Q. P. code :- 54385

Class: SYBTM (TRANSPORT MANAGEMENT)

SUBJECT- WAREHOUSING AND INVENTORY CONTROL

Q1 A) MCQ

1. ABC
2. Inventory
3. Consumer packaging
4. ERP
5. Decentralized
6. Dedicated
7. DRP
8. Order Picking
9. Bonded warehouse
10. FSN

B) TRUE OR FALSE

1. True
2. True
3. True
4. False
5. False
6. True
7. True
8. False
9. False
10. True

Q2 a) *Characteristics of Ideal Warehouses

The characteristics of ideal warehouses are as follows:

- Warehouse should be located at a convenient place near highways, railway stations, airports and seaports where goods can be loaded and unloaded easily.

- Mechanical appliances should be there to loading and unloading the goods. This reduces the wastages in handling and also minimises handling costs.

- Adequate space should be available inside the building to keep the goods in proper order.

- Ware houses meant for preservation of perishable items like fruits, vegetables, eggs and butter etc. should have cold storage facilities.

- Proper arrangement should be there to protect the goods from sunlight, rain, wind, dust, moisture and pests.

- Sufficient parking space should be there inside the premises to facilitate easy and quick loading and unloading of goods.

- Round the clock security arrangement should be there to avoid theft of goods.

- The building should be fitted with latest fire-fighting equipments to avoid loss of goods due to fire.

b) Functions of Warehousing

The various functions of warehousing are:
i. Storage of goods
ii. Protection of goods
iii. Risk bearing
iv. Financing
v. Processing
vii. Transportation

Q2 Advantages of private warehouses

Advantages
1. Private warehousing offers better monitoring systems over the handling and storage of products as required by the management from time to time which would enhance the performance of the warehouse.
2. There is less likelihood or error in the case of private warehousing since the company's products are handled by its own employees who are able to identify the products of their own company.

3. If there is sufficient volume of goods to be warehoused, the cost of private warehousing comparatively less than that of public warehousing.

4. Private warehousing is the best choice for some of the locations and the products handled because of the non-availability of the public warehousing.

5. Private warehousing has the opportunity to specially design its facilities for automatic material handling equipment whereas public warehousing may have the same.

6. Enabling the end user to increase their efficiency by means of better design and structured lay-out.

7. Efficient use of human resources in warehouse operation improves end users' overall performance

8. Intangible benefits in the form of cost reduction in all the warehouse operations.

Q2. Issues affecting warehousing

In today's materials handling industry, it is fundamental for companies to ensure the smooth running of their warehouses. Efficiency and organisation within every aspect of the business is essential in order to gain a competitive advantage. Some of the most common warehousing issues are as follows:

1. Insufficient Warehouse Space
2. Slow Picking Processes and Stock Discrepancies
3. Warehouse Slotting Problems
4. Inaccurate Quantities
5. Capacity
6. Damage
7. Product Identification
8. Training

Q3 A) A warehouse storage system refers to storage equipments that are used to help you easily manage your warehouse and keep the workers as well as the products and items inside the warehouse safe.

Factors influencing Storage Systems

▶ Physical characteristics of goods stocked, i.e. size, shape, weight, package, unit load weight.

▶ Contamination risks, i.e. isolation storage systems and protective packaging are been used.

▶ Hazardous factors,

▶ Deterioration factors.

▶ Value of the goods.

- ▶ Number of line items, e.g. high or low line items.
- ▶ Stock and throughput levels, e.g. turnover frequency, incoming and outgoing volumes.
- ▶ Capital availability, i.e. setting up a automated storage system or manual storage system.
- ▶ Free height of the building
- ▶ Flatness of the floor
- ▶ Bearing power of the floors, i.e. able to bear heavy loads.

B) The goal of warehouse layout design is to optimize your warehousing functions and achieve maximum efficiency and space utilization.
A warehouse is typically divided into areas to support your every-day processes. These areas include: reserve storage, forward pick, cross docking, shipping, receiving, assembly/special handling lines, and quality/inspection area.
When considering the layout and operation of any warehouse system, The principles are:

1) Using the most suitable unit load

2) Making the best use of space

3) Minimizing movement

4) Controlling movement and location

5) Providing safe, secure and environmentally sound conditions

6) Maintaining at minimum overall operating cost

Q3 Warehousing Operations Process

1. Receiving-
2. Put-Away
3. Storage
4. Order Picking
4. Packing
5. Shipping

Q4 A Material Requirement Planning

Material requirements planning (MRP) is a production planning, scheduling, and inventory control system used to manage manufacturing processes. Most MRP systems are software-based, while it is possible to conduct MRP by hand as well.

