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PAPER – 4:
COST AND MANAGEMENT ACCOUNTING

QUESTIONS

Division A: Case Scenario

Material Cost

1. 'Axe Trade', an unregistered supplier under GST, purchased material from Vye Ltd. which is registered supplier under GST. During the month of June 2024, the Axe Traders has purchased a lot of 5,000 units on credit from Vye Ltd. The information related to the purchase are as follows:

Listed price of one lot of 5,000 units	- ₹ 2,50,000
Trade discount	- @ 10% on listed price
CGST and SGST (Credit available)	- 18% (9% CGST + 9% SGST)
Cash discount	- @ 10%

(Will be given only if payment is made within 30 days.)

Toll Tax paid	₹ 5,000
Freight and Insurance	₹ 17,220
Demurrage paid to transporter	₹ 5,000
Commission and brokerage on purchases	₹ 10,000
Amount deposited for returnable containers	₹ 30,000
Amount of refund on returning the container	₹ 20,000
Other Expenses	@ 2% of total cost

A 20% shortage in material on receipt is expected considering the nature of the raw material.

The payment to the supplier was made within 21 days of the purchases.

(i) If Axe Traders pays the supplier within 30 days of purchase, then, what is the total amount of cash discount received from the supplier and how it is treated to calculate material cost?

(a) ₹ 25,000 & it will not be deducted from the material cost

(b) ₹ 26,550 & it will be deducted from the material cost

(c) ₹ 26,550 & it will not be deducted from the material cost

(d) ₹ 22,500 & it will not be deducted from the material cost

(ii) What will be the amount of other expenses and how it is treated in material cost?

(a) ₹ 6,154.40 & it will be added with the material cost

(b) ₹ 6,280.00 & it will be added with the material cost

(c) ₹ 5,344.40 & it will be added with the material cost

(d) ₹ 5,453.47 & it will not be added with the material cost

(iii) What is the amount of GST and how will it be treated in cost sheet of Axe Traders?

(a) ₹ 40,500 & it will not be added with material cost

(b) ₹ 40,500 & it will be added with material cost

(c) ₹ 45,000 & it will not be added with material cost

(d) ₹ 45,000 & it will be added with material cost

(iv) What is the total material cost chargeable in the cost sheet of Axe Traders?

(a) ₹ 3,14,000

(b) ₹ 2,73,500

(c) ₹ 2,72,673

(d) ₹ 3,13,874

(v) The number of good units and cost per unit of the materials received are:

(a) 5,000 units & ₹ 62.80

(b) 5,000 units & ₹ 54.70

(c) 4,000 units & ₹ 78.50

(d) 4,000 units & ₹ 68.38

Standard Costing

2. ABC Pvt Ltd is engaged in the manufacture of a Product Q. The product has the following standard production requirements determined by the technical team of the company post satisfactory completion of test run.

Raw Material Z – 2 units @ ₹ 2 per unit

Skilled labour of – 2.5 hours@ ₹ 5 per hour

Fixed Overheads – ₹ 7.5 per unit

The input of Raw material Z has a yield of 80% everytime when infused into production. The actual quantity of Raw material Z consumed for production during the year was 24,000 units. The Usage variance of Material Z was 2,000 Favourable. Further the actual amount of material cost for the material consumed amounted to ₹ 45,000.

During the said year, the actual working hours were 30,000 for which the labour cost paid by the company amounted to ₹1,20,000. The idle time variance amounted to 10,000 Adverse.

The actual fixed overheads incurred for the year amounted to ₹ 1,50,000 and the expenditure variance was ₹25,000 Favourable.

In the context of the above, the following needs to be determined:

(i) The Actual output of Product Q produced during the year is:

(a) 10,000 units

(b) 12,500 units

(c) 25,000 units

(d) 15,000 units

(ii) The Material price and material cost variance are:

(a) Price variance – 3,000 Adverse, Cost Variance – 5,000 Adverse

(b) Price variance – 3,000 Favourable, Cost Variance – 5,000 Favourable

(c) Price variance – 3,000 Favourable, Cost Variance – 8,000 Adverse

(d) Price variance – 5,000 Adverse, Cost Variance – 3,000 Favourable

(iii) The Standard Hours, Net Actual hours and the idle time are:

(a) Standard Hours – 27,500 Net Actual Hours – 28,000 hours Idle Time – 2,000 hours

(b) Standard Hours – 22,500 Net Actual Hours – 28,500 hours Idle Time – 1,500 hours

(c) Standard Hours – 24,000 Net Actual Hours – 29,000 hours Idle Time – 1,000 hours

(d) Standard Hours – 25,000 hours Net Actual Hours –28,000 hours Idle Time – 2,000 hours

(iv) Labour Efficiency variance and Labour rate variance are:

(a) Labour Efficiency Variance – 30,000 Favourable Labour rate Variance – 25,000 Adverse

(b) Labour Efficiency Variance – 25,000 Favourable, Labour rate Variance – 30,000 Adverse

(c) Labour Efficiency Variance – 25,000 Adverse, Labour rate Variance – 30,000 Favourable

(d) Labour Efficiency Variance – 30,000 Adverse Labour rate Variance – 25,000 Favourable

(v) Fixed Overhead volume variance is:

(a) Fixed Overhead volume variance – 1,00,000 Favourable

(b) Fixed Overhead volume variance – 50,000 Adverse

(c) Fixed Overhead volume variance – 1,00,000 Adverse

(d) Fixed Overhead volume variance – 50,000 Favourable

Overheads: Absorption Costing Method

3. The accountant for Brilliant Tools Ltd applies overhead based on machine hours. The budgeted overhead and machine hours for the year are ₹ 1,30,000 and 8,000 hours, respectively. The actual overhead and machine hours incurred were ₹ 1,37,500 and 10,000 hours. The cost of goods sold and inventory data compiled for the year is as follows:

Direct Material ₹ 25,000

Cost of Goods Sold ₹ 2,25,000

Units: WIP 50,000 and Finished Goods 75,000

What is the amount of over/under absorbed overhead for the year?

