**Materials Management-Unit-II Stores**

**Definition of Stores:**

Store keeping involves “to receive materials, to protect them, while is the storage from damage & unauthorized renewal to issue the materials in the right quantities, the right time, to the right place and to provide there services promptly and at least cost.

**Meaning of Stores:**

The term store in general manner is a place (opened & closed) where the goods, inventories, stocks, spares, drugs, surgical instruments, dietaries etc are kept for meeting day to day activities periodic works and so on.

**Importance of Stores:**

- Receiving materials ordered by purchased department
- Informing indenting department regarding the arrival of the material
- Inspection of materials
- Preparation of goods receipts (GRs) for approved material.
- Entry of materials into stores ledger.
- Storage and preservation of materials
- Issue of materials against authorized indents.
- Bill passing of materials received
- Entry of issued materials into ledger.
- Physical safe custody of materials.
- Raising purchase requisition for inventory items.

**Types of Stores:**

The hospital stores can be divided into two broad categories.

1. Consumable Stores → This store are those which can be used only once.
2. Non-consumable Stores → are those which can be used again and again.

**Planning of hospital stores:**

Hospital stores can be planned according to the nature of store.

**Medical and drug stores:**

The medical and drug stores consists of emergency drugs, special drugs, medical gases and chemicals, etc.

**Surgical stores:**

These stores have bandages, gauges, sutures, instruments, equipments, rubber goods, glass items, cotton and general surgical items.

**General stores:**

The items of general stores are cleansing materials like soap and detergents, enamel wares, ward and general furniture, small electric items.
Linen stores:

Linen stores include textiles, synthetic fabric, woolen articles and furnishings.

Stationary Stores:

All the stationary items, including medical forms and papers for medical documentation, etc., are available in stationary stores.

Dietary stores:

Raw materials like vegetables and fruits, tinned items, dry rations like atta and rice, etc., are dealt by dietary stores.

Engineering and Maintenance stores:

These consist of spare parts of civil, electrical, mechanical and electronic items, etc.

Layout of Stores

The efficiency of storekeeping depends upon how and in what way the materials management is planned.

Meaning of stores layout:

Stores layout is an effort to average materials other parts and other services within a predesigned building ensuring study, smooth the environmental flow of materials.

Definition:

Aims of stores layout:

The following are the aims of a good layout:

- Maximum utilization of the available space
- Greater efficiency of the stores depot
- Easy accessibility to all materials
- Maximum security of all materials
- Proper maintenance of records
- Greater economy and use of lesser time in receipt
- Minimum of spoilage, damage, and other kinds of losses.

Types of stores layout:

1. **Straight through flow:**

![Diagram of Straight through flow layout](image)
This is the simplest form of layout design. The goods enter through one door and stocked. In straight line, packed line, packed moved in one direction along the length of stores house & move on through the exit. This can be shows the above diagrams.

2. **Element basis:**

In this the stores are stored either on their consumability. Fast moving, medium moving and slow moving are other characteristic such as long life, short life or expandable or non-expandable are required in special temperature such as cold room.

### Location of Stores

**Meaning of store location:**

Stores location concerned with a store should be located at a place where in habitance are interested in the success a material can be issued receive & purchase & profit & cost its economical menu.

Hospital storerooms have normally been found located in areas which are either unusable by other departments or are not suitable for other functions of the hospitals. Basement is one of such areas being use as stores. They are poorly designed even for use as storage facilities with low ceilings, exposed pipes, poor access and flow design.

### Aims of stores location:

The location of stores should be such that it fulfils the following aims:

- To receive and issue materials within least possible time.
- The cost of transportation is economical
- Materials are saved form unnecessary pilferage, theft and fire
- To have strict control over the movement stock
- Unnecessary fatigue and monotony is avoided
- To be easily accessible to all user areas of hospital.

The store building should be close to the area where the materials are required. While selecting a suitable site for a store, due consideration should be given to temperature, humidity and lighting arrangements and also to scope for future expansion of the store.

