



Indian Accounting Association

**Subject: Cost and Management
Accounting**

Topic

Material Cost Management

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Cost Accounting

Material Cost Management

LEARNING OBJECTIVES OF THIS UNIT:

After going through this unit, you will be able to

- understand the concept of material and material cost.
- state the objectives of material control.
- describe the process of material purchase.
- understand the techniques of material/inventory control.
- understand the importance of storage of materials.
- describe various stores records.
- understand the need for ascertaining the cost of issue and closing stock.
- explain different methods of pricing the issue of materials.
- describe the treatments of material losses.

1. INTRODUCTION:

In any business organisation, material cost constitutes a big portion of the cost of a product. As huge investments are made for materials, therefore there is need for proper planning, control and management of material costs. It is essential to have proper accounting for materials. Material control is a managerial activity that administers how the inventory employed in the production process is procured, handled and utilized. The very purpose of material control is to ensure smooth and uninterrupted flow of production. The purchase department has to follow a structured process for purchasing the materials. Proper control should be exercised on materials to avoid wastages.

The business organisations need to ensure uninterrupted supply of materials to the production and service departments. Proper storage of materials is essential to avoid pilferage, theft and deterioration. Materials are regularly issued to the production and other departments. It is also required to find out the price of the materials issued. Various methods are followed for this purpose such as LIFO, FIFO, weighted average, simple average, base stock method, etc. The methods to be used in the organization, depends on its own circumstances. The various classifications of material losses and its accounting treatment are essential for materials management.

In this unit, we shall discuss about the concept of material cost, material purchase, inventory control techniques, storage, store records, methods of pricing the issue of materials and treatment of material losses.

2. MATERIALS:

Material: It is the physical commodity that is consumed in the process of production. Materials which are consumed in any manufacturing process may be classified into two categories: Direct material and Indirect material.

Material cost is treated as direct if the material:

- can be easily identified with a specific unit.
- varies directly with the volume of production.
- becomes the part of the finished product.

The direct materials are the basic raw materials like cloth in garments, timber in furniture and milk in ice cream, etc. Primary packing material are also taken as direct materials, such as bottles for water or any liquid. Direct material cost forms a part of prime cost.

Indirect materials have no relationship with the output and they cannot be easily identified with the finished product. For example, stores used for maintaining machines such as lubricant oil, cotton, consumable stores etc. It is a part of overhead cost.

3. MATERIAL CONTROL:

Cost of material constitutes major portion of the cost of production. Therefore, proper planning and control of material cost is required. Purchase of material, its storage and issue are the key areas where proper control should be exercised. Material control is also called as 'Inventory Control' or 'Stores Control'.

Objectives of Material Control:

- Avoid understocking and overstocking:*** By determining the stock level for the materials we can avoid the cost and burden of understocking and overstocking.
- Ensure uninterrupted production:*** Material control helps in smooth production by ensuring the availability of required materials at the right time and at right quantity.
- Efficient purchasing:*** Material control leads to purchase of right quantity of goods at the right price and from the right source.
- Minimum wastage:*** Through material control, wastage can be avoided which are due to poor storage facility, fire, theft, evaporation, etc.

4. ACCOUNTING AND CONTROL OF PURCHASES:

In the words of Accounting author Walter "Scientific purchasing is the procurement by purchase of proper materials, machinery, equipment and supplies or stores used in the manufacture of a product, adopted to marketing in the proper quantity, at the proper time and at the lowest price consistent with the quality desired."

The purchase of materials should be backed by right quality, right quantity, right time, right price, right source of supply and right place of taking delivery. Quality should be expressed in terms of standard specifications and it should be suitable for the purpose for which they

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have been purchased. The ordering quantity is based on three types of cost: purchase cost, ordering cost and carrying cost. The ordering quantity that minimizes the ordering cost and carrying cost is considered as the right quantity. To order the material at the right time, the store keeper must initiate the purchase requisition when the stock reaches the re-order level. The price of the materials should be determined with respect to the quality, quantity, delivery time, after sales services, etc. The supplier should be able to deliver the right quality and quantity of materials at the right time and fair price.

The function of purchasing can be centralized or decentralized. Under centralized system, the purchases are done from one central point and then they are issued to the various departments as and when required. It brings about higher trade discounts and facilitates effective control over purchases. Under decentralized purchasing the materials are purchased by each department on their own. It is also called as localized purchasing. This method is very flexible and is best suited for emergency purchases.