(a) Over absorbed by ₹ 25,000

(b) Under absorbed by ₹ 25,000

(c) Over a absorbed by ₹ 32,500

(d) Under absorbed by ₹ 32,500

Process Costing

4. The following information is available in respect of Process I: Raw material purchased and introduced 10,000 units @ 5 per unit Raw Material received from store 4000 units @ 6 per unit Direct Labour 40,000 Overheads 28,000 Output of Process is 13,500 units, Normal wastage 5% of inputs Scrap value of wastage 4 per unit The value of Abnormal Gain is:

(a) ₹ 2062.68

(b) ₹ 2135.34

(c) ₹ 2103.70

(d) ₹ 2093.2

Service Costing

5. A hotel has 200 rooms (120 Deluxe rooms and 80 Premium rooms). The normal occupancy in summer is 80% and winter 60%. The period of summer and winter is taken as 8 months and 4 months respectively. Assume 30 days in each month. Room rent of Premium room will be double of Deluxe room. Hotel is expecting a profit of 20% on total revenue, total cost for the year is 2,66,11,200. Calculate the room rent to be charged for Premium room.

   (a) ₹ 450 per room day

   (b) ₹ 900 per room day

   (c) ₹ 380 per room day

   (d) ₹ 760 per room day

6. ALC Ltd. is a insurance company. It launched a new term insurance policy Names as Protection Plus. The total cost for the policy during the year is ₹ 1,60,00,000. Total number of policies sold is 410 and total insured value of policies is ₹ 920 crore.

   What is the cost per rupee of insured value?

   (a) ₹ 0.0017

   (b) ₹ 0.18

   (c) ₹ 575

   (d) ₹ 2.24

Budget and Budgetary Control

7. A business manufactures a single product and is preparing its production budget for the year ahead. It is estimated that 2,00,000 units of the product can be sold in the year and the opening inventory is currently 25,000 units. The inventory level is to be reduced by 40% by the end of the year. What is production budget in units?

   (a) 1,95,000 units

   (b) 1,90,000 units

   (c) 1,84,000 units

(d) 1,75,000 units

Employee Cost

8. The labour turnover rates for the quarter ended 30th June, 2024 are computed as 14%, 8% and 6% under Flux method, Replacement method and Separation method respectively. If the number of workers replaced during 1st quarter of the financial year 2024-25 is 36, COMPUTE the following:

(i) The number of workers recruited and joined; and

(ii) The number of workers left and discharged.

Overheads: Absorption Costing Method

9. From the details furnished below you are required to compute a comprehensive machine-hour rate:

Original purchase price of the machine (subject to depreciation at 10% per annum on original cost)	₹ 12,96,000
Normal working hours for the month (The machine works for only 75% of normal capacity)	200 hours
Wages to Machine-man	₹ 800 per day (of 8 hours)
Wages to Helper (machine attendant)	₹ 500 per day (of 8 hours)
Power cost for the month for the time worked	₹ 1,30,000
Supervision charges apportioned for the machine centre for the month	₹ 18,000
Electricity & Lighting (fixed in nature) for the month	₹ 9,500
Repairs & maintenance (machine) including consumable stores per month	₹ 17,500
Insurance of Plant & Building (apportioned) for the year	₹ 18,000
Other general expense per annum	₹ 18,000

The workers are paid a fixed dearness allowance of ₹ 4,500 per month. Production bonus payable to workers in terms of an award is equal to 10% of basic wages and dearness allowance. Add 10% of the basic wage and dearness allowance against leave wages and holidays with pay to arrive at a comprehensive labour-wage for debit to production.

Activity Based Costing

10. SOFTHUG is a global brand created by Green-lush Ltd. The company manufactures three range of beauty soaps i.e. SOFTHUG- Gold, SOFTHUG- Pearl, and SOFTHUG- Diamond. The budgeted costs and production for the month of May, 2024 are as follows:

	SOFTHUG- Gold		**SOFTHUG- Pearl**		**SOFTHUG- 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

Green-lush 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, Green-lush 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
Utility cost	80,000	Number of Machine operations

The number of machine operators per unit of production are 5, 5, and 6 for SOFTHUG- Gold, SOFTHUG- Pearl, and SOFTHUG- 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 required to:

(i) PREPARE a statement showing the unit costs and total costs of each product using the absorption costing method.

(ii) 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?

