RAS_601_20200410

DAY-7

UNIT-3 LECTURE-5

INVENTORY CONTROL

INVENTORY MEANS...

All the materials , parts, suppliers, expenses and in process or finished products recorded on the books by an organization and kept in its stocks, warehouses or plant for some period of time.

DEFINITION OF INVENTORY CONTROL

Inventory control is the technique of maintaining the size of the inventory at some desired level keeping in view the best economic interest of an organization.

Type of Inventory	Reason for holding the Inventory
(1) Raw materials	To reap the price advantage available on seasonal raw materials.
(2) Work in progress	To balance the production flow.
(3) Ready made components	When the components are bought rather than made.
(4) Scraps	They are disposal of in bulk.
(5) Finished Goods	Lying in stock rooms and waiting dispatches

OBJECTIVES OF INVENTORY CONTROL

- Protection against fluctuations in demand;
- Better use of men, machines and material;
- Protection against fluctuations in output;
- Control of stock volume;
- Control of stock distribution.

MAJOR ACTIVITIES OF INVENTORY CONTROL

- Planning the inventories;
- Procurement of inventories;
- Receiving and inspection of inventories;
- Storing and issuing the inventories;
- Recording the receipt and issues of inventories.
- Physical verification of inventories;
- Follow-up function ;
- Material standardization and substitution.

SOME TERMINOLOGIES:

- Reorder Point: The point of time when the order must be placed. It depends on how much is left in the stock.
- Lead Time: is the gap of time between placing an order and receiving an order.
- Consumption Rate: The rate at which the material is getting consumed over a period of time.
- Safety Stock: stock for usage at normal rate during the extension of lead times.
- Maximum level: it is the level of stock, beyond which a firm should not maintain the stock
- Minimum level: it is the minimum stock to be maintained for smooth production.

Types of Inventory Costs

- Ordering (purchasing) costs
- Inventory carrying (holding) costs
- Out of stock/shortage costs
- Other costs

Ordering Costs

- It is the cost of ordering the item and securing its supply.
- Includes-
  - Expenses from raising the indent
  - Purchase requisition by user department till the execution of order
  - Receipt and inspection of material

Inventory Carrying Costs

- Costs incurred for holding the volume of inventory and measured as a percentage of unit cost of an item.
- It includes-
  - Capital cost
  - Obsolescence cost
  - Deterioration cost
  - Taxes on inventory
  - Insurance cost
  - Storage & handling cost

CARRYING COSTS

- Capital costs
- Storage space costs
- Inventory service costs
- Handling-equipment costs
- Inventory risk costs

OUT-OF-STOCK COSTS

- It is the loss which occurs or which may occur due to non availability of material.
- It includes-
  - Break down/delay in production
  - Back ordering
  - Lost sales
  - Loss of service to customers, loss of goodwill, loss due to lagging behind the competitors, etc.

OTHER COSTS

- Capacity Costs
  - Over-time payments
  - Lay-offs & idle time
- Set-up Costs
  - Machine set-up
  - Start-up scrap generated from getting a production run started
- Over-stocking Costs

Inventory control is a planned approach of determining

- What to order?
- When to order?
- How much to order?
- How much to stock to avoid any discontinuity in our manufacturing process?

Inventory management and control ensures that the costs associated with buying and storing are optimal without interrupting production and sales.

Inventory control basically deals with two problems:

1. When should an order be placed?
2. How much should be ordered – so, Order quantity *(Economic Order Quantity, EOQ model)*

Economic Ordering Quantity

EOQ is the amount of inventory to be ordered at one time for purposes of minimizing annual inventory cost.

Formula for Economic Ordering Quantity :

$$EOQ = \sqrt{\frac{2 \times \text{Annual Consumption} \times \text{Ordering Cost}}{\text{Storage(holding)cost per unit}}}$$

- Ordering Cost: Cost of placing single order.
- Holding Cost: Cost to hold one unit inventory for a year

