PURCHASE COST

10,000 Units

₹ 10/Unit

= 100,000

↓

FIXED

ORDERING COST

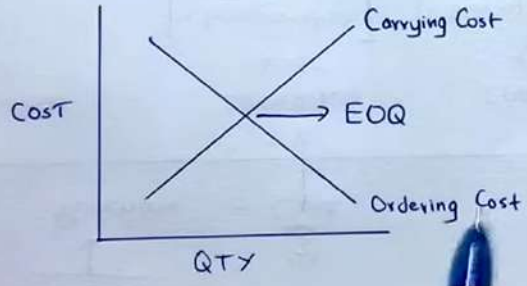
- Transportation
- Documentation
- Inspection

₹ 1000/order

CARRYING COST

- Storing Cost
- Insurance

	O.C	C.C
Quaterly (2500 Qty) → 4 Orders x 1000	= 4000	Cost ↓
Six Month (5000 Qty) → 2 Orders x 1000	= 2000	Cost ↑
At Once (10,000 Qty) → 1 Order x 1000	= 1000	Cost ↑



Problem 1: Suppose a company purchases raw material at a cost of ₹16 per unit. The annual demand is 25,000 units The carrying cost per unit is ₹6.40 and the cost of placing an order is ₹32.

A = 25,000 Units

O = ₹32

C = ₹6.40

$$EOQ = \sqrt{\frac{2AO}{C}}$$

$$= \sqrt{\frac{2 \times 25,000 \times 32}{6.40}}$$

$$= \sqrt{250,000} = 500 \text{ Qty}$$

#2 EOQ WITH BULK DISCOUNTS

MATERIAL COST

Bulk Discounts

Discounts may be available if the order quantity is above a certain size. This needs to be considered when determining the best order quantity.

The EOQ will give us the optimal order qty to minimise holding, ordering and purchase costs but it does not take any bulk discounts available.

So we need to calculate total costs at each discount level to find the lowest total cost.

Steps:

1) Calculate EOQ in normal way
2) Recalculate EOQ if it falls within a discount band because cost of holding will have changed as it is a % of purchase price.
3) Calculate the total annual cost using the formula at the EOQ.
4) Calculate annual costs at the lower boundary of each discount band above the EOQ.
5) Select order quantity that minimises costs.

FORMULAS - EOQ Related

→ $EOQ = \sqrt{\frac{2AO}{C}}$

A = Annual Demand O = Ordering Cost per order

C = carrying cost per unit per annum

→ Purchase Cost = Annual Demand × Purchase Price

→ Carrying Cost = Avg. Inventory × Carrying cost per unit per annum

→ Avg. Inventory = $\frac{1}{2}$ of Order Quantity

→ Ordering Cost = No. of Orders × Ordering Cost per order

→ No. of Orders = $\frac{\text{Annual Demand}}{\text{Order Quantity}}$

Problem 4 - EOQ - Discount and Counter Offer + Annual Demand is not given in units

A Manufacturing Company uses materials of Rs. 50,000 per year. The administration cost per purchase is Rs. 50 and carrying cost is 20% of the average inventory.

The company currently has an optimum purchasing policy but has been offered a 0.4% discount if they purchase five times per year.

Should the offer be accepted? If not, what counter offer should be made?

Solution:

#4 EOQ WITH BULK DISCOUNTS

Problem 5 - ICAI Practical Question 5 - EOQ with Bulk Discount - Tabulation Method

(a) *EXE Limited has received an offer of quantity discounts on its order of materials as under:*

Price per ton (₹)	Ton (Nos.)
1,200	Less than 500
1,180	500 and less than 1,000
1,160	1,000 and less than 2,000
1,140	2,000 and less than 3,000
1,120	3,000 and above.

The annual requirement for the material is 5,000 tons. The ordering cost per order is ₹ 1,200 and the stock holding cost is estimated at 20% of material cost per annum. You are required to COMPUTE the most economical purchase level.

(b) *WHAT will be your answer to the above question if there are no discounts offered and the price per ton is ₹ 1,500?*

(a)

Annual Demand (A)	Order Size (q)	No. of Orders A/q	Purchase Cost A x Price/unit	Ordering Cost A/q x 1200	Carrying Cost $\frac{1}{2}$ x q x 20% of price	Total Cost (PC + OC + CC)
5000 Ton	400	12.5 (13)*	60,00,000 (5000 x ₹1200)	15,600 (13 x ₹1200)	48,000 (200 x ₹240)	60,63,600
	500	10	59,00,000 (5000 x ₹1180)	12,000 (10 x ₹1200)	59,000 (250 x ₹236)	59,71,000
	1000	5	58,00,000 (5000 x ₹1160)	6,000 (5 x ₹1200)	1,16,000 (500 x ₹232)	59,22,000 ✓
	2000	2.5 (3)*	57,00,000 (5000 x ₹1140)	3,600 (3 x ₹1200)	2,28,000 (1000 x ₹228)	59,31,600
	3,000	1.666 (2)*	56,00,000 (5000 x ₹1120)	2,400 (2 x ₹1200)	3,36,000 (1,500 x ₹224)	59,38,400