Cost Sheet

11. From the following data of Appu Ltd., CALCULATE (i) Material Consumed; (ii) Prime Cost and (iii) Cost of production.

		Amount (₹)
(i)	Repair & maintenance paid for plant & machinery	9,80,500
(ii)	Insurance premium paid for inventories	26,000
(iii)	Insurance premium paid for plant & machinery	96,000
(iv)	Raw materials purchased	64,00,000
(v)	Opening stock of raw materials	2,88,000
(vi)	Closing stock of raw materials	4,46,000
(vii)	Wages paid	23,20,000
(viii)	Value of opening Work-in-process	4,06,000
(ix)	Value of closing Work-in-process	6,02,100

(x)	Quality control cost for the products in manufacturing process	86,000
(xi)	Research & development cost for improvement in production process	92,600
(xii)	Administrative cost for:	
	- Factory & production	9,00,000
	- Others	11,60,000
(xiii)	Amount realised by selling scrap generated during the manufacturing process	9,200
(xiv)	Packing cost necessary to preserve the goods for further processing	10,200
(xv)	Salary paid to Director (Technical)	8,90,000

Cost Accounting System

12. A manufacturing company disclosed a net loss of ₹ 3,47,000 as per their cost accounts for the year ended March 31,2024. The financial accounts however disclosed a net loss of ₹ 5,10,000 for the same period. The following information was revealed as a result of scrutiny of the figures of both the sets of accounts.

	(₹)
(i) Factory Overheads under-absorbed	40,000
(ii) Administration Overheads over-absorbed	60,000
(iii) Depreciation charged in Financial Accounts	3,25,000
(iv) Depreciation charged in Cost Accounts	2,75,000
(v) Interest on investments not included in Cost Accounts	96,000
(vi) Income-tax provided	54,000
(vii) Interest on loan funds in Financial Accounts	2,45,000
(viii) Transfer fees (credit in financial books)	24,000
(ix) Stores adjustment (credit in financial books)	14,000
(x) Dividend received	32,000

PREPARE a memorandum Reconciliation Account

Batch Costing

13. A jobbing factory has undertaken to supply 300 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 ₹ 8 per piece. From the following data CALCULATE the cost and profit per piece of each batch order and overall position of the order for 1,800 pieces.

Month	Batch Output	Material cost (₹)	Direct wages (₹)	Direct labour hours
January	310	1150	120	240
February	300	1140	140	280
March	320	1180	150	280
April	280	1130	140	270
May	300	1200	150	300
June	320	1220	160	320

The other details are:

Month	Chargeable expenses (₹)	Direct labour (Hours)
January	12,000	4,800
February	10,560	4,400
March	12,000	5,000
April	10,580	4,600
May	13,000	5,000
June	12,000	4,800

Process Costing

14. The following data are available in respect of Process-I for June 2024:

(1) Opening stock of work in process: 600 units at a total cost of ₹ 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 ₹ 55,20,000 for 9,200 units.

(4) Direct wages incurred ₹ 18,60,000

(5) Production overhead ₹ 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 ₹ 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.

Joint Products & By-Products

15. 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 ₹ 5 for X; ₹ 4 for Y; and ₹ 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 ₹ 13.75 ₹ 8.75 and ₹ 7.50 and ₹ 1.00 respectively – all per unit quantity sold.

During a period, the joint input cost including the material cost was ₹ 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.

Service Costing

16. BK Infra Ltd. built and operates a 110 k.m. long highway on the basis of Built-Operate-Transfer (BOT) model for a period of 25 year. A traffic assessment has been carried out to estimate the traffic flow per day. The details are as below:

Sl. No.	Type of vehicle	Daily traffic volume
1.	Two wheelers	44,500
2.	Car and SUVs	3,450
3.	Bus and LCV	1,800
4.	Heavy commercial vehicles	816

The following is the estimated cost of the project:

Sl. No.	Activities	Amount (₹ in lakh)
1	Site clearance	170.70
2	Land development and filling work	9,080.35
3	Sub base and base courses	10,260.70
4	Bituminous work	35,070.80
5	Bridge, flyovers, underpasses, Pedestrian subway, footbridge, etc.	29,055.60
6	Drainage and protection work	9,040.50
7	Traffic sign, marking and road appurtenance	8,405.00
8	Maintenance, repairing and rehabilitation	12,429.60
9	Environmental management	982.00
	Total Project cost	114,495.25

An average cost of ₹ 1,120 lakh has to be incurred on administration and toll plaza operation.

On the basis of the vehicle specifications (i.e. weight, size, time saving etc.), the following weights has been assigned to the passing vehicles:

Sl. No.	Type of vehicle	
1.	Two wheelers	5%
2.	Car and SUVs	20%
3.	Bus and LCV	30%
4.	Heavy commercial vehicles	45%

Required:

(i) CALCULATE the total project cost per day of concession period.

(ii) COMPUTE toll fee to be charged for per vehicle of each type, if the company wants to earn a profit of 15% on total cost.

[Note: Concession period is a period for which an infrastructure is allowed to operate and recovers its investment]

Marginal Costing

17. RS Ltd. manufactures and sells a single product X whose selling price is ₹ 100 per unit and the variable cost is ₹ 60 per unit.