### Factors influencing location of stores:

These are 2types namely

1. Internal
2. External

1. **Internal stores location:**

- Maintenance of suitable temperature
- Separate place and rooms for storing
- Maintenance proper records
- Enough control
- Proper packaging
- Availability of material handling equipment
- Machinery for early disposal
- Trained & talented store keeper.
2. **External stores location:**
- Enough transport facility
- Favorable climate
- Nearness to the organization
- Attractive & spacious building
- Enough security
- Facility for disposal
- People friendly location

**Stock Routines / Daily activities of stores / steps / procedure of stock or store keeping:**

1. **Receipt System:**
   - Receipt from outside supplementing
   - Planning labour contracts for loading & unloading
   - Reports fro stores inspection
   - Materials issued to production
   - Updating stores document
   - Conception controlled
   - Insurance disposable
   - Transport contract

2. **Physical System:**
   - Match with valve & quantity
   - Physical verification
   - Rechecking the receipt
   - Find the storage
   - Material department & stores section

3. **Stocking / storing practices:**
   - Stock near than testing laboratories at inspect outfits
   - Accept the material after inspection in each stage
   - Reject the material if it is fails in one stage
   - Return to the supplier.
4. **Issue control:**

   - Issue
     - Conception department
     - Outside supplier for processing & conversion.
   - Check the content given in bills of materials
   - Equalizing the requirement & conception.

**Supply & Replacement of stock:**

1. Waste management
2. Salvaging
3. Reclamation
4. Review

1. **Waste management:**
   
   All non metabolic scrap is called waste. Paper corrugated containers, oils bags, plastics, rubber wood etc. it can be managed by chemical reaction and other process.

2. **Salvaging:**
   
   Recovering or saving, condemned, discarded or abandoned materials, equipment or property in order to obtain useful parts is called salvaging. It can be also mean the saving of material for further utilization. The materials thus saved are called salvaged material.

3. **Reclamation:**
   
   This involves the bringing back to their original serviceable condition, equipment, warn out parts etc. A typical example is retrading a type or metalising a worn out spare and bringing it back to its original specification.

4. **Review:**

   In most organization, some degree of obsolescence or surplus is inevitable. It is particularly acute in factories making product where the design changes frequently and also in organization such as transport undertaking or the armed force, where rapid technical development is a frequent phenomenon and large quantities of spares.

**Stores audit**

**Meaning & Definition of Auditing:**

Auditing is concerned with verification of accounting & financial record with a view to determining their accuracy & reliability.

According to Institute of Chattered Accountance of India (ICAI), “Auditing is a systemic & independent examination of data statements, records, operation & performance of an enterprise for its stated purpose in any auditing situation. The auditor preserves & recognizes them proposition before him for examination collects evidence, evaluate same formulation is a judgment which is communicated through his audit report.”
**Purpose of auditing:**
- To prevent frauds & errors
- To maintain accuracy & clear documents
- To maintain clear record about stores position & status.
- Clear record for issue & purchase
- Requirement of material & purchase department.
- Acting as an evidence for supplied & inspection department.

**Stores Auditing:**

Stores auditing is a process of verification, valuation & formulating the stores recorded translation is a systemic manner here the auditor verifies stock returns issued purchase records, bills of materials etc. by finishing this statement the auditor given a report. These are known as stores auditing.

All the newly received stores from the firms, after placement of order, should kept separately till their inspection is carried out. In no circumstances these will be merged with the regular stocks.

A standing committee should be constituted for carrying out the inspection at the hospital level.

On receipt of any store, these would be thoroughly checked and inspected with a view to ascertaining the quantity, quality and correctness of the stores received and also to know the breakages.

In case where supply is in bulk, it may not be feasible to carry out a 100 percent check of the stores. Here checking of stores based on random selection can be carried out. In case of any doubt on the random checking, entire consignment should be subjected to physical verification.

