

Economic Order Quantity (EOQ)

1. Re-order Quantity (ROQ): 'Order size repeated by any business organization'

2. Ordering Cost: 'Cost associated with placement of orders' = $\frac{A}{ROQ} \times O$

= $\frac{A}{ROQ} \times O$

E.g. ROQ: Case 1 = 1,000 kg; Case 2 = 2,000 kg; O = 50; A = 10,000 kg
 $\frac{A}{ROQ} \times O = \frac{10,000}{1,000} \times 50; \frac{10,000}{2,000} \times 50$

3.

→ Storage Cost + Interest (Opportunity Cost) + Obsolescence

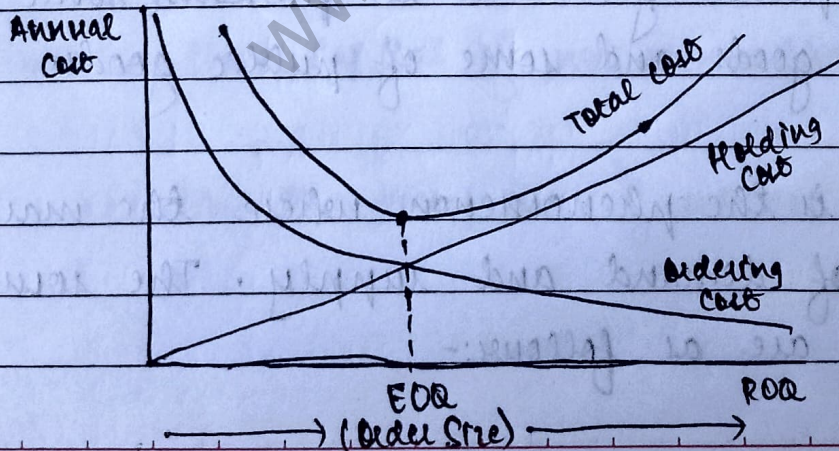
3. Carrying Cost: 'Cost associated with holding of Avg. Raw Material Stock' = $1/2 \times ROQ \times C$

E.g. Cpu = £2, Storage Cost = 8% of Avg. Inventory
 ROQ → Case 1: 1,000 kg; Case 2: 2,000 kg

Case 1: $1/2 \times 1,000 \times 0.16 = £80$

Case 2: $1/2 \times 2,000 \times 0.16 = £160$

4. Economic Order Quantity (EOQ): 'Order size at which total of ordering and carrying cost will be lowest'



At EOQ = $\sqrt{\frac{2 \times A \times D}{C}}$ Eg. $A = 10,000 \text{ kg}, D = ₹ 350, C = ₹ 2, P = ₹ 2, C = 8\%$
 $= \sqrt{\frac{2 \times 10,000 \times 350}{8\% \times 2}} = ₹ 2,500 \text{ kg}$
 $A = \text{Annual Con}$

A = Annual Consumption + Closing Stock - Opening Stock

$A = (10,500 + 5,00 - 1,000) \text{ units} \approx 10,000 \text{ units}$
 $EOQ = \sqrt{\frac{2 \times 10,000 \times 350}{10\% \times 200}} = 500 \text{ units}$

5. Extra Cost / Saving in cost by using EOQ

i) Calculate EOQ with details ii) Prepare Comparison Table

Particulars	At ROQ (Size)	At EOQ (Size)
A. Ordering Cost $(\frac{A}{ROQ} \times D)$	xxx	xxx
B. Carrying Cost $(\frac{1}{2} \times ROQ \times C)$	xxx	xxx
C. Total (A+B)	xxx	xxx

Diff = Saving / Exp

6. Evaluation of Discount Offer → For order size other than EOQ

i) Calculate EOQ with details ii) Purchase Price = Original MRP - Discount

iii) Prepare Comparison Table considering new purchase price

Particulars	EOQ At ROQ (Size)	Order size At EOQ (Size)
A. Purchase Cost (New after discount) $(A \times \text{New PP})$	xxx	xxx
B. Ordering Cost $(\frac{A}{ROQ} \times D)$	xx	xx
C. Carrying Cost $(\frac{1}{2} \times ROQ \times C)$	xx	xx
D. Total (A+B+C)	xxx	xxx

Diff = Discount

7. Most Economical Purchase level in case of multiple discount offers

a) Here, Purchase level → Class Interval → Lower Limits - Higher Limits

b) Select Random ROQ from each class Interval (Purchase level).
 Any class mark / lower limit / upper limit

c) Note: choose upper limits in 1st class Interval (Purchase level & lower limits in other intervals / levels)

c) Prepare Statement of Most Economical Purchase level

Statement of most economical purchase level (Formab)

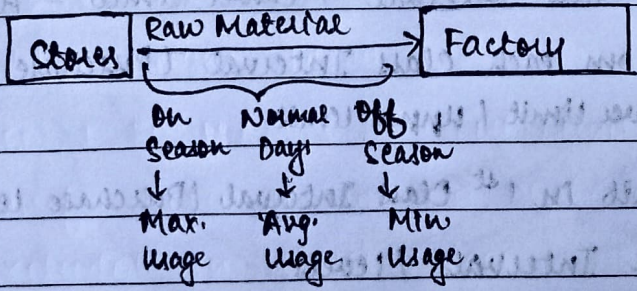
	Order Size (ROQ) (ROQ)	Total Ordering Cost $(\frac{A}{ROQ} \times D)$	Total Carrying Cost $(\frac{1}{2} \times ROQ \times C)$	Purchase Cost (A x P)	Total Cost (A) + (B) + (C) + (D)
	(A)	(B)	(C)	(D)	
Differens ←	Upper limit	xx	xx	xx	xx
	Lower limit	xx	xx	xx	xx
Same in all levels ↓	Lower limit	xx	xx	xx	xx
	" "	xx	xx	xx	xx
	" "	xx	xx	xx	xx