    (i) If the Fixed Costs for this year are ₹ 24,00,000 and the annual sales are at 60% margin of safety, CALCULATE the rate of net return on sales, assuming an income tax level of 40%

    (ii) For the next year, it is proposed to add another product line Y whose selling price would be ₹ 150 per unit and the variable cost ₹ 100 per unit. The total fixed costs are estimated at ₹ 28,00,000. The sales mix of X : Y would be 5 : 3. COMPUTE the break-even sales in units for both the products.

Budget and Budgetary Control

18. Raja Ltd manufactures and sells a single product and has estimated sales revenue of ₹ 302.4 lakh during the year based on 20% profit on selling price. Each unit of product requires 6 kg of material A and 3 kg of material B and processing time of 4 hours in machine shop and 2 hours in assembly shop. Factory overheads are absorbed at a blanket rate of 20% of direct labour. Variable selling & distribution overheads are ₹ 60 per unit sold and fixed selling & distribution overheads are estimated to be ₹ 69,12,000.

    The other relevant details are as under:

Purchase Price:	Material A	₹ 160 per kg
	Materials B	₹ 100 per kg
Labour Rate:	Machine Shop	₹ 140 per hour
	Assembly Shop	₹ 70 per hour

	Finished Stock	Material A	Material B
Opening Stock	2,500 units	7,500 kg	4,000 kg
Closing Stock	3,000 units	8,000 kg	5,500 kg

Required

(i) CALCULATE number of units of product proposed to be sold and selling price per unit,

(ii) PREPARE Production Budget in units and

(iii) PREPARE Material Purchase Budget in units.

Miscellaneous

19. (a) DISCUSS the Net Realisable Value (NRV) method of apportioning joint costs to by-products.

(b) DIFFERENTIATE between Service costing and Product costing.

(c) DISCUSS the Controllable and un-controllable variances.

(d) DISCUSS the Standard and Discretionary Cost Centres.

SUGGESTED ANSWERS/HINTS

1. (i) (d) Cash discount is received when credit amount is paid within the stipulated period of 30 days. The amount of cash discount to be received from the supplier is:

	Particulars	**Amount (₹)**
A.	Listed price	2,50,000
B.	Less: Trade Discount @10%	(25,000)
C.	Taxable value (A-B)	2.25,000
D.	Add: GST@18% (18% of C)	40,500
E.	Total amount payable to the supplier	2,65,500
F.	Cash discount @10% (10% of C)	**(22,500)**
G.	Net amount to be paid to the supplier (E-F)	2,43,000

(ii) (b)

Particulars	Units	(₹)
Listed Price of Materials	5,000	2,50,000
Less: Trade discount @ 10% on invoice price		(25,000)
		2,25,000
Add: GST @ 18% of ₹ 2,25,000		40,500
		2,65,500
Add: Toll Tax		5,000
Freight and Insurance		17,220
Commission and Brokerage Paid		10,000
Add: Cost of returnable containers:		
Amount deposited ₹ 30,000		
Less: Amount refunded ₹ 20,000		10,000
		3,07,720
Add: Other Expenses @ 2% of Total Cost $\left(\frac{₹\ 3,07,720}{98} \times 2\right)$		6,280
Total cost of material		3,14,000
Less: Shortage material due to normal reasons @ 20%	1,000	-
Total cost of material of good units	4,000	3,14,000
Cost per unit (₹ 3,14,000/4,000 units)		78.5

(iii) (b) Axe Traders is an unregistered supplier in the GST; thus, GST credit is not applicable for it. GST paid on the purchase of the material will be the part of the material cost.

(iv) (a) Please refer the solution above

(v) (c) Please refer the solution above

2. **(i)** **(a)** 10,000 units

Usage variance of Material Z = 2,000 F

Usage Variance = SQ x SP – AQ x SP

SP = ₹ 2

AQ = 24,000 units

2 x (SQ – 24,000) = 2,000

2SQ = 50,000

Therefore SQ = 25,000

No of units of Input required per output = 2

Yield of input = 80%

= (25000/2) x 80% = 10,000 units.

(ii) **(b)** Price variance – 3,000 Favourable,

Cost Variance – 5,000 Favourable

Price variance = AQ x (SP-AP)

24,000 x (2-1.875) = 3,000 Favourable.

Cost variance = SQ x SP – AQ x AP

= 50,000–45,000=5,000 Favourable.

(iii) **(d)** Standard Hours – 25,000 hours Net Actual Hours –28,000 hours
Idle Time – 2,000 hours

Actual output = 10,000 units

Standard hours per unit = 2.5

Therefore standard hours = 10,000 x 2.5 = 25,000 hours.

Idle time variance = SR x (Net AH – AH)

5 x (Net AH – 30,000) = 10,000 Adverse

5 Net AH – 1,50,000 = -10,000

5 Net AH = 1,40,000

		Net AH	= 28,000 hours
		Idle time	= 2,000 hours
(iv)	**(c)**	Labour Efficiency Variance	– 25,000 Adverse,
		Labour rate Variance	– 30,000 Favourable
		Efficiency Variance	= SR x (SH-AH)
			= 5 x (25,000 – 30,000)
			= 25,000 Adverse
		Rate Variance	= AH x (SR – AR)
			= 30,000 (5 – 4) [1,20,000/30,000]
			= 30,000 Favourable.
(v)	**(c)**	Fixed Overhead Volume variance – 1,00,000 Adverse	
		Overhead Volume variance	= Actual OutputxSR per unit – Budgeted FOH
		Budgeted FOH	= Actual FOH (+/-) Expenditure variance
		1,50,000 + 25,000	= 1,75,000
		AO x SR	= 10,000 x 7.5 = 75,000
		Therefore volume variance	= 75,000 – 1,75,000
			=1,00,000 Adverse.