Benefits of MRP

- All the documents like purchase order, production order get ready as per required time.
- All information is ready on the screen at any time, which is duly updated.
- Making changes manually in Master Schedule is difficult task; this is done by MRP easily and accurately.
- It prepares the reports related to inventory status, production outputs, latest sales figures.
- MRP calculates and maintains an optimum-manufacturing plan, which will reduce cash flow and increase profitability.
- Reduced inventory levels
- Reduced shortage of components
- Reduced overtime on shop floor and offices
- Improved shipping schedule
- Improved production schedule
- Improved calculation of material requirements
- Better manpower planning on shop floor
- Reduction in lead time
- Less scrap and rework

B) Factors affecting Package Design

1. The type of product that is to be packaged. If the product is delicate, it may require more packaging in order to protect the product from damage.
2. The cost of the product. If the product is costly then it makes economical sense to protect the product with a higher amount of packaging so that the goods are not damaged.
3. The amount of handling the product has to go through. If there is a lot of handling is to be done then the product should be packaged properly for protection.
4. Packaging should be such that it should be facilitate handling.
5. Its ability to be reused
6. Its ability to be disposed.

Q4 *Technology used in Warehouses

1. Barcodes
2. Radio Frequency Identification or RFID
3. Scanning Devices
4. Lighting
5. Warehousing Management Systems (WMS)
6. Dock Door Scheduling Software
7. Electronic Data Interchange (EDI)
8. Enterprise Resource Planning

Q5 <u>Selective Inventory Control Techniques</u>

In selective Inventory control techniques focus should be on the most important items in inventory in order to reduce their inventory levels.

The various Inventory Control Techniques are

- ABC Analysis
- VED Analysis
- HML Analysis
- SDE Analysis
- FSN Analysis
- GOLF Analysis
- Re-order Level

Q5 a) Necessity of Inventory

1. Smoothing out irregularities in supply
2. Dealing with uncertainty of demand
3. Buying or producing in batches
4. To meet seasonal demand
5. To take quantity discount
6. To maintain continuity in production process
7. Stock built up for Scale of economy

b) <u>Methods of Controlling Stock Levels</u>

There are several methods for controlling stock, all designed to provide an efficient system for deciding what, when and how much to order.

Just In Time (JIT)
Re-order lead time
Economic Order Quantity
Batch control
First in, first out

c) <u>ABC Analysis</u>

This technique divides inventory into three categories A, B & C based on their annual consumption value. This method is a means of categorizing inventory items according to the potential amount to be controlled.

<u>Procedure of ABC Analysis</u>

- 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.

d) Centralised Warehouse:

Centralizing warehousing is a system where a retailer or its supplier maintains a single, central warehouse versus several facilities spread out to cover a territory.

Benefits:

- It improves operating efficiency and inventory control is felt easier and effective.
- There is no need to carry large stock and there are no dangers of stock outs resulting in low level inventories.
- Transport facilities are optimally used as routing and scheduling becomes handy.

- The firm is better placed to meet the demand fluctuations from different market segments at relatively short notice. .

Drawbacks:

- It results in loss of customer service due to delays are caused.
- It results in heavy transport costs unless each delivery is sizeable as the carrier has to cover long distance.

e) Warehouse workforce design and development

It includes:

1. Retention as it relates to safety and ergonomics: People want to feel safe in their work environment. Job tasks need to be configured in a way that minimize potential hazards and injury

2. Staffing, work standards and incentives: Develop attainable production standards. Provide incentives to encourage employees to shoot beyond the minimum standard

3. Manager-Operator Ratio: Employees per supervisor is a critical ratio. Too many and the supervisor loses effectiveness, too few and supervision becomes expensive.12-20 employees per supervisor is a manageable target

4. Production Standards

- o Holding people to the standards and paying just above market rates
- o results in greater individual productivity and lower headcount,
- o resulting in large cost savings.
- o Weed out under/non-performers
- o Competitive pay leads to better and more productive candidates