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S.Y.B.Com
(CBCS 2019 Pattern)

1st – Semester

Subject – Cost & Works Accounting - I

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***Topic 4 – Inventory
Control***

- **Significance** –

No cost accounting system can become effective without proper and efficient control of materials. This is so because quite often material is the largest single element of cost and as such an efficient system of material control leads to a significant economy in the total cost of production.

- **Meaning and Definition** –

Material control is defined as “safeguarding of company’s property in the form of materials by a proper system of recording and also to maintain them at the optimum level considering operating requirements and financial resources of the business”. This wide definition embraces control over purchases, storage and consumption of materials and determining the optimum level for each item of inventory. The system of control should be comprehensive enough to cover the flow of materials starting from the point when someone make a request for the purchase up to the stage when materials are consumed and their costs compiled and assembled in cost sheets.

- **Objectives of Material Control** –

1. **No understocking** –

Understocking leads to materials running out of stock at some time or the other. Shortages of materials may arise at the time when they are urgently needed and production then be delayed. Delay or stoppage in production due to non-availability of materials is very costly as it may result in loss of profits. Material control system ensures that there is no shortage of materials.

2. **No Overstocking** –

Investment in materials must be kept as low as possible, considering the production requirements and the financial resources of the business. Overstocking of materials unnecessarily locks up capital and causes high storage costs, thus, adversely affecting profits.

3. **Minimum Wastage** –

Proper storage conditions must be provided to different types of materials. Losses of materials may occur due to deterioration, obsolescence, theft, evaporation etc. All efforts should be made to keep these losses at the minimum.

4. Economy in Purchasing –

The purchasing of material is a highly specialised function. By purchasing materials at the most favourable prices, the efficient purchaser is able to make a valuable contribution to the success of a business.

5. Proper Quality of Materials –

While purchasing materials, due consideration should also be given to the quality. It is no use purchasing materials of inferior quality or of very superior quality. For each type of product there is a particular quality of materials which is needed and that quality alone should be purchased.

6. Information about Materials –

Not only that materials should be available as and when required, but also there should be a system to give complete and up-to-date accounting information about the availability of materials. Sometimes inadequate information about the availability of materials may cause new purchases be made of materials already in stock.

7. Material reports to management –

The material control system should be so designed so as to serve the purpose of accurate and up-to-date reports to management about purchase, consumption and stocks of materials.

• Essentials Requirements or Principles of Inventory Control –

1. There should be proper coordination and cooperation between various departments dealing in materials; viz., purchasing department, stores department, receiving and inspecting department, accounting department etc.
2. There should be central purchasing department under the control of a competent and expert purchase manager.
3. There should be proper classification and codification of materials
4. Material requirements should be properly planned

5. The perpetual inventory system should be operated so that up-to-date information is available about the quantity of material in stock
6. Adequate records should be introduced to control material during production and the quantities manufactured for stock
7. The storage of all materials should be well-planned subject to adequate safeguarding and supervision
8. The various stock levels like minimum, maximum, etc. should be fixed for each item of material
9. Purchase of materials should be controlled through budgets
10. An efficient system of internal audit and internal check should be operated so that all transactions involving materials are checked by reliable and independent persons
11. There should be regular reporting to management regarding purchases, issues and stock of materials. Special reports should be prepared for obsolete items, spoilage, returns to suppliers etc.

- **Techniques of Inventory Control –**

Various techniques commonly used for inventory control are listed below:

1. ABC Technique
2. Minimum, maximum and re-order levels
3. Economic order quantity (EOQ)
4. Proper purchase procedure
5. Proper storage of materials
6. Inventory turnover ratio
7. Perpetual inventory system
8. Fixation of material cost standards
9. Preparation of material budgets

- **ABC Technique –**

ABC technique is a value-based system of material control. In this technique of selective control, materials are analysed according to their value so that costly and more valuable materials are given greater attention and care. All items of materials are classified according to their value, i.e., high, medium and low values, which are known as A, B and

C items respectively. ABC technique is sometimes called 'Always Better Control Method'. It is also known as 'Control by Importance and Exception'. It is based on the concept of Selective Inventory Management' i.e., concentrate your efforts where the results are maximised.

'A' Items – These are high value items which may consist of only a small percentage of the total items handled. On account of their high cost, these materials should be under the tightest control and the responsibility of the most experienced personnel.

'B' Items – these are medium value materials which should be under the normal control procedure.