3. **(a)** Overabsorbed by ₹ 25,000

Predetermined Overhead Rate = Budgeted Overhead / Budgeted hours i.e. 130,000 / 8,000 = ₹ 16.25 per hour.

Hence, absorbed overhead = 10,000 X 16.25 = ₹ 1,62,500.

Since actual overhead incurred were ₹ 1,37,500

Hence the overhead were over absorbed by 1,62,500 – 1,37,500 = ₹ 25,000.

4. (d) ₹ 2093.2

Process a/c

Particulars	Units	Amount	Particulars	units	Amount
Raw material	10,000	50,000	Normal loss	700	2,800
Stores	4,000	24,000	Units transferred	13,500	1,41,293.2
Direct Wages		40,000			
Production overheads		28,000			
Abnormal gain	200	2,093.2			
		1,44,093.2			1,44,093.2

Cost per unit= $\frac{1,42,000-2,800}{14,000-700}$ = 10.466 per unit

5. (b) ₹ 900 per room day

Total Revenue (2,66,11,200/80%) = 3,32,64,000

Calculation of Room Days:

	Deluxe	Premium
Summer	120 rooms x 80% x 30 days x 8 months = 23,040	80 rooms x 80% x 30 days x 8 months = 15,360
Winter	120 rooms x 60% x 30 days x 4 months = 8,640	80 rooms x 60% x 30 days x 4 months = 5,760
Total room days	31,680	21,120

Let's assume the room rent of Deluxe room be 'x'

Then rent of Premium room will be '2x'

Therefore: 31,680x + 42,240x = 3,32,64,000

X = 450

Rent of Premium room will be 450 x 2 = ₹ 900 per room day

6. **(a)** ₹ 0.0017

Cost per rupee of insured value

= Total Cost/ Total Insured Value

= 1.6 cr/920 cr = ₹ 0.0017

7. **(b)** 1,90,000 units

	Units
Sales budget	2,00,000
Add: Closing Inventory (25,000 x 0.6)	15,000
Less: Opening Inventory	(25,000)
Production Budget	1,90,000

8. Labour Turnover Rate (Replacement method) $= \frac{\text{No. of workers replaced}}{\text{Average No. of workers}}$

Or, $\frac{8}{100} = \frac{36}{\text{Average No. of workers}}$

Or, Average No. of workers = 450

Labour Turnover Rate (Separation method) $= \frac{\text{No. of workers separated}}{\text{Average No. of workers}}$

Or, $\frac{6}{100} = \frac{\text{No. of workers separated}}{450}$

Or, No. of workers separated = 27

Labour Turnover Rate (Flux Method) $= \frac{\text{No. of Separations} + \text{No. of accession (Joinings)}}{\text{Average No. of workers}}$

Or, $\frac{14}{100} = \frac{27 + \text{No. of accessions (Joinings)}}{450}$

Or, 100 (27 + No. of Accessions) = 6,300

Or, No. of Accessions = 36

(i) The No. of workers recruited and Joined = 36

(ii) The No. of workers left and discharged = 27

9. Effective machine hours = 200 hours × 75% = 150 hours

Computation of Comprehensive Machine Hour Rate

	Per month (₹)	**Per hour (₹)**
Fixed cost		
Supervision charges	18,000.00	
Electricity and lighting	9,500.00	
Insurance of Plant and building (₹ 18,000 ÷12)	1,500.00	
Other General Expenses (₹ 18,000÷12)	1,500.00	
Depreciation (₹ 1,29,600÷12)	10,800.00	
	41,300.00	275.33
Direct Cost		
Repairs and maintenance	17,500.00	116.67
Power	1,30,000.00	866.67
Wages of machine man		196.00
Wages of Helper		136.00
Machine Hour rate (Comprehensive)		**1,590.67**

Wages per machine hour

	Machine man	**Helper**
Wages for 200 hours		
Machine-man (₹ 800 × 25)	₹ 20,000.00	---
Helper (₹ 500 × 25)	---	₹ 12,500.00
Dearness Allowance (DA)	₹ 4,500.00	₹ 4,500.00
	₹ 24,500.00	₹ 17,000.00

Production bonus (10% of Basic and DA)	2,450.00	1,700.00
Leave wages (10% of Basic and DA)	2,450.00	1,700.00
	29,400.00	20,400.00
Effective wage rate per machine hour	**196.00**	**136.00**

10. (i) Traditional Absorption Costing

	SOFTHUG-Gold	SOFTHUG - Pearl	SOFTHUG - 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 (a × b)/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:

	SOFTHUG-Gold (₹)	SOFTHUG-Pearl (₹)	SOFTHUG-Diamond (₹)
Direct Costs:			
- Direct Labour	5.00 $\left(\frac{10\times30}{60}\right)$	6.67 $\left(\frac{10\times40}{60}\right)$	10.00 $\left(\frac{10\times60}{60}\right)$
- Direct Material (Refer working note 1)	167.50	215.50	248.50