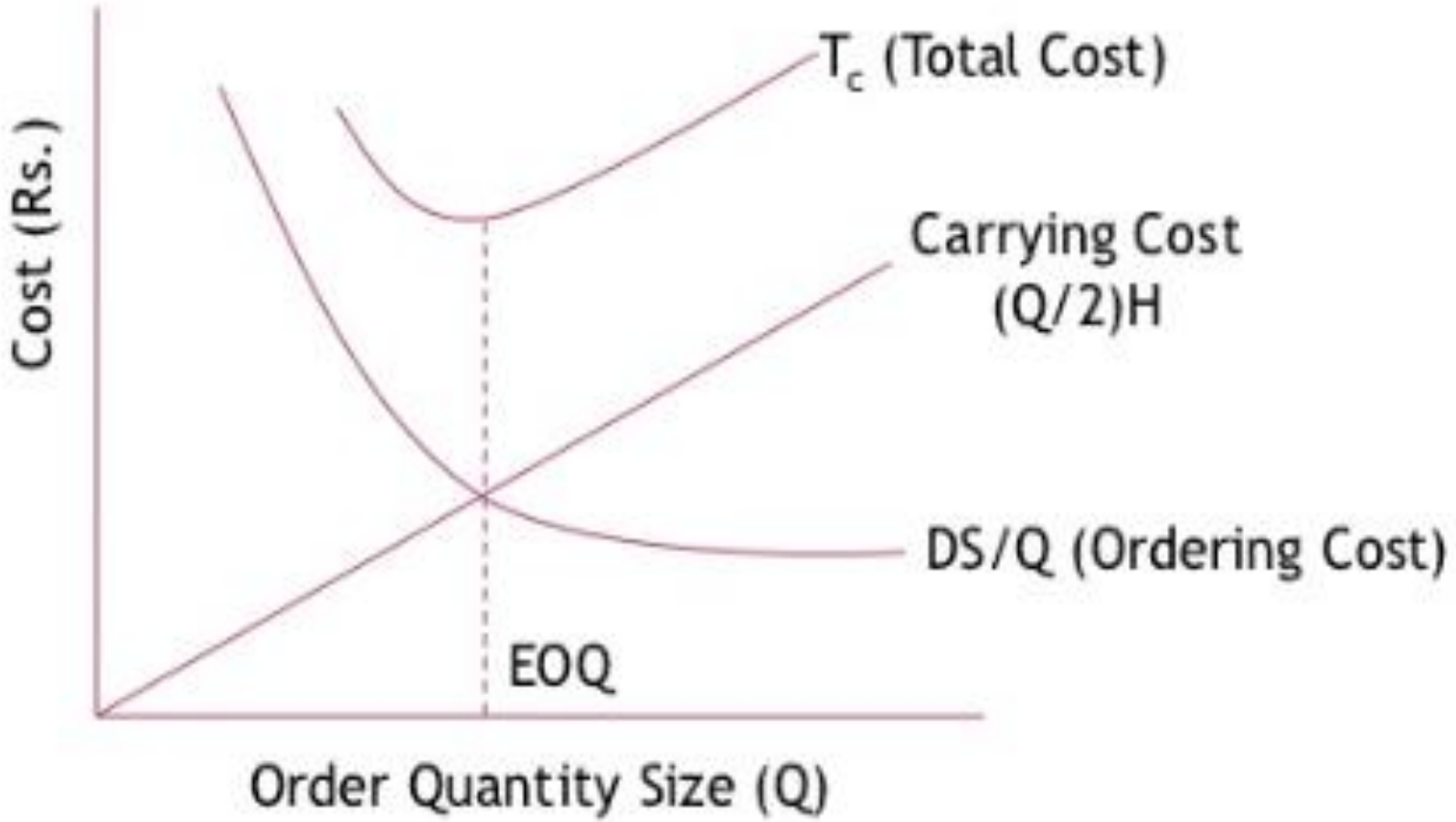
Basic Fixed Order Quantity Model (EOQ)

Total Annual Cost = Annual Purchase Cost + Annual Holding Cost + Annual Ordering Cost

