9. UNIT AND BATCH COSTING

ASSIGNMENT SOLUTIONS

PROBLEM NO: 1

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

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 = $\sqrt{\frac{2 \times 9,20,000 units \times Rs.3,500}{Rs.18}}$ = 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 $\left(\frac{40,000 \times Rs.18}{2}\right)$	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 $\left(\frac{18,915 \times Rs.18}{2}\right)$	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

PROBLEM NO: 2

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 (Rs. 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 (Rs.1,14,473 ÷ 605 units)	189.21

PROBLEM NO: 3

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

PROBLEM NO: 4

Particulars	Jan.	Feb.	March	April	May	June	Total
Batch output (in units)	210	200	220	180	200	220	1,230
Sales 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* (Rs.)	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	148	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	Rs. 9,600
Total cost of 1,200 units @ Rs. 7.34 per unit	Rs. 8,808
Profit	Rs. 792

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

PROBLEM NO: 5

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

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

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

THE END