Production Overhead:	16.50 $\left(\frac{33\times30}{60}\right)$	22.00 $\left(\frac{33\times40}{60}\right)$	33.00 $\left(\frac{33\times60}{60}\right)$
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

	SOFTHUG - Gold (₹)	SOFTHUG - Pearl (₹)	SOFTHUG - Diamond (₹)
Essential oils	120.00 $\left(\frac{200\times60}{100}\right)$	165.00 $\left(\frac{300\times55}{100}\right)$	195.00 $\left(\frac{300\times65}{100}\right)$
Cocoa Butter	40.00 $\left(\frac{200\times20}{100}\right)$	40.00 $\left(\frac{200\times20}{100}\right)$	40.00 $\left(\frac{200\times20}{100}\right)$
Filtered water	4.50 $\left(\frac{15\times30}{100}\right)$	4.50 $\left(\frac{15\times30}{100}\right)$	4.50 $\left(\frac{15\times30}{100}\right)$
Chemicals	3.00 $\left(\frac{30\times10}{100}\right)$	6.00 $\left(\frac{50\times12}{100}\right)$	9.00 $\left(\frac{60\times15}{100}\right)$
Total costs	**167.50**	**215.50**	**248.50**

(ii) Activity Based Costing

	SOFTHUG-Gold	SOFTHUG-Pearl	SOFTHUG-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 (grams)	4,32,000	3,18,000	2,34,000	9,84,000
Direct labour (minutes)	30	40	60	-
Direct labour hours	2,000 $\left(\frac{4,000\times30}{60}\right)$	2,000 $\left(\frac{3,000\times40}{60}\right)$	2,000 $\left(\frac{2,000\times60}{60}\right)$	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 ÷ 9,84,000 grams = ₹ 0.06 per gram

Supervising rate per direct labour hour = ₹ 60,000 ÷ 6,000 hours = ₹ 10 per labour hour

Utilities rate per machine operations = ₹ 80,000 ÷ 47,000 machine operations

= ₹ 1.70 per machine operations

Unit Costs under ABC:

	SOFTHUG - Gold (₹)	**SOFTHUG - Pearl (₹)**	**SOFTHUG - Diamond (₹)**
Direct Costs:			
- Direct Labour	5.00	6.67	10.00
- Direct material	167.50	215.50	248.50
Production Overheads:			
Forklifting cost	6.48 (0.06 × 108)	6.36 (0.06 × 106)	7.02 (0.06 × 117)

Supervising cost	5.00 $\left(\frac{10\times30}{60}\right)$	6.67 $\left(\frac{10\times40}{60}\right)$	10.00 $\left(\frac{10\times60}{60}\right)$
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.

11. Calculation of Cost of Production of Appu Ltd.

Particulars	**Amount (₹)**
Raw materials purchased	64,00,000
Add: Opening stock	2,88,000
Less: Closing stock	(4,46,000)
Material consumed	62,42,000
Wages paid	23,20,000
Prime cost	85,62,000
Repair and maintenance cost of plant & machinery	9,80,500
Insurance premium paid for inventories	26,000
Insurance premium paid for plant & machinery	96,000
Quality control cost	86,000
Research & development cost	92,600
Administrative overheads related with factory and production	9,00,000
	1,07,43,100

Add: Opening value of W-I-P	4,06,000
Less: Closing value of W-I-P	(6,02,100)
	1,05,47,000
Less: Amount realised by selling scrap	(9,200)
Add: Primary packing cost	10,200
Cost of Production	1,05,48,000

Notes:

(i) Other administrative overhead does not form part of cost of production.

(ii) Salary paid to Director (Technical) is an administrative cost.

12. Memorandum Reconciliation Accounts

Dr. Cr.

	(₹)		(₹)
To Net Loss as per Costing books	3,47,000	By Administration overheads over recovered in cost accounts	60,000
To Factory overheads under absorbed in Cost Accounts	40,000	By Interest on investment not included in Cost Accounts	96,000
To Depreciation under charged in Cost Accounts	50,000	By Transfer fees in financial books	24,000
To Income-Tax not provided in Cost Accounts	54,000	By Stores adjustment (Credit in financial books)	14,000
To Interest on Loan Funds in Financial Accounts	2,45,000	By Dividend received in financial books	32,000
		By Net loss as per financial books	5,10,000
	7,36,000		7,36,000

13. Statement of Cost and Profit per batch

Particulars	Jan.	Feb.	March	April	May	June	Total
Batch output (in units)	310	300	320	280	300	320	1,830
Sale value (₹)	2,480	2,400	2,560	2,240	2,400	2,560	14,640
Material cost (₹)	1,150	1,140	1,180	1,130	1,200	1,220	7,020
Direct wages (₹)	120	140	150	140	150	160	860
Chargeable expenses* (₹)	600	672	672	621	780	800	4,145
Total cost (₹)	1,870	1,952	2,002	1,891	2,130	2,180	12,025
Profit per batch (₹)	610	448	558	349	270	380	2,615
Total cost per unit (₹)	6.03	6.51	6.26	6.75	7.10	6.81	6.57
Profit per unit (₹)	1.97	1.49	1.74	1.25	0.90	1.19	1.43