Price per ton (₹)

1,200

(b) If there are no discount offers then the purchase quantity should be equal to EOQ

$$EOQ = \sqrt{\frac{2AO}{C}}$$

A = 5000 units

O = ₹1200

C = 20% of ₹1500

= 300

$$= \sqrt{\frac{2 \times 5000 \times 1200}{300}}$$

$$= \sqrt{40,000}$$

= 200 Units

The
per
mal
eco
WH
disc

ing cost
20% of
e most

ABC analysis is a method in which inventory is divided into 3 categories i.e A, B, and C in descending value.

Category	% in terms of quantity	% in terms of value $	Importance	Control	Priority
A	10%	70%	High Dollar Value $$$	Tight	1st
B	20%	20%	Medium Dollar Value $$	Medium	2nd
C	70%	10%	Low Dollar Value $.	Basic	3rd

[Based on Pareto Principle 80/20]

The items in the A category have the highest value, B category items are of of lower value than A, and C Category have the lowest value.

ABC analysis is important as it helps managers focus their time on their most valuable / important products and adapt their control policies accordingly.

The items in the A category have the highest value, B category items are of lower value than A, and C Category have the lowest value.

ABC analysis is important as it helps managers focus their time on their most valuable / important products and adapt their control policies accordingly.

A — Tight Control
- Check the Stock Levels periodically
- Make Budgets
- Evaluate issues
- Avoid Stock Out by making extra efforts
- Secured Areas while storing them
- Have EOQ for all materials in this Category

B — Medium Control
- Control when there is a need.

C — Basic Control
- Minimum control
- Managed by Junior staff

#2 ABC Analysis - Inventory Control

Problem 1 - ABC Analysis - Inventory Control - Material Costing

ILLUSTRATION 8

From the following details, DRAW a plan of ABC selective control:

Item	Units	Unit cost (₹)
1	7,000	5.00
2	24,000	3.00
3	1,500	10.00
4	600	22.00
5	38,000	1.50
6	40,000	0.50
7	60,000	0.20
8	3,000	3.50
9	300	8.00
10	29,000	0.40
11	11,500	7.10
12	4,100	6.20

Statement of Total Cost and Ranking

Item	Units	% of Total units	Unit cost (₹)	Total cost (₹)	% of Total cost	Ranking
1	7,000	3.1963	5.00	35,000	9.8378	4
2	24,000	10.9589	3.00	72,000	20.2378	2
3	1,500	0.6849	10.00	15,000	4.2162	7
4	600	0.2740	22.00	13,200	3.7103	8
5	38,000	17.3516	1.50	57,000	16.0216	3
6	40,000	18.2648	0.50	20,000	5.6216	6
7	60,000	27.3973	0.20	12,000	3.3730	9
8	3,000	1.3699	3.50	10,500	2.9513	11
9	300	0.1370	8.00	2,400	0.6746	12
10	29,000	13.2420	0.40	11,600	3.2605	10
11	11,500	5.2512	7.10	81,650	22.9502	1
12	4,100	1.8721	6.20	25,420	7.1451	5
	2,19,000	**100**		**3,55,770**	**100**	

On this basis, a plan of A B C selective control is given below:

Ranking	Item Nos.	% of Total units	Cost (₹)	% of Total Cost	Category
1	11	5.2512	81,650	22.9502	
2	2	10.9589	72,000	20.2378	
3	5	17.3516	57,000	16.0216	
Total	**3**	**33.5617**	**2,10,650**	**59.2096**	**A**
4	1	3.1963	35,000	9.8378	
5	12	1.8721	25,420	7.1451	
6	6	18.2648	20,000	5.6216	
7	3	0.6849	15,000	4.2162	
Total	**4**	**24.0181**	**95,420**	**26.8207**	**B**
8	4	0.2740	13,200	3.7103	
9	7	27.3973	12,000	3.3730	
10	10	13.2420	11,600	3.2605	
11	8	1.3699	10,500	2.9513	
12	9	0.1370	2,400	0.6746	
Total	**5**	**42.4202**	**49,700**	**13.9697**	**C**
Grand Total	12	100	3,55,770	100	

Activity	Predecessor	Duration
A	–	3
B	A	4
C	A	2
D	B	5
E	C	1
F	C	2
G	D, E	4
H	F, G	3