'C' Items – these are low value materials which may represent a very large number of items. These materials should be under the simple and economic methods of control.

▪ **Advantages –**

1. Closer and stricter control can be exercised on those items which represent large amounts of capital invested
2. Investment in inventory is regulated and funds can be utilised in the best possible way
3. Economy in stock carrying costs
4. It helps in maintaining enough safety stock for 'C' category items
5. Selective control helps in maintaining high stock turnover rate

➤ **Stock Levels –**

One of the major objectives of a system of material control is to ensure that there is no 'understocking' and 'overstocking'. A scientific approach to achieve this objective is to adopt a system of stock levels. These levels are maximum level, minimum level, re-order level and re-order quantity. By taking action on the basis of these levels, each item of material will automatically be held within appropriate limits of control. These levels are not fixed permanently but can be changed as and when required.

a) **Maximum Level –**

The maximum stock level is the level above which stocks should not normally be allowed to rise. It is the maximum quantity of a given material that may be held in store. The following factors are considered while fixing this level.

- i) Rate of consumption of the material
- ii) Storage space available
- iii) Amount of capital needed and available
- iv) Risk of obsolescence and deterioration
- v) Cost of storage
- vi) Insurance costs
- vii) Bulk purchases of seasonal materials
- viii) Re-order quantity of the materials

Formula :

Maximum level = Re-order level + Re-order quantity – (Minimum consumption x minimum re-order period)

b) Minimum Level –

Minimum level is that level below which stock should not normally be allowed to fall. In case any item of material falls below this level, there is a danger of stoppage in production and top priority should be given to the purchase of new materials. In setting this level, the following factors must be taken into account:

- i) Rate of consumption of material
- ii) Time required to obtain delivery of the new materials
- iii) Re-order level

Formula :

Minimum level = Re-order level – (Normal consumption x Normal re-order period)

c) Re-order Level –

This is that level of material at which a new order for materials is placed. It is at this level that purchase requisition is made out. This level is above minimum level but below maximum level. It is set after a consideration of the following factors:

- i) Rate of consumption of material
- ii) Minimum level

- iii) Lead time or delivery time i.e., the time normally taken from the time of raising purchase requisition to receipt of materials.

Formula :

Re-order level = (Maximum consumption x Maximum re-order period)

Danger Level –

This is a level at which normal issues of materials are stopped and urgent action is taken for purchase of materials so that production is not interrupted due to shortage of materials.

Formula :

Danger level = Average or normal consumption x Maximum re-order period for emergency purchases

Average Stock Level –

Average stock level is calculated by the following formula:

$$\text{Average stock level} = \frac{\text{Minimum Level} + \text{Maximum Level}}{2}$$

Or

Average stock level = Minimum Level + 1/2 (Re-order quantity)

➤ **Economic Order Quantity (EOQ) or Re-order Quantity –**

EOQ or re-order quantity is the quantity to be ordered whenever materials are to be purchased. Re-order quantity is sometimes known as EOQ because it is the quantity which is most economic to order. In other words, EOQ is the size of the order which gives maximum economy in purchasing any material and ultimately contributes towards maintaining the material at the optimum level and at the minimum cost. It equates the cost of ordering with the cost of storage of materials.

Ordering Cost – it mainly includes cost of stationary, salaries of those engaged in receiving and inspecting, salaries of those engaged in preparing the purchase orders, etc.

Cost of storage or Cost of carrying Inventory – this includes the cost of storekeeping (stationary, salaries, rent, material handling cost etc.), interest on capital locked up in stores, the incidence of insurance cost, risk of obsolescence, deterioration and wastage of materials, evaporation, etc.

- **Assumptions underlying EOQ**

- Ordering costs and carrying costs are known and they are fixed per unit
- Anticipated usage is known
- Cost per unit is known and it is constant
- Quantity ordered is delivered immediately
- It assumes that demand is uniform
- It is applied without considering the possibility of a falling demand and can lead to a high value of inventory obsolescence

Formula:

$$EOQ = \sqrt{\frac{2 A O}{C}}$$

Where,

EOQ = Economic Order Quantity

A = Annual Consumption or Usage in units or in Value

O = Ordering and Receiving Cost per order

C = Cost of Carrying one unit of inventory for one year

➤ **Perpetual and Periodic Inventory Control –**

Usually there are two methods of Inventory Control viz. Perpetual Inventory Control and Periodic Inventory Control Method.