Injectables and life saving drugs at Medical stores depot level should normally be accepted only after testing. At the hospital level where requirements may be urgent, the item may be accepted on the post lab test basis or under a guarantee/warranty certificate.

The following points are to be kept in mind while auditing the drugs:

- The supplies are as per specification quoted in supply order.
- Packing schedules are as specified in supply order and challan
- Shelf life of items should be adequate.
- The supplies have been made within the date of delivery (D.O.D)
- The supplies and containers have been stamped.

In case of non-expendable items, inspection should be carried out with reference to the specification/catalogue/approved samples or sealed samples in stock/sample rooms.

All items found in order should immediately be entered on the inspection note, and adjustment of items should be completed promptly after that.

Items are not approved should be rejected after recording adequate reasons for such rejections. Necessary action for replacement and lifting of the rejected stores by the firm should be taken.
Stock Verification

Stock verification should be done half-yearly by the Head of the department concerned or once a year by an officer nominated by the Head of the organization. It is advisable to carry out surprises stock verification of the few potentially pilferage items every now and then.

**Definition:**

Stock verification may be defined as the process of physical conditioning, weighting or measuring the stock of material. Ex. Health care service materials.

**Needs / purpose / benefits / advantages of stock verification:**

- To verify the stock physically against them quantity shown in the ledges.
- To identify which repair and control
- To disclose the possibility of fraud, theft, loss etc.,
- As a necessary against spoilage, damage, obsolescence & error.

**Methods of Stock Verification**

The hospitals carry out stock certification by any of the following methods:

1. **Annual Inventory Method:**
   
   In this method verification is usually done at the close of the financial year. Verification should be completed within 2 weeks and report submitted to the Head of the institution.

2. **The Continuous Method:**

   The inventories are divided into twelve equal parts and one part checked every month. This method has the advantage that the store room operations are not required to be shut down during the stock verification.

**Verification Report:**

Verification report should be examined by the purchase officer and submitted to the Head of the institution/hospital with his remarks and recommendations for his orders.

**Steps / procedure of stock verification:**

Identifying the member, location and sub stores  
↓
Sealing stores and sub stores  
↓
Double with seal after physical verification over  
↓
No issue or receipt during verification  
↓
Complete the ledger postings and entries  
↓
Unexplained signature, discrepancy should be noted  
↓
Findings and suggestion of the committee
Control of pilferage

Pilferage: Meaning

In general, pilferage refers to theft or misleading of goods & spare by the employees or the person related or unrelated to the organization engaged in taking away the goods without permission or knowledge of officials who are responsible for the organization or department.

Control of pilferage:

1. **Proper Record keeping:**
   
   This is the method by which the store keeper maintenance records for each and every transaction. Through this he will be able understand the correct inflow & out flow goods & control pilferage to large extent.

2. **On the spot inspection:**
   
   In this way store manager make surprise inspection to the store to make sure that all items are the right place if he finds any inadequately the level of stocks be can enquire it right than.

3. **Adoption of latest technology:**
   
   Here the organization adopts latest technology in order to defect the pilferage, frauds. For example, it closed circuit camera will capture all the activities happening with in the stores. They are other high hand sophisticated methods to detect all fraudulent activities control

4. **Control of errors:**
   
   Here the management should have make all efforts should to minimize the level of errors with respective input & output of stock storage, preservation etc.

5. **Proper storage:**
   
   Storage of all items should be in a transparent manner so that incase of loss the goods lost should come under the notice of the store manager immediately.

6. **Close assessment of personnel’s:**
   
   Here the personnel working in the organization should be asset and cross checked at the end of the day to ensure the particular person is not involved in any pilferage activity.

7. **Proper security:**
   
   It is a most essential requirement of store keeping. If the security arrangement are made without any loopholes. The chances of any misappropriation will remain impossible.

8. **Systemic layout & location:**
   
   This means that the building and the location in which the items are stored should be in a secured environment.
Unit-III Inventory Control

Inventory control is a tool of management which is used to maintain an economic minimum investment in materials and products for the purpose of obtaining a maximum financial return.