Conclusion: Most Economical Purchase level = lowest Total Cost

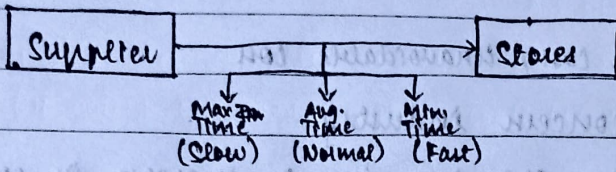
8. Various Stock level

- (i) Re-order level (ROL) : When to order
- (ii) ROQ/EOQ : How much to order
- (iii) Max. Stock level : Up to How much to stock
- (iv) Min. Stock level : At least How much to stock
- (v) Avg. Stock level : Stock normally kept
- (vi) Danger Stock level : Kept for Emergency Requirement (less sudden)
- (vii) Buffer Stock : To mitigate (excess) stock demand

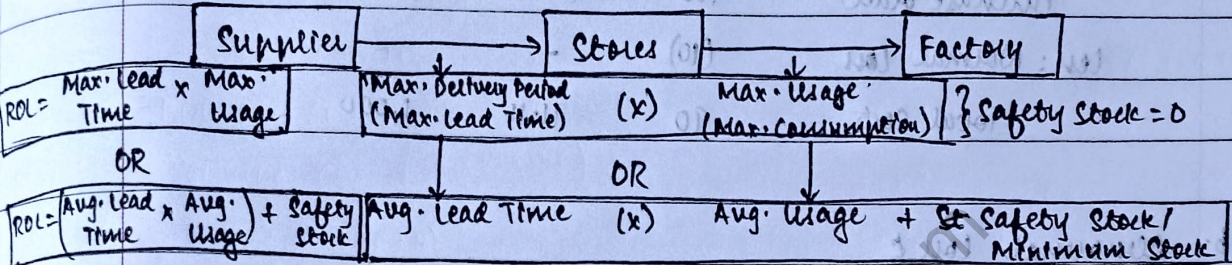
a) Consumption Rate / Usage Rate of Raw Materials



b. Delivery Period / Lead Time / Re-order Period



c. Re Order Level (ROL) / Ordering level / Re Order Point



d. Maximum Stock Level → less outflow of stock from stores
 Order Placed During ROL → $\frac{\text{Fast Delivery}}{\text{Min. Lead Time}} \times \frac{\text{off Season}}{\text{Min. Usage}} + \text{ROQ}$

$$\text{Max. Stock Level} = \text{ROL} + \text{ROQ} \rightarrow (\text{Min. Usage} \times \text{Min. Lead Time})$$

e. Avg. Stock Level = $\frac{\text{Max. level} + \text{Min. level}}{2} \text{ OR } \left(\frac{1}{2} \times \text{ROQ} \right) + \text{Min. Stock level}$

f. Danger Stock Level = $\text{Avg. Usage} \times \text{Emergency lead Time (Preferred)}$

g. ABC Analysis **Stock** →
 A → Value ↑ Qty ↓ → Eg. Diamond
 B → Value = Qty = → Eg. Gold
 C → Value ↓ Qty ↑ → Eg. Silver

10. Financing Issue Pricing of Material
 Statement showing cost per unit

Particulars	Amount (₹)
Purchase Price	xxx
less: Trade / Qty. Discount (Cash Discount x)	(xxx)
less: Subsidy / Grant / Incentives (Govt)	(xxx)
Add: Road Tax / Port Toll Tax	xxx
Add: IGST / CGST / SGST / custom duty (ITC Avelled x)	xxx
Add: Insurance	xxx
Add: Commission / Brokerage on purchase	xxx
Add: Freight Inwards	xxx
Add: Net cost of containers or packing material (When not returnable or container low value)	xxx
Total Cost	xxx
Divide: Effective Units (No.)	xxx
(Total Units - Normal Shortage + Prov ⁿ for add. shortage)	xxx

11. Normal loss, Abnormal loss

a. Normal loss / Standard loss / Unavoidable loss

1. Avg. / Std. loss of concern industry

2. Customer will suffer this loss due to increase in cost (per unit).

E.g.

Particulars	Qty.	Rate	Value (Qty. × Rate)
Purchase Order	100	10	1,000
Less: Normal loss	(10)	-	-
Total cost	90	11.11	1,000

b. Abnormal loss &

1. Loss over & above Normal loss

2. Businessman will suffer this loss → Costing P&L (Dr)

3. No Impact on CPU (Cost per unit)

E.g.

Particulars	Qty.	Rate	Value (Qty. × Rate)
Purchase Order	100	10	1,000
Less: Abnormal loss	(10)	10	(100)
Total cost	90	10	900

12. Inventory Turnover Ratio: $\frac{\text{Material Consumed}}{\text{Avg. Inventory}}$

↳ In Days: $\frac{365 \text{ Days}}{\text{Inventory Turnover Ratio}}$

13.

Stores Ledger (Proforma)

Date	Receipts			Issued			Balance		
	Units	Rate	Value	Units	Rate	Value	Units	Rate	Value
	Qty.	Per Unit	Total Amt.						

FIFO, LIFO, WAM & Avg. Cost / Unit = Total Cost / Total Units

Note:

1) Transfer Between Two Jobs, Dept., Branches in Factory is excluded in stores ledger

2) Return to Supplier → Issue Side × Supplier's Rate

3) Return to Stores → Receipts Side × Issued Rate

4) Shortage

→ Issue Side as per the methods (Transfer to Costing P&L)

5) Material Consumed → Total Value (-) Return to Stores (-) Shortage (-) Return to Supplier (Mat. Issued)