1. Periodic Inventory Control Method –

Under this method, the entire stock is verified at periodic intervals, usually once a year at the close of the accounting period, so as to value the closing stock for preparation of final accounts. If it is chosen to verify the stocks at two or more periodic intervals, the verification is arranged during the slack season. For periodic verification the factory work is stopped for the required number of days and the verification has to be done urgently. The closer of the works even for a day is quite a costly affair and so this system is not favoured by the large business houses. Secondly, the risk of loss or theft of stores is not minimised due to long interval between the two checking periods. Hence periodic stock taking must be systematically organised well in advance to minimise the production holdups.

- **Procedure –**

Before starting the process of stock verification, the following procedure should be adopted:

1. The store-keeper must ensure that the bin-card postings are all completed upto date
2. To see that the bin-cards are kept alongside the corresponding items
3. On the dates fixed for verification of the stock, verification personnel should verify the stock of each item
4. Post the same in the bin-card and prepare the relevant stock verification sheets
5. The stock verification sheets, as and when completed, are sent to the stores accounting section who carry out the necessary adjustments in the store's ledger.
6. In each bin a tag is kept, on which the stock verification personnel record the following data viz. the description of the item, location code and the quantity of stock
7. These tags are sent to stores accounting section who compares these, first with the bin-card to arrive at the surplus or deficit and then with the stores ledger to make the necessary adjustments therein

- **Advantages –**

1. It facilitates valuation of stores for exhibition in the final accounts
2. Periodic verification is however, good for item which do not find place in perpetual i.e. continuous inventory records e.g. work-in-progress, components and consumable stores at site, capital assets, loose tools, and spare parts lying in the departments or workshops, measuring devices, and tools in the custody of inspection staff etc.
3. The correctness of the description in the bin-card can be checked up
4. Irregularities in store-keeping are automatically checked
5. Mix-up of more than one item in one bin or keeping of the same stock at two places, are also brought out

- **Disadvantages –**

1. If stock is verified at frequent intervals of less than a year, such a course may become expensive
2. The need for stoppage of activities even for small periods for the purpose of stock verification makes the method more costly

3. No regular or special staff is employed for stock taking, inexperienced persons are appointed at short notice. The result of this is that the stock-taking becomes inaccurate
4. Periodic stock verification can have more mistakes

2. Perpetual Inventory Control Method –

Meaning –

The systematic maintenance or regular stock records is usually termed as Perpetual Inventory Control Method. This method of stock taking implies a complete, systematic and updated account of each item of stock both on records and physical goods. Under this method stocks are checked regularly throughout the year in a systematic manner. The verification plan and stock taking programmes are so chalked out and the actual work of counting, weighing, measuring and listing of items are so well distributed that the entire stock is accurately checked in routine way without duplication throughout the year. Thus, perpetual inventory control method or continuous stock taking system tries to overcome the serious disadvantage of periodic inventory method.

Definition –

The CIMA, London defines Perpetual Inventory Method as, “a system of records maintained by the controlling department, which reflects the physical movement of stock and their current balance”.

Perpetual Inventory Method consists of the following three components –

1. Bin Cards i.e. Quantitative Perpetual Inventory
2. Stores Ledger i.e. Quantity and Value Perpetual Inventory
3. Continuous Stock Taking i.e. Physical Perpetual Inventory

- **BIN CARD –**

A store keeper often maintains a record of quantity of each material, such record being known as Bin Card. The Bin Cards show the details of receipt and issues of materials and the balance in stock at any time. This record is of immense help to the storekeeper in controlling the stock position. A Bin Card is attached to the bin, drawer or any other container in which material is stored. An entry is made at the time of each receipt or issue and the new balance in stock is calculated. All these entries of receipts and issues are supported by documents such as goods received note, material returned note, stores requisition note etc.

As a storekeeper usually has to initiate purchase requisitions, the maximum and minimum stock levels are shown on the Bin Card along with ordering level and ordering quantity. This information helps the storekeeper in preparing the necessary purchase requisition when the stock reaches ordering level.