In the Inventory control system, control is exercised by fixing a minimum and maximum stock level for each item. An item is reordered in such a way that the stock level, at any time, never goes beyond the minimum level fixed for it. Similarly, the quantity to be reordered is so adjusted that the stock does not exceed its maximum level. Thus, the system answers the two fundamental questions—when to reorder and how much to order.

Objectives of Inventory Control:

- To reduce the financial investments in inventories.
- To minimize idle time by avoiding stockouts and shortages of essential medical and surgical items.
- To avoid losses from inventory obsolescence.
- To improve quantity of care in hospitals.

What is Inventory?

Inventory is the sum total and costs of all supplies, official and non-official, wherever they may be stored, that have not yet been used.

Principle of Inventory Control:

The main principle of inventory control is that items for which annual consumption is high, orders are placed frequently so that the inventory level is as low as possible. For items whose annual consumption is not high, sufficient stocks are maintained and orders placed less frequently.

For proper control of inventories, the following terms should be understood properly:

- Lead time
- Buffer stock (Safety stock or reserve stock)
- Optimum safety stock
- Economic Ordering Quantity (EOQ) System
- ABC analysis
- VED analysis

Lead time:

Lead time is the average duration of time in days between the placing of order and the receipt of materials. When determining the quantity of any item to be ordered we have to take into consideration this ‘Lead Time’ so that orders could be placed at a time when the existing stocks are sufficient for the needs of the hospital during the lead time.
The lead time to procure any item can be divided into two parts, namely:

1. Internal lead time
2. External lead time

1. **Internal lead time:**

   Internal lead time is the time required for the organizational formalities to be completed.

2. **External lead time:**

   External lead time is the time taken in placement of order and receipt of goods.

**Total lead time:**

The total lead time can be computed by working out the time taken in internal and external procurement processes.

\[
\text{Internal lead time (ILT)} + \text{External lead time (ELT)} + \text{Internal lead time (ILT)}
\]

- Requisition order
- Placement of order and
- Taking unit in stock
- Receipt of goods

It is a common belief that external lead time should be controlled and reduced, but in actual practice the internal lead time constitutes a considerable part of total lead time and offers ample scope for reduction. The internal lead time is within the purview of the administration. The external lead time cannot be avoided but it can be prevented for exceeding the stipulated time by:

- Timely reminders and follow up;
- Judicious expending and maintaining good relations with the suppliers;
- Penalty for delayed supplies.

**Buffer stock (Safety stock or Reserve stock):**

Buffer stock is the quantity of stock set apart as a safeguard against the variations in demand and procurement period. This quantity of item can be used only at the time of emergency for unforeseen demands. It is calculated by multiplying the difference between maximum and average consumption rate per day by the lead time for the item.

**Reorder level:**

This term is used to denote the stock level at which fresh order has to be placed. This is equal to the average consumption per day multiplied by the lead time plus the buffer stock. At the time of ordering when the stock reaches the reorder level we will assure that the chances of ‘Stockout’ are practically nil.

**Optimum Safety stock:**

If the safety stock maintained is inadequately low, the inventory carrying charges on the safety stock would be low but stockouts will be frequently experienced and stockout costs would be very high. Hence it calls for inventory costs to arrive at an optimum safety stock. Stockouts may affect the functioning of the hospital in the following ways:
Quality of patient care is affected adversely
Patient satisfaction
Emergency purchase of stores at high cost
Extra transportation charges
Overloading of machines or men.

**Economic Ordering Quantity (EOQ) System**

This is the fixed quantity of material for which order is to be placed each item. In the cyclic system, it is the requirement of review period and lead time plus buffer stock minus stock in hand. In the Two-bin system, it is calculated by using a formula which takes into consideration the annual demand (A) for the item, the ordering cost per order (S), unit cost of item required (C) and carrying cost per rupees of inventory per year (I). The formula is:

\[ Q = \frac{2AS}{IC} \]

Once the order quantity is known, the frequency for placing the order can be calculated by dividing the annual consumption with the order quantity.

