8. UNIT AND BATCH COSTING

ASSIGNMENT SOLUTIONS

PROBLEM NO:1

Statement of Cost per Unit No. of units produced: 10,000 units

Particulars	Cost per unit (Rs.)	Amount
Raw Materials Consumed	40.00	4,00,000
Direct Wages	24.00	2,40,000
Prime cost	64.00	6,40,000
Add: Manufacturing Overheads (3,200 hours × 40)	12.80	1,28,000
Works cost	76.80	7,68,000
Add: Office Overheads (10% of Works Cost)	7.68	76,800
Cost of goods sold	84.48	8,44,800
Add: Selling Overheads (10,000 units × `20)	20.00	2,00,000
Cost of sales / Total cost	104.48	10,44,800
Add: Profit (Bal Figure)	15.52	1,55,200
Sales	120.00	12,00,000

PROBLEM NO:2

$$EBQ = \sqrt{\frac{2 \times D \times S}{C}} = \sqrt{\frac{2 \times 500 \times 12 \times 60}{0.1 \times 20}} = 600 \text{ units}$$

PROBLEM NO: 3

(i) Calculation of Economic Batch Quantity (EBQ):

$$EBQ = \sqrt{\frac{2X90,000X1500}{5\%of2,200}} = \sqrt{\frac{27,00,00,000}{110}} = \text{Rs } 1567 \text{ columns.}$$

(ii) Calculation of Extra Cost due to processing of 18,000 columns in a batch

	When run size is 1,567 columns	When run size is 1,567 columns
When run size is 1,567 columns	=90,000/1,567× Rs 1,500 = Rs 87,000	=90,000/18,000 × Rs 1,500 = Rs 7,500
Total Carrying cost	½ × 1,567 × Rs110 = Rs 86,185	½ × 18,000 × Rs110 =Rs 9,90,000
Total Cost	Rs 1,73,185	Rs 9,97,500

Thus, extra cost = Rs 9,97,500 – Rs 1,73,185 = Rs 8,24,315

PROBLEM NO:4

Statement of cost per batch and per order

No. of batch = 600 units ÷ 50 units = 12 batches

	Particulars	Cost per batch (Rs)	Total Cost (Rs)
	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	

(iii) If the order is for 605 cakes, then selling price per cake would be as below

Particulars	Total Cost (Rs)
Direct Material Cost	60,500
Direct Wages (Rs 500 × 13 batches)	6,500
Oven set-up cost (Rs 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

PROBLEM NO: 5

Particulars	Jan.	Feb.	March	April	May	June	Total
Batch output (in units)	210	200	220	180	200	220	1230
Sale value (Rs)	1,680	1,600	1,760	1,440	1,600	1,760	9,840
Material cost (Rs)	650	640	680	630	700	720	4,020
Direct wages (Rs)	120	140	150	140	150	160	860
Chargeable expenses*	600	672	672	621	780	800	4,145
Total cost (Rs)	1,370	1,452	1,502	1,391	1,630	1,680	9,025
Profit per batch (Rs)	310	1485	258	49	(30)	80	815
Total cost per unit (Rs)	6.52	7.26	6.83	7.73	8.15	7.64	7.34
Profit per unit (Rs)	1.48	0.74	1.17	0.27	(0.15)	0.36	0.66

Overall position of the order for 1,200 units

Sales value of 1,200 units @ Rs 8 per unit Rs9,600

Total cost of 1,200 units @ Rs 7.34 per unit Rs 8,808
Profit = Rs 792

*Chargeable expenses/Chargeable expenses × Direct labour hours for batch

PROBLEM NO: 6

(i) Optimum run size or Economic Batch Quantity (EBQ) = $\sqrt{\frac{2DS}{C}}$

Where, D = Annual demand i.e. 1.15% of 8,00,00,000 = 9,20,000 units S = Set-up cost per run = Rs. 3,500

C = Inventory holding cost per unit per annum

= Rs.1.5 × 12 months = Rs. 18

EBQ = $\sqrt{\frac{2X9,20,000unitsx3,500}{Rs.18}}$ =18,915 units

(ii) Calculation of Total Cost of set-up and inventory holding

	Batch size	No. of set-ups	Set-up Cost (Rs.)	Inventory holding cost (Rs.)	Total Cost (Rs.)
A	40,000 units	23 9,20,000/40,000	80,500 (23 × Rs. 3,500)	3,60,000 $\frac{40,000 \times Rs.18}{2}$	4,40,500
B	18,915 units	49 $\frac{9,20,000}{18,915}$	1,71,500 (49 × Rs.3,500)	1,70,235 $\frac{(18,915XRs.18)}{2}$	3,41,735
	Extra Cost (A – B)				98,765

iii)

	Costs	Unit level	Batch level
(a)	Inventory carrying cost	Variable cost	Variable cost
(b)	Designing cost for a job	Fixed cost	Variable cost, provided the entire job work is processed in a single batch.
(c)	Machine set-up cost to run production	Fixed cost	Variable cost
(d)	Depreciation of factory building	Fixed cost	Fixed cost

PROBLEM NO: 7

i) Optimum batch size or Economic Batch Quantity (EBQ):

EBQ = $\sqrt{\frac{2DS}{C}}$ = $\sqrt{\frac{2 \times 48,000 \times 3,200}{12}}$ = 5,060 units

ii) Number of Optimum runs = 48,000 ÷ 5,060 = 9.49 or 10 run

Interval between 2 runs (in days) = 365 days ÷ 10 = 36.5 days

iii) Minimum Inventory Cost = Average Inventory × Inventory Carrying Cost per unit per annum

Average Inventory = 5,060 units ÷ 2 = 2,530 units

Carrying Cost per unit per annum= Rs.1 × 12 months = Rs.12

Minimum Inventory Holding Costs = 2,530 units × Rs. 12 = Rs.30,360

PROBLEM NO: 8

i) Optimum run size or Economic Batch Quantity (EBQ) = $\sqrt{\frac{2 \times D \times S}{C}}$

Where, D = Annual demand i.e. 1.15% of 8,00,00,000 = 9,20,000 units

S = Set-up cost per run = Rs. 3,500

C = Inventory holding cost per unit per annum

= Rs.1.5 × 12 months = Rs. 18

EBQ = $\sqrt{\frac{2 \times 9,20,000 \text{units} \times \text{Rs.}3,500}{\text{Rs.}18}}$ = 18,915 units

ii) Calculation of Total Cost of set-up and inventory holding

	Batch size	No. of setups	Set - up Cost (Rs.)	Inventory holding cost (Rs.)	Total Cost (Rs.)
A	40,000 units	23 $\left(\frac{9,20,000}{40,000}\right)$	80,500 (23 × Rs. 3,500)	3,60,000 $\left(\frac{40,000 \times \text{Rs.}18}{2}\right)$	4,40,500
B	18,915 units	49 $\left(\frac{9,20,000}{18,915}\right)$	1,71,500 (49 × Rs. 3,500)	1,70,235 $\left(\frac{18,915 \times \text{Rs.}18}{2}\right)$	3,41,735
Extra Cost (A – B)					98,765

iii)

	Costs	Unit level	Batch level
a)	Inventory carrying cost	Variable Cost	Variable Cost
b)	Designing cost for a job	Fixed Cost	Variable Cost, provided the entire job work is processed in a single batch.
c)	Machine set -up cost to run production	Fixed Cost	Variable Cost
d)	Depreciation of factory building	Fixed Cost	Fixed Cost

THE END