Usefulness –

1. It is used for entering the receipts, issues and the closing balance of each item of stores
2. It is used for controlling the stock by watching the maximum and minimum levels stated on the card
3. It helps in the requisitioning the materials when the re-order level is reached
4. Since the EOQ is also stated on the card, it enables the store keeper as to how much quantity he has to requisition
5. Location code of the material helps in identifying the location of required material
6. It helps in the implementation of the perpetual inventory system as it contains the quantitative record of receipts, issues and closing balance of each item of store
7. It provides an independent check on the stores ledger

• Stores Ledger –

This record gives the same information regarding stores as bin card and in addition it gives the money values of materials. Separate ledger folio are maintained in it for each item of material. The ledger sheets may be in loose leaf form or separate bindings may be used for each type of material. The stores ledger is maintained in the cost accounting department and is one of the basic records for material accounting in a cost system. There are mainly three sections on this ledger i.e. receipts, issues and balance, each of these with appropriate sub-divisions showing date, quantity, unit price and total cost. Two additional sections are usually included; materials on order and materials reserved. The on order column prevents placing of duplicate orders and reserve column indicates the materials reserved for a specific job order.

The entries in the receipts and issues columns are made from the same documents which are used for posting in bin card i.e. Goods Received Note and Stores Requisition Note, etc.

• **Difference between Bin Card and Stores Ledger –**

Bin Card	Stores Ledger
1. It is a record of quantities only	1. It is a record of both quantities and values
2. It is kept inside the stores	2. It is kept in the cost accounting department
3. Posted before the transactions takes place	3. Posted after the transaction takes place
4. It is maintained by the storekeeper	4. It is maintained by the cost accountant
5. Each transaction is individually posted	5. Transactions are summarised and posted monthly
6. Balance in bin card is compared with the physical quantity as well as store ledger	6. Balance in stores ledger card is compared with bin card quantity
7. No need of reconciliation with general ledger as it contains quantities only	7. Total value of all these cards is to be reconciled with the general ledger

• **Advantages of Perpetual Inventory Control Method –**

1. The system helps in avoiding the long and costly work of physical checking of all the stocks at the end of the year
2. It also avoids disruption in production which arises in case of periodic stock taking at the end of each year
3. As stock figures are readily available at all times, the profit and loss account and balance sheet can be easily prepared at interim periods
4. The system acts as a moral check on the staff of the stores department to work honestly and to keep up-to-date records
5. A system of integral check remains in operation all the time
6. Discrepancies are readily discovered and rectified. This gives an opportunity for preventing a recurrence in future
7. The system helps in keeping the stocks within the limits decided upon by the management, so that excessive working capital is not sunk in the stocks
8. A detailed and reliable check on stores is obtained

In spite of number of advantages of perpetual inventory control method, it suffers from the following **drawbacks**

1. Unless the bin cards and the stores ledger are kept UpToDate effective control cannot be exercised and the actual work of continuous stock taking is hampered simultaneously

2. The necessity for an agreement between bin cards and stores ledger balances further creates the problem

➤ **Inventory Turnover Ratio –**

Inventory Turnover Ratio is considered as one of the most important value-based technique of inventory control. Usually, this ratio is calculated basically to find out the actual rate of material consumption and the speed at which materials are replaced. More the consumption of material, more is the frequency of replacement and hence turnover of inventory is very high. Inventory turnover ratio clearly indicates as to how many times on an average, a material is rotated during a particular year and hence, brings out the pattern of stock holdings and efficiency in material control. This ratio hence considered as an important indicator of efficiency of inventory management and control. Higher ratio indicates maximum efficiency of inventory management and lower ratio indicates minimum efficiency.

Formula –

- 1) Inventory Turnover in Times

$$= \frac{\text{Cost of materials consumed during the period}}{\text{Cost of average stock held during the period}}$$

- 2) Inventory Turnover in Times

$$= \frac{\text{Number of Days during the period}}{\text{Stock Turnover Ratio}}$$

Where,

$$\text{Average stock} = \frac{\text{Opening stock} + \text{Closing Stock}}{2}$$

$$\text{Inventory Performance Index} = \frac{\text{Actual stock turnover ratio}}{\text{Standard stock turnover ratio}} \times 100$$

Indications –

1. Low Ratio –

Indicates slow moving stock, accumulation of obsolete stock, carrying of too much stock, i.e. those items of stores which are not issued frequently, their issue is irregular and at large intervals. It leads to the disadvantages arising out of over-stocking.

2. High Ratio -

Indicates fast moving stock and less investment in stock i.e. those items of stock which are issued frequently and their issue is very regular.

3. Zero Ratio –

Means the item of stock had not been used at all during the period and hence it should be disposed off immediately, otherwise the quality and value of such item will be deteriorated.