

Inventory control

1. The annual demand for a product is 3600 units with an average of 12 units per day. The lead time is 10 days. The ordering cost per order is Rs. 20.00 and the annual carrying cost is 25% of the value of inventory. The price of the product per unit is Rs. 3.00.
 - What will be the EOQ?
 - find purchase cycle time
 - find the total inventory cost per year
 - If the safety stock of 100 units is considered necessary, what will be the reorder level and the total annual cost of inventory.
2. A company has demand of 12000 units per year for an item and it can be produced 2000 such an item per month. The cost of one set up is Rs. 400 and the holding cost per unit per month is Rs. 0.15. The shortage cost of one unit is Rs. 20 per year. Find the optimum lot size and the total cost per year assuming the cost of one unit is Rs. 4.00. Also find the maximum inventory, manufacturing time and total time interval.
3. The demand for an item is deterministic and constant over time at 6000 units per year, the item costs Rs. 50.00 per unit and the cost of placing an order is estimated to be Rs. 5.00. The inventory carrying cost is 20% and the shortage cost is Rs. 1.00 per unit per month. Find the optimal ordering quantity if stockouts are permitted and the unit can be back ordered at the shortage cost indicated. What will be the company loss if stockouts are not permitted.
4. The demand for an item is deterministic and constant over time and it is equal to 650 units per year. The per unit cost of the item is Rs. 50, while the cost of placing an order is Rs. 5. The inventory carrying cost is 20% of the inventory per annum and the cost of shortage is Rs. 1.50 per unit per month. Find the optimal ordering quantity when stockouts are permitted if the stockout is not permitted what would be the loss to the company.
5. XYZ company requires 60 units of raw materials per day for its production use. The following data has given.
 - Shortage cost Rs. 3 per unit of raw material per day
 - Holding cost Rs. 1 per unit of raw material per month
 - Ordering costs Rs. 30 per order
 - Price per unit of raw material is Rs. 50.
 - Procurement lead time is 2 days
 Find the following
 - i. EOQ
 - ii. Optimum inventory level at the beginning of each cycle
 - iii. Total costs per day
 - iv. Minimum cost
 - v. Sketch the inventory process

6. ABC company requires 150 oil bearings per day, cost of each bearing is Rs200. holding costs are 20 paise per bearing per day and ordering costs is Rs20.

Find

- EOQ
 - reordering point if lead time is 3 days
 - minimum costs
 - derive the inventory model you use and sketch the inventory procurement cycle.
7. Find the optimum order quantity for a product for which the price breaks are as follows

Quantity	unit cost(Rs)
$0 \leq Q_1 < 500$	10.00
$500 \leq Q_2$	9.25

The monthly demand for the product is 200 units, the cost of storage is 2% of the cost and the cost of ordering is 350.

In the above problem if the ordering cost is Rs100 instead of Rs 350 find the optimum order quantity.

8. An oil engine manufacturer purchase lubricants at the rate of Rs 42 per piece from a vendor. The requirement of these lubricants is 1800 per year. What should be the order quantity per order if the cost per placement of an order is Rs. 16 and the inventory carrying charges per rupee per year is only 20 paise.
9. An electrical appliance manufacturer wishes to know what the economic quantity should be for a plastic impeller when the following information is available. The average daily requirement is 120 units and the company has 250 working days a year, so that the total yearly requirement is approximately 30000 units a year. The manufacturing cost is 50 paise per part. The sum if the annual rate for interest, insurance, taxes and so forth 20% of the unit cost and the cost of preparation is Rs 50 per lot.
10. A contractor has to supply 10000 bearings per day to an automobile manufacturer. He finds that, when he starts a production run, he can produce 25000 bearings per day. The cost of holding a bearing in stock for one year is 20 paise and the set up cost of a production run is Rs 180. how frequently should production run be made.
11. A commodity is to be supplied at a constant rate of 200 units per day supplies of any amount can be had at any required time, but each ordering costs Rs50.00, cost of holding the commodity in inventory is Rs2.00 per unit per day while the delays in the supply of the item includes a penalty of Rs10.00 per unit per delay of 1 day.
- Find the optimal policy (q, t) where t is the re-order cycle period and q is the inventory level after re order. What would be the best policy if the penalty cost becomes infinity?