**Advantages:**

- Each item of the store can be procured in the most economical quantity, hence called economic ordering quantity system.
- The item is purchased only when it is required to be purchased.
- Positive control can easily be exercised to maintain inventory investment at the desired level.

**Disadvantages:**

This system functions correctly only if each of the items exhibits reasonably stable usage and lead time. When these factors change significantly, new order quantity and new order point is required to be determined and in such cases, the system becomes extremely cumbersome to operate.

**ABC Analysis**

ABC stands for ‘Always Better Control’. The intention is to control the best, then better and, lastly the good. ABC analysis is the analysis of stores on cost criteria. By analysis of the total cost of various inventories it has been found that inventories can be divided into three groups as A, B, and C. the analysis has revealed that 10 percent of items of inventory attribute to nearly 70 percent of the value of the inventory, 20 percent of the items attribute to 20 percent of the value of the inventory, and 70 percent of item of inventory will be of low value and attribute only 10 percent of the value of the inventory.

Based on ABC analysis, an average pattern of percentage of item and percentage of their respective rupee values can be worked out as follows:
<table>
<thead>
<tr>
<th>Item</th>
<th>Percentage of items</th>
<th>Percentage of rupee value</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘A’ items</td>
<td>10</td>
<td>70</td>
</tr>
<tr>
<td>‘B’ items</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>‘C’ items</td>
<td>70</td>
<td>10</td>
</tr>
</tbody>
</table>

It has been seen that a large number of items consume only a small percentage of resources and vice versa. ‘A’ items represent high cost centre, ‘B’ items represent intermediate cost centre, and ‘C’ items are low cost centres. So far as inventory control is concerned, the following guidelines help in keeping the system optimum:

‘A’ items:
- Tight control should be exercised.
- Rigid estimates of requirements should be maintained.
- Strict and close watch should be kept.
- Safety stocks should be low.
- Management of items should be done at top management.
- Exact cost of individual items should be counted.

‘B’ items:
- Moderate control should be exercised.
- Purchase should be based on exact requirement
- Reasonably strict watch and control should be kept.
- Safety stocks should be moderate.
- Management should be done at middle level.

‘C’ items:
- Ordinary control measure should be exercised
- Purchase should be based on usage estimates.
- Controls exercises may be done by storekeeper
- Safety stocks should be high
- Management should be done at lower levels.

From the above, it is observed that ‘A’ class items receive strict control and ‘B’ class items receive moderate control from overstock and stockout points of view, and ‘C’ class items are not subjected too much control or attention.

**VED Analysis**

This analysis is based on the critically of the items in relation to the functioning of the hospital. The items can be classified into Vital (V), Essential (E), and Desirable (D) items.

‘V’ items:

These are vital items without which the hospital cannot perform its functions, that is, patient care. These items should have more safety stocks to ensure a higher degree of safety. These items should be available at all times, and they should be controlled by the top management.
‘E’ items:

These are essential items without which the hospital can function for a short period but which may affect the quality of patient care to a limited extent. These items can be controlled by middle-level managers.

‘D’ items:

These are desirable items, the non-availability of which for a considerable period may not affect the functioning of the hospital. Such items can be controlled at the lower management level.

An example of the coupling matrix model for equipment between critically and cost is shown in figure.

<table>
<thead>
<tr>
<th></th>
<th>V</th>
<th>E</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Defibrillator 1</td>
<td>X-Ray machine 2</td>
<td>Air-contains 3</td>
</tr>
<tr>
<td>M</td>
<td>Ventilator 4</td>
<td>Electric cutlery 5</td>
<td>Ultrasonic wash machine 6</td>
</tr>
<tr>
<td>L</td>
<td>Oxygen Regulator 7</td>
<td>Patient Trolley 8</td>
<td>Electric BP Apparatus 9</td>
</tr>
</tbody>
</table>

Cell 1 contains Vital and high cost items like defibrillator. It must be noted that a material manager has to comprehensively supervise category 1 items since an item may be a low cost one but critical for patient care e.g. oxygen regulator.