Overall position of the order for 1,800 units

Sales value of 1,800 units @ ₹ 8 per unit	₹ 14,400
Total cost of 1,800 units @ ₹ 6.57 per unit	₹ 11,826
Profit	₹ 2,574

$$* \frac{\text{Chargeable expenses}}{\text{Direct labour hour for the month}} \times \text{Direct labour hours for batch}$$

14. (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	**(₹)**	**Cost (₹)**	**Equivalent units (EU)**	**Cost per EU (₹)**
Material Cost	55,20,000			
Less: Scrap realisation 392 units @ ₹ 60/- p.u.	(23,520)	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

	(₹)	**(₹)**
Material cost of 192 units @ ₹ 624.03 p.u.	1,19,813.76	
Labour cost of 192 units @ ₹ 210.45 p.u.	40,406.40	
Production OH cost of 192 units @ ₹ 97.65 p.u.	18,748.80	1,78,968.96
Cost of closing WIP – 700 Units		
Material cost of 700 equivalent units @ ₹ 624.03 p.u.	4,36,821.00	
Labour cost of 490 equivalent units @ ₹ 210.45 p.u.	1,03,120.50	
Production OH cost of 490 equivalent @ ₹ 97.65 p.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 @ ₹ 210.45 p.u.	50,508.00
	Production OH cost 240 equivalent units @ ₹ 97.65 p.u.	23,436.00
		4,93,944.00
(iii)	Cost of 8,300 completed units	
	8,300 units @ ₹ 932.13 p.u.	77,36,679.00
	Total cost [(i) + (ii) + (iii))]	86,50,623.00

15. Working Notes:

(i) Computation of Allocation Ratio for Joint Costs

	Products		
	X ₹	Y ₹	Z. ₹
Selling Price	13.75	8.75	7.50
Less: anticipated margin@ 25% on cost of 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

	₹	₹
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 ₹	Output (units) ₹	Joint cost per unit ₹
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 ₹	Post spilt-off cost ₹	Total Cost ₹	Selling Price ₹	Margin ₹	Margin % on cost ₹
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

$$\mathbf{X} = \frac{24}{40} \times 90{,}000 = \mathbf{54{,}000}$$

$$Y = \frac{9}{40} \times 90{,}000 = 20{,}250$$

$$Z = \frac{7}{40} \times 90{,}000 = \underline{15{,}750}$$
$$\underline{90{,}000}$$

16. (i) Calculation of total project cost per day of concession period:

Activities	**Amount (₹ in lakh)**
Site clearance	170.70
Land development and filling work	9,080.35
Sub base and base courses	10,260.70
Bituminous work	35,070.80
Bridge, flyovers, underpasses, Pedestrian subway, footbridge, etc.	29,055.60
Drainage and protection work	9,040.50
Traffic sign, marking and road appurtenance	8,405.00
Maintenance, repairing and rehabilitation	12,429.60
Environmental management	982.00
Total Project cost	**114,495.25**
Administration and toll plaza operation cost	1,120.00
Total Cost	115,615.25
Concession period in days (25 years × 365 days)	9,125
Cost per day of concession period (₹ in lakh)	**12.67**

(ii) Computation of toll fee:

Cost to be recovered per day = Cost per day of concession period + 15% profit on cost

= ₹ 12,67,000 + ₹ 1,90,050

= ₹ 14,57,050

$$\text{Cost per equivalent vehicle} = \frac{₹\,14{,}57{,}050}{76{,}444\,\text{units (Refer working note)}}$$

= ₹ 19.06 per equivalent vehicle

Vehicle type-wise toll fee:

Sl. No.	Type of vehicle	Equivalent cost [A]	Weight [B]	Toll fee per vehicle [A×B]
1.	Two wheelers	₹ 19.06	1	19.06
2.	Car and SUVs	₹ 19.06	4	76.24
3.	Bus and LCV	₹ 19.06	6	114.36
4.	Heavy commercial vehicles	₹ 19.06	9	171.54

Working Note:

The cost per day has to be recovered from the daily traffic. Each type of vehicle is to be converted into equivalent unit. Let's convert all vehicle types equivalent to Two-wheeler

Sl. No.	Type of vehicle	Daily traffic volume [A]	Weight	Ratio [B]	Equivalent Two-wheeler [A×B]
1.	Two wheelers	44,500	0.05	1	44,500
2.	Car and SUVs	3,450	0.20	4	13,800
3.	Bus and LCV	1,800	0.30	6	10,800
4.	Heavy commercial vehicles	816	0.45	9	7,344
	Total				76,444

17. (i) Contribution per unit = Selling price – Variable cost

= ₹ 100 – ₹ 60

= ₹ 40

Break-even Point = $\frac{₹\ 24,00,000}{₹\ 40}$

= 60,000 units

Percentage Margin of Safety = $\frac{\text{Actual Sales} - \text{Break - even Sales}}{\text{Actual Sales}}$

Or, 60% = $\frac{\text{Actual Sales} - 60,000 \text{ units}}{\text{Actual Sales}}$

∴ Actual Sales = 1,50,000 units

	(₹)
Sales Value (1,50,000 units × ₹ 100)	1,50,00,000
Less: Variable Cost (1,50,000 units × ₹ 60)	(90,00,000)
Contribution	60,00,000
Less: Fixed Cost	(24,00,000)
Profit	36,00,000
Less: Income Tax @ 40%	(14,40,000)
Net Return	21,60,000