$$TC = DC + \frac{Q}{2}H + \frac{D}{Q}S$$

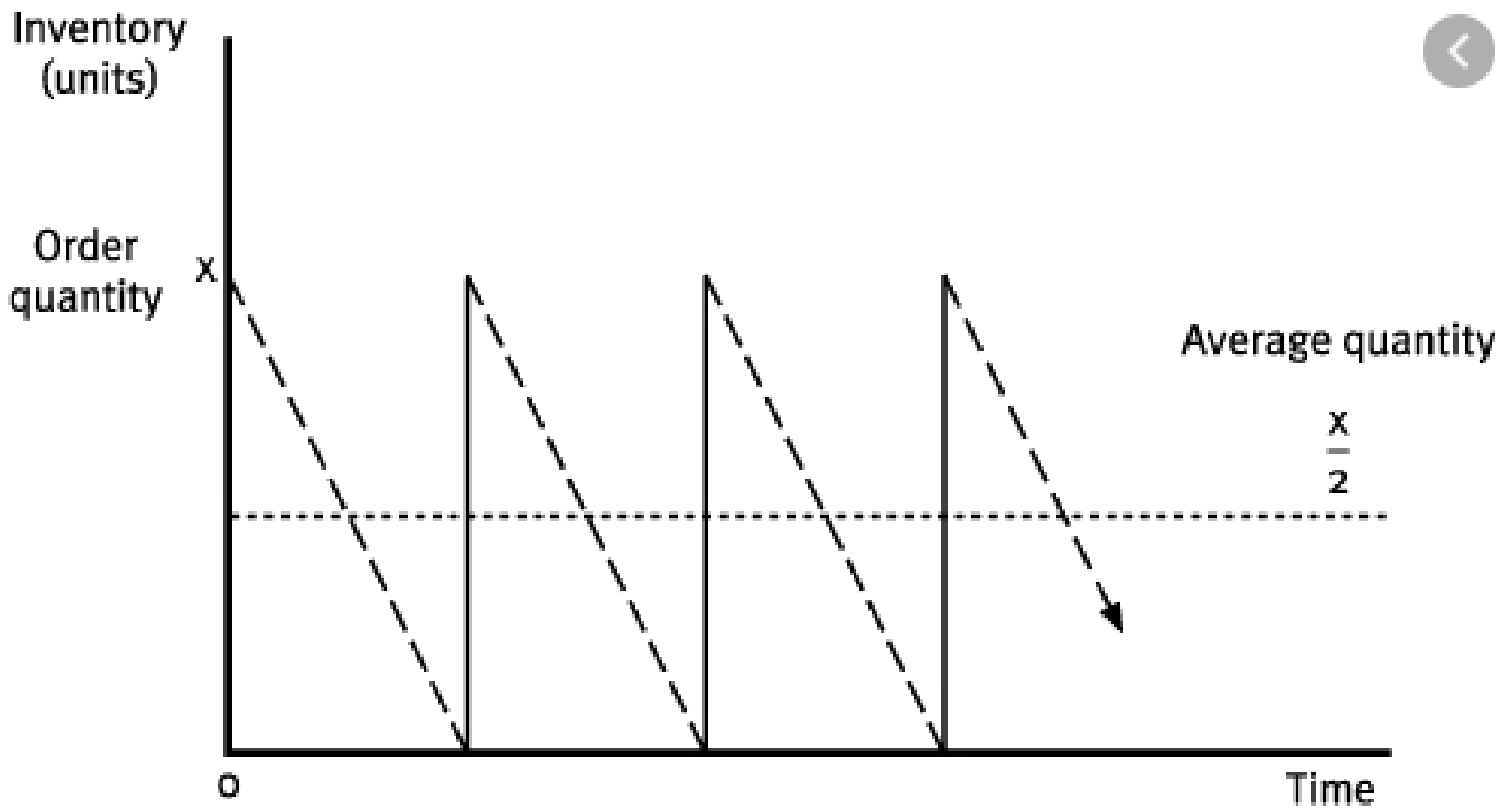
$$EOQ = \sqrt{\frac{2DS}{H}}$$

TC = Total annual cost
D = Demand
C = Cost per unit
Q = Order quantity
S = Cost of placing order/setup cost
H = Annual holding and storage cost per unit of inventory


Cost (Rs.)
T_c (Total Cost)
Carrying Cost
(Q/2)H
DS/Q (Ordering Cost)
EOQ
Order Quantity Size (Q)

Assumptions of EOQ

- Demand for the product is constant
- Lead time is constant
- Price per unit is constant
- Inventory carrying cost is based on average inventory
- Ordering costs are constant per order
- All demands for the product will be satisfied (no back orders)


Inventory
(units)
Order
quantity
x
Average quantity
x
2
0
Time

Always Better Control (ABC) Analysis

- This technique divides inventory into three categories A, B & C based on their annual consumption value.
- It is also known as Selective Inventory Control Method (SIM)
- This method is a means of categorizing inventory items according to the potential amount to be controlled.
- ABC analysis has universal application for fields requiring selective control.

Procedure for ABC Analysis

- Make the list of all items of inventory.
- Determine the annual volume of usage & money value of each item.
- Multiply each item's annual volume by its rupee value.
- Compute each item's percentage of the total inventory in terms of annual usage in rupees.
- Select the top 10% of all items which have the highest rupee percentages & classify them as "A" items.
- Select the next 20% of all items with the next highest rupee percentages & designate them "B" items.
- The next 70% of all items with the lowest rupee percentages are "C" items.