**Just in Time**

A concept developed by the Japanese in which required materials are delivered by the original supplier to the location where they are utilized and at the time they are needed.

**Definition:**

Just in time manufacturing is defined in many ways, but the most popular is the elimination of all waste and continuous improvement of productivity. Waste means anything other than the minimum amount of equipment, parts, space, material and worker’s time absolutely necessary to add value to the product. This means there should be no surplus, there should be no safety stocks and lead times should be minimal; ‘if you can’t use it now, don’t make it now’.
The long term result of eliminating waste is a cost efficient, quality-oriented, fast response to customer needs such as organization has a huge competitive advantage in the marketplace.

**Just in time environment**

Many elements are characteristic of a JIT environment. They may not all exist in a particular manufacturing situation but it general they provide some principles to help in the development of a JIT system. These can be grouped under the following headings:

1. Flow manufacturing
2. Process flexibility
3. Total quality management
4. Total productive maintenance
5. Uninterrupted flow
6. Continuous process improvement
7. Supplier partnership
8. Total employee involvement

**Techniques of JIT:**

The philosophy and techniques of JIT manufacturing discussed in this chapter are related to how process and methods lies with manufacturing and industrial engineering. Manufacturing planning and control is responsible for managing the flow of material and work through the manufacturing process, not designing the process. However, manufacturing planning and control is governed by and must work with the manufacturing environment.

1. **Manufacturing planning and control**
   - Forecasting
   - Master planning
   - Material requirements planning
   - Capacity management
   - Production activity control
   - Purchasing

2. **Process design**
   - Flow manufacturing
   - Process flexibility
   - Total quality management
   - Uninterrupted flow
   - Total employee involvement
   - Supplier partnership

**Scientific Techniques**

1. Feedback loop
2. Time series analysis
3. Value analysis
4. Queuing theory
5. PERT and CPM
6. Statistical quality control
7. Work study
8. Cost analysis
9. MBO
10. Quality circles
11. MAPs.

1. **Feedback loop:**

   The hospital, in one way can be desired as a collection of functional service units. Each of the units performs some specialized function. The departmental organizational structure of units, such as nursing, dietetics, radiology, laundries etc. are in fact built in this manner. In a typical acute hospital there may be more than thirty such functional units. The functions of the units vary widely and these may range from removal of waste and garbage to very specialized clinical functions. Never the less from the point of view of the hospital manager each of these units can represent a basic feedback loop or can provide result expected information or goal achievement results. Each unit has a manager or a group of supervisors.

2. **Time Series Analysis:**

   In the context of economic and business researchers, we may obtain quite often data relating to some time period concerning a given phenomenon. Such data is labeled as ‘Time Series’. More clearly it can be stated that series of successive observations of the given phenomenon over a period of time are referred to as time series.

3. **Value Analysis:**

   According to Miles, ‘the pioneer in value analysis is implemented by the use of a specific set of techniques, a body of knowledge and a group of learned skills’.

   Value is one of the most used words and has several meanings. From materials view point value of an item may be thought of as composed of: (i) the functions required of the item (ii) features which the user usually the patient wants and is willing to pay for it.

4. **Queuing Theory:**

   A queuing system can be described as composed of patient arriving for service, waiting for service if it is not immediate and if having waited for service learning the system after being served.

   The study of a problem would take into account:
   a. The arrival pattern: regularly or randomly varying
   b. The no of queues: single or multiple
   c. The queue discipline: FCFS or any other
   d. The no of service points: single or multiple.

