1512</u>

(iv) Minimum acceptable price would be the incremental costs in the short term i.e. ₹ 1512**(v) Yes, RPP Manufacturers may consider a price of ₹ 2100 per unit because this price is greater than the minimum acceptable price.**

(b) (i)

Particulars	(₹)
Variable cost per running hour of Machine MR10 (₹ 68,750/1100 hours)	62.50
Fixed cost (₹ 50,000/1100 hours)	45.46
Cost of brain scan on Machine MR10:	(₹)
Variable machine cost (4 hours × ₹ 62.50)	250.00
Special technology	100.00
Total variable cost	350.00
Fixed machine cost (4 hours × ₹ 45.46)	181.84
Total cost of a scan	531.84
Total cost of a satisfactory scan (₹ 531.84/0.9)	590.93

(ii) It is given that fixed cost will remain unchanged and thus they are not relevant for the decision. The relevant costs would be the incremental costs of an additional scan:

Machine MR10:	(₹)
Variable cost per scan	350.00
Variable cost per satisfactory scan (₹ 350/0.9)	388.89
Machine MR59:	(₹)
Variable machine cost per scan (₹ 1,60,000 / 2000 hours × 1.8 hours)	144.00
Special technology	137.50
Variable cost per scan	281.50
Variable cost per satisfactory scan (₹ 281.50/0.94)	299.47

The relevant costs per satisfactory scan are cheaper on Machine MR59 and therefore brain scans should be undertaken on said machine.

14. Maximum Capacity in a budget period

= 50 Employees × 9 Hrs. × 5 Days × 4 Weeks = 9,000 Hrs.

Budgeted Hours

= 40 Employees × 9 Hrs. × 5 Days × 4 Weeks = 7,200 Hrs.

Actual Hrs.

= 6,750 Hrs.

Standard Hrs. for Actual Output

= 7,875 Hrs.

Budget No. of Days

= 20 Days (4 Weeks x 5 Days)

Actual No. of Days

= 20 – 1 = 19 Days

$$(i) \text{ Efficiency Ratio} = \frac{\text{Standard Hrs}}{\text{Actual Hrs}} \times 100 = \frac{7,875 \text{ hours}}{6,750 \text{ hours}} \times 100 = 116.67\%$$

$$(ii) \text{ Activity Ratio} = \frac{\text{Standard Hrs}}{\text{Budgeted Hrs}} \times 100 = \frac{7,875 \text{ hours}}{7,200 \text{ hours}} \times 100 = 109.375\%$$

$$(iii) \text{ Calendar Ratio} = \frac{\text{Available working days}}{\text{Budgeted working days}} \times 100 = \frac{19 \text{ days}}{20 \text{ days}} \times 100 = 95\%$$

$$(iv) \text{ Standard Capacity Usage Ratio} = \frac{\text{Budgeted Hours}}{\text{Max. possible hours in the budgeted period}} \times 100$$

$$= \frac{7,200 \text{ hours}}{9,000 \text{ hours}} \times 100 = 80\%$$

$$(v) \text{ Actual Capacity Usage Ratio} = \frac{\text{Actual Hours worked}}{\text{Max. possible working hours in a period}} \times 100$$

$$= \frac{6,750 \text{ hours}}{9,000 \text{ hours}} \times 100 = 75\%$$

$$(vi) \text{ Actual Usage of Budgeted Capacity Ratio} = \frac{\text{Actual working Hours}}{\text{Budgeted Hours}} \times 100$$

$$= \frac{6,750 \text{ hours}}{7,200 \text{ hours}} \times 100 = 93.75\%$$

15. (a)

Item	Direct	Indirect	Fixed	Variable
Electronic monitoring	YES			YES
Meals for patients	YES			YES
Nurses' salaries		YES	YES	
Parking maintenance		YES	YES	
Security		YES	YES	

(b)

Cost Control	Cost Reduction
1. Cost control aims at maintaining the costs in accordance with the established standards.	1. Cost reduction is concerned with reducing costs. It challenges all standards and endeavours to improve them continuously
2. Cost control seeks to attain lowest possible cost under existing conditions.	2. Cost reduction recognises no condition as permanent, since a change will result in lower cost.
3. In case of cost control, emphasis is on past and present	3. In case of cost reduction, it is on present and future.
4. Cost control is a preventive function	4. Cost reduction is a corrective function. It operates even when an efficient cost control system exists.
5. Cost control ends when targets are achieved.	5. Cost reduction has no visible end and is a continuous process.

(c)

	Basis	Cost Accounting	Management Accounting
(i)	Nature	It records the quantitative aspect only.	It records both qualitative and quantitative aspect.
(ii)	Objective	It records the cost of producing a product and providing a service.	It provides information to management for planning and co-ordination.
(iii)	Area	It only deals with cost Ascertainment.	It is wider in scope as it includes financial accounting, budgeting, taxation, planning etc.
(iv)	Recording of data	It uses both past and present figures.	It is focused with the projection of figures for future.
(v)	Development	Its development is related to industrial revolution.	Its development is related to the need of modern business world.
(vi)	Rules and Regulation	It follows certain principles and procedures for recording costs of different products.	It does not follow any specific rules and regulations.

- (d) Cost units are usually the units of physical measurement like number, weight, area, volume, length, time and value.

Industry or Product	Cost Unit Basis
Automobile	Number
Steel	Ton
Cement	Ton/ per bag etc.
Chemicals	Litre, gallon, kilogram, ton etc.
Power	Kilo-watt hour (kWh)
Transport	Passenger- kilometer