Advantages of ABC Analysis

- Helps to exercise selective control
- Gives rewarding results quickly
- Helps to point out obsolete stocks easily.
- In case of “A” items careful attention can be paid at every step such as estimate of requirements, purchase, safety stock, receipts, inspections, issues, etc. & close control is maintained.
- In case of “C” items, recording & follow up, etc. may be dispensed with or combined.
- Helps better planning of inventory control
- Provides sound basis for allocation of funds & human resources.

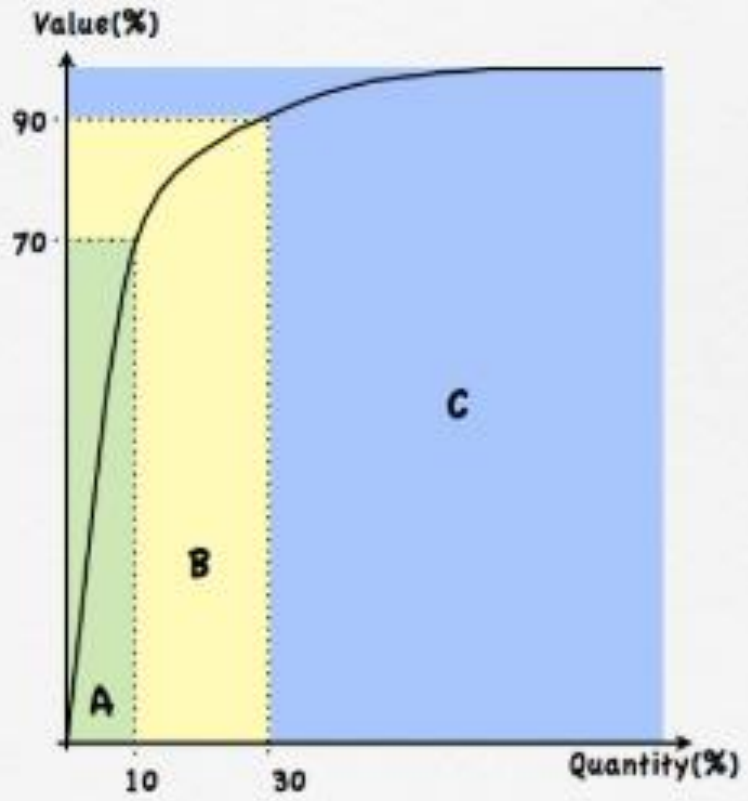
Disadvantages of ABC Analysis

- Proper standardization & codification of inventory items needed.
- Considers only money value of items & neglects the importance of items for the production process or assembly or functioning.
- Periodic review becomes difficult if only ABC analysis is recalled.
- When other important factors make it obligatory to concentrate on “C” items more, the purpose of ABC analysis is defeated.

ABC Analysis

- ✓ An inventory categorization technique used in materials management.
- ✓ Known as *Selective Inventory Control.*
- ✓ Based on the Pareto Analysis (80/20).
- ✓ ABC analysis based on user defined criteria.

Criteria	Class		
	A	B	C
Number of Items	10%	20%	70%
Value, $	70%	20%	10%
Stock Control	Strict	Moderate	Loose
Delivery Cycle	Weekly	3 months	6 months
Control Report	Weekly	Monthly	Quarterly
Importance	High	Moderate	Low
Forecast	Accurate	Estimate	Roughly
Control Effort	Max	Moderate	Min
Sources	Max	> 2	2



VED Classification

- VED: Vital, Essential & Desirable classification
- VED classification is based on the criticality of the inventories.
- Vital items – Its shortage may cause havoc & stop the work in organization. They are stocked adequately to ensure smooth operation.
- Essential items - Here, reasonable risk can be taken. If not available, the plant does not stop; but the efficiency of operations is adversely affected due to expediting expenses. They should be sufficiently stocked to ensure regular flow of work.
- Desirable items – Its non availability does not stop the work because they can be easily purchased from the market as & when needed. They may be stocked very low or not stocked.

- It is useful in capital intensive industries, transport industries, etc.
- VED analysis can be better used with ABC analysis in the following pattern:

Category	"V" items	"E" items	"D" items
"A" items	Constant control & regular follow up	Moderate stocks	Nil stocks
"B" items	Moderate stocks	Moderate stocks	Low stocks
"C" items	High stocks	Moderate stocks	Very low stocks

THANK YOU