Rate of Net Return on Sales = 14.40% $\left(\frac{₹\,21,60,000}{₹\,1,50,00,000} \times 100\right)$

(ii) Products

	X (₹)	Y (₹)
Selling Price *per unit*	100	150
Variable Cost *per unit*	60	100
Contribution *per unit*	40	50

Composite contribution will be as follows:

Contribution per unit = $\left(\frac{40}{8} \times 5\right) + \left(\frac{50}{8} \times 3\right)$

= 25 + 18.75 = ₹ 43.75

Break-even Sale = 64,000 units $\left(\frac{₹28,00,000}{₹43.75}\right)$

Break-even Sales Mix:

X (64,000 units × 5/8) = 40,000 units

Y (64,000 units × 3/8) = 24,000 units

18. Workings

Statement Showing "Total Variable Cost for the year"

Particulars	Amount (₹)
Estimated Sales Revenue	3,02,40,000
Less: Desired Profit Margin on Sale @ 20%	60,48,000
Estimated Total Cost	2,41,92,000
Less: Fixed Selling and Distribution Overheads	69,12,000
Total Variable Cost	1,72,80,000

Statement Showing "Variable Cost per unit"

Particulars	Variable Cost p.u. (₹)
Direct Materials:	
A: 6 Kg. @ ₹ 160 per kg.	960
B: 3 Kg. @ ₹ 100 per kg.	300
Labour Cost:	
Machine Shop: 4 hrs @ ₹ 140 per hour	560
Assembly Shop: 2 hrs @ ₹ 70 per hour	140
Factory Overheads: 20% of (₹ 560 + ₹ 140)	140
Variable Selling & Distribution Expenses	60
Total Variable Cost per unit	2,160

(i) Calculation of number of units of product proposed to be sold and selling price per unit:

Number of Units Sold = Total Variable Cost/Variable Cost per unit
= ₹ 1,72,80,000 / ₹ 2,160
= 8,000 units

Selling Price per unit = Total Sales Value / Number of Units Sold
= ₹ 3,02,40,000 / 8,000 units
= ₹ 3,780

(ii) Production Budget (units)

Particulars	Units
Budgeted Sales	8,000
Add: Closing Stock	3,000
Total Requirements	11,000
Less: Opening Stock	(2,500)
Required Production	8,500

(iii) Materials Purchase Budget (Kg.)

Particulars	Material A	Material B
Requirement for Production	51,000 (8,500 units × 6 Kg.)	25,500 (8,500 units × 3 Kg.)
Add: Desired Closing Stock	8,000	5,500
Total Requirements	59,000	31,000
Less: Opening Stock	(7,500)	(4,000)
Quantity to be purchased	51,500	27,000

19. (a) **Net Realisable Value method:** The realisation on the disposal of the by-product may be deducted from the total cost of production so as to arrive at the cost of the main product. For example, the amount realised by the sale of molasses in a sugar factory goes to reduce the cost of sugar produced in the factory.

When the by-product requires some additional processing and expenses are incurred in making it saleable to the best advantage of the concern, the expenses so incurred should be deducted from the total value realised from the sale of the by-product and only the net realisations should be deducted from the total cost of production to arrive at the cost of production of the main product. Separate accounts should be maintained for collecting additional expenses incurred on:

(i) further processing of the by-product, and

(ii) selling, distribution and administration expenses attributable to the by-product.

(b) Service costing differs from product costing (such as job or process costing) in the following ways due to some basic and peculiar nature.

(i) Unlike products, services are intangible and cannot be stored, hence, there is no inventory for the services.

(ii) Use of Composite cost units for cost measurement and to express the volume of outputs.

(iii) Unlike a product manufacturing, employee (labour) cost constitutes a major cost element than material cost.

(iv) Indirect costs like administration overheads are generally have a significant proportion in total cost of a service as unlike manufacturing sector, service sector heavily depends on support services and traceability of costs to a service may not economically feasible

(c) **Controllable and un-controllable variances:** The purpose of the standard costing reports is to investigate the reasons for significant variances so as to identify the problems and take corrective action.

Variances are broadly of two types, namely, controllable and uncontrollable. Controllable variances are those which can be controlled by the departmental heads whereas uncontrollable variances are those which are beyond their control. Responsibility centres are answerable for all adverse variances which are controllable and are appreciated for favourable variances. Controllability is a subjective matter and varies from situation to situation. If the uncontrollable variances are of significant nature and are persistent, the standard may need revision.

(d) **(i)** **Standards Cost Centres:** Cost Centre where output is measurable and input required for the output can be specified. Based on a well-established study, an estimate of standard units of input to produce a unit of output is set. The actual cost for inputs is compared with the standard cost. Any deviation

(variance) in cost is measured and analysed into controllable and uncontrollable cost. The manager of the cost centre is supposed to comply with the standard and held responsible for adverse cost variances. The input-output ratio for a standard cost centre is clearly identifiable.

(ii) **Discretionary Cost Centre:** The cost centre whose output cannot be measured in financial terms, thus input-output ratio cannot be defined. The cost of input is compared with allocated budget for the activity. Example of discretionary cost centres are Research & Development department, Advertisement department where output of these department cannot be measured with certainty and co-related with cost incurred on inputs.

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