5. **PERT and CPM:**

   A time-event network analysis system in which the various events in a program of projects are identified with the planned time established for each is called programme evaluation review technique (PERT) or Critical Path Method (CPM). It application is sequential scheduling of problems, where certain activities cannot be started until others have been completed. Building contracted and massive developmental projects for hospital are the most common example.
6. **Statistical Quality Control:**

   It is the application of statistical techniques to which determine how far the product conforms to the standards of quality and precision and to what extent its quality deviates from the standard quality. The purpose of statistical quality control is to discover and correct only those forces which are responsible for variations outside the stable pattern.

7. **Work Study:**

   Work study is a management tool to achieve higher productive efficiency of an organization. It is concerned primarily with human manual work, more efficiency with the efficient design of such work and with the establishments of standards of performance.

   International labour organization, ‘work study’ as the technique of method study and work measurement employed to ensure the best possible use of human and material resources in carrying out a specified activity.

8. **Cost analysis:**

   A large part of management decision deals with alternatives differing in both the amounts of capital and operating expenses. To assess the value impact calculation of expenses and cost are essential. Cost analysis is a systematic pattern of analysis, which will aid in reducing cost in the selection of alternatives and to gain the maximum benefit from a given level of expenditures.

9. **MBO (Management By Objectives):**

   MBO is process where by the superior and the subordinate managers of an organization. Jointly identify its common goals, define each individual major areas of responsibility in terms of the results expected of him/her, and use these measures & guides for operating the unit and assessing the contributions of each of its members.

10. **Quality Circles:**

    Quality circle is a people-building philosophy capable of providing astonishing results. Quality circles is a small group of people doing similar or related work who meet regularly to identify, analyze and solve quality, production, cost reduction, safety and other problems in their work area leading to improvement in their performance and enrichment of their work life.

11. **MAPs:**

    The organization ability can be improved by the use of management problem solving methods (MAPs). The problem solving case study approach involving actual or contingency situations is suitable for all management levels.

**Inventory Model**

One of the basic problems or inventory management is to find out the order quantity so that it is most economical from over all operational points of view. Here the problem lies in minimizing the two conflicting cost, i.e, ordering cost and inventory carries cost. Inventory model help to find out the order quantity which minimized the total costs (sum of ordering costs and inventory carrying costs). Inventory model are classified in to two categories;
1. Deterministic Model
2. Probabilistic Model

Both of them are just an elements or parts of inventory model. First deterministic model assumes certainty i.e, by analyzing and referring the main dates, events, past records, situation, sales and demand, consumption etc. by analyzing above factors it predicts the future. But incase probabilistic model all are assumed by probability and chances, but for this analysis no need of keeping long or more information details to analyze. Just an experience personnel and a person from statistics and maths can able to tell the future requirement. Any way both of the model follows the same period and quantity system. The details of there are as follows:

(i) Fixed order quantity System
(ii) The working of the system
(iii) Fixed periodic review system

(i) **Fixed Order quantity system:**

This is also called Q-system. In this system, the order quantity is fixed and ordering time varies according to the fluctuations in demand.

**Characteristics of this system:**

(i) Re-order quantity is fixed and normally it equals economic order quantity (EOQ)
(ii) Depending upon the demand, the time interval of ordering varies.
(iii) Replenishment action is initiated when stock level falls to Re-order Level (ROL)
(iv) Safety stock is maintained to account for increase in demand during leastime.

(ii) **Working of the system:**

To begin with the stock from the first bin is consumed first. The emptying of first bin indicated than the stock has reached ROL and the replenishment action is initiated. The quantity in then second bin is thus consumed during the replenishment period. This system reduces the work involved record keeping.

(iii) **Fixed periodic review system:**

It is also called fixed ordering system or P system. This system has a fixed ordering interval but the size of the order quantity may vary with changes in demand. In this system, the inventory position is verified at a prefixed interval (weekly/monthly/quarterly) then depending upon the situation, replenishment action is taken.

**Characteristics of this System:**

(i) Order interval is fixed for individual item or group of items.
(ii) Stock is received at periodic intervals and quantity which will bring the inventory to maximum level is ordered.