# 11
CHAPTER

# Inventory Management

| THEORY | |
|---|---|
| **Economic Order Quantity (EOQ)** | <ul><li>If purchases of material are made in bulk then inventory carrying cost will be high.</li><li>If order size is small each time, then the ordering cost will be high.</li><li>The size of the order for which both ordering and carrying cost are minimum is known as economic order quantity</li><li>Economic Order Quantity = $\sqrt{\dfrac{2 \times A \times O}{C}}$ <br> A = Annual demand / annual consumption in units <br> O = Cost of placing and receiving an order <br> C = Carrying cost per unit per annum</li></ul> |
| **Ordering Cost** | These are the costs which are associated with the purchasing or ordering of materials. It includes costs like tender invitation, transportation of goods, inspection costs etc. |
| **Carrying Cost** | These are the costs for holding or storing goods in the stores. It includes costs like storage, rent, insurance, spoilage, deterioration etc. |
| **Assumptions of EOQ** | <ul><li>Annual consumption/usage/requirement of raw material is known in advance.</li><li>Ordering cost per order is known and constant.</li><li>Cost per unit of the material to be purchased is known and it is constant.</li><li>Carrying cost is computed on average inventory ordered.</li><li>The rate of carrying cost remains constant.</li><li>The consumption/usage of material is expected to be even throughout the year.</li></ul> |
| **ABC Analysis** | <ul><li>It stands for Always Better control Analysis.</li><li>It exercises discriminating Control over various items of inventory by classifying them into different categories on the basis of value, quantity, frequency of replacement etc.</li></ul> |

| Category | % in total value | % in total quantity | Extent of control |
|---|---|---|---|
| A | 70% | 10% | Strict control through stock levels, EOQ etc. |
| B | 20% | 20% | Need based selective control |
| C | 10% | 70% | Little control – Focus on saving associated costs |

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| **Advantages of ABC analysis** | ❑ **Smooth Flow –** It ensures that, there should be no danger of interruption of production. <br> ❑ **Cost saving –** The cost of placing orders, receiving goods and maintaining stocks is minimized. <br> ❑ **Control by exception –** Management time is saved since attention need to be paid only to some of the items rather than all the items. <br> ❑ **Standardization of work –** It makes much of the work systematized on a routine basis. |
| **Limitations of ABC Analysis** | ❑ In order to be fully effective it should be carried out with standardization and codification. <br> ❑ It is based on gradation of different items, which may include a lot of subjective elements. <br> ❑ The result of ABC analysis should be reviewed periodically and updated. |
| **Stock Out** | ❑ The demand for materials may fluctuate and delivery of inventory may also be delayed and in such a situation the firm can face a problem of stock-out. <br> ❑ The sock-out can prove costly by affecting the smooth working of the concern. <br> ❑ In order to protect against the stock out arising out of usage fluctuations firms usually maintain some margin of safety. <br> ❑ Two costs are involved in the determination of this stock i.e. opportunity cost of stock-outs and the carrying costs. |

## PRACTICAL QUESTIONS

**1.** A company's requirements for ten days 6,300 units. The ordering cost per order is ₹10 and the carrying cost per unit is ₹0.26. You are required to calculate the economic order quantity.

[**Sol.** 696 units]

**2.** SK Ltd. uses a large quantity of salt in its production process. Annual consumption is 60,000 tonnes over a 50 week working year. It costs ₹100 to initiate and process an order and delivery follow two week later. Storage costs for the salt are estimated at ₹0.10 per tonne per annum. The current practice is to order twice a year when the stock falls to 10,000 tonnes. Identify an appropriate ordering policy for SK ltd. and contrast it with the cost of the current policy.

[**Sol.** Savings = ₹1,312.30]

**3.** SK company is a distributor of air filters to retail stores. It buys its filters from several manufacturers. Filters are ordered in lot sizes of 1,000 and each order costs ₹40 to place. Demand from retail stores is 20,000 filters per month, and carrying cost is ₹0.10 a filter per month.

  (*a*)  Compute the optimal order quantity with respect to so many lot sizes?

  (*b*)  Calculate the optimal order quantity if the carrying cost were ₹0.05 a filter per month?

  (*c*)  Compute the optimal order quantity if ordering costs were ₹10?

[**Sol.** (*a*) 4; (*b*) 5.66; (*c*) 2]

**4.** A company requires 36,000 units of a product per year at a cost of ₹100 per unit. Ordering cost per order is ₹250 and the carrying cost is 4.5% per year of the inventory cost. Normal lead time is 25 days and safety stock is NIL.

Assume 360 working days in a year.

  (i)  Calculate the Reorder Inventory Level

  (ii)  Calculate the Economic Order Quantity (EOQ)

  (iii)  If the supplier offers 1% quantity discount for purchase in lots of 9,000 units or more, should the company accept the proposal?

[**Sol.** (i) 250 units; (ii) 2000 units; (iii) accept the offer]