The steps in scientific purchase are:

- i. **Receiving purchase requisitions:** Purchase requisition is a formal request given to the purchase department to purchase the materials. Purchase requisition is also called 'indent for materials'. Purchase requisition is prepared in triplicate for three departments.
 - The original copy is sent to the purchase department.
 - Duplicate is sent to the Production and control Department.
 - Triplicate copy remains with the department that initiates purchase.

The purchase requisition contains the requisition number, date, description, code number, quantity of materials required and signature of three persons, i.e., the person initiating the requisition, the person checking it and the approving authority.

The *Specimen of purchase requisition* is given below:

ABC Pvt. Ltd. Purchase Requisition				
No.		Date:		
Date by which materials are required:				
Sl. No.	Description	Stores Code No.	Quantity Required	Remarks
Requisitioned by..... By..... For Purchase Department reference Supplier..... Officer Date of Delivery		Checked By.....		Approved Purchase

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ii. **Selecting the supplier:** After the purchase requisition is received, the purchase department invites quotations from the suppliers. The following types of tenders are invited from the suppliers:

- **Open Tender:** In this case, tenders are invited through advertisement in journals, newspapers, etc.
- **Limited Tender:** in this case, tenders are invited from limited number of firms on the basis of goodwill or performance of the organizations.
- **Single Tender:** In single tender only one firm is selected.

The tenders are received and the particulars are summarized and tabulated in a comparative statement.

The *specimen of comparative statement* of quotation is as follows:

ABC Pvt. Ltd. Comparative Statement of Quotations						
Tender No....						
Date....						
Name of the material.....						
Sl No.	Name of the Supplier	Quantity	Rate	Terms of Delivery	Time of delivery	Remarks

Price of material, quality and quantity of material, trade discount, credit facility, transportation cost, etc. are some of the factors that needs to be considered before selecting the right supplier.

iii. **Placing the purchase order:** After selecting the supplier, the purchase department prepares purchase order. Purchase order is usually prepared in five copies for the following purposes:

- For the supplier
- For the receiving department
- For the accounting department
- For the initiating department
- Retained in the purchase department

The *Specimen of purchase order* is given below:

ABC Pvt. Ltd Purchase Order	To
--------------------------------	----

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Supplier's Name.....						Order No.	
Address.....							
Date.....							
Dear Sir,							
Your quotation bearing No.... dated.... Has been accepted. Please supply the following materials as per the instructions mentioned herein:							
Sl No.	Description	Quantity	Code No.	Price Rs.	Total Rs.	Delivery date	Remarks
Packing and dispatching instructions.....							
Terms of Payment.....							
Place of Delivery.....							
Discount Allowed.....							
Freight.....						For ABC Pvt	
Ltd.						Purchase Manager	

- iv. **Follow-up of purchase order:** In order to ensure delivery of goods within schedule time, follow up with the supplier is necessary. Any delay must be communicated to the supplier immediately.
- v. **Receiving and inspecting materials:** The inspection department or the storekeeper checks the quality of the goods received. The receiving department checks the copy of the delivery challan and purchase order and then prepares the 'goods received note'. Goods received note is prepared in five copies for:
- Receiving Department
 - Purchase Department
 - The department initiating the purchase requisition
 - Stores Department
 - Accounts Department

The *specimen of goods received note* is as follows:

ABC Pvt. Ltd						
Goods Received Note						
Supplier's Name.....						G.R.
Code....						
Purchase Order No.....						Date...
Item No.	Description	Code	Quantity Ordered	Quantity Received	Amount	Remarks
Received by.....						Inspected

by..... Storekeeper.... Store Ledger Folio.....

- vi. **Checking and passing invoices for payment:** The purchase department checks the invoice with reference to the purchase order and goods received note. If everything is found in order then invoice is passed to the accounts department for payment.

Check your progress:

1. What are the objectives of material control?
2. What is limited tender?
3. What is scientific purchasing?
4. Give the specimen of purchase requisition.
5. Choose the correct option:
 - i. Purchase order is prepared by:

a) Storekeeper	c) Purchase Department
b) Plant engineer	d) Production Manager
 - ii. Purchase order is usually prepared in ____ copies.

a) 2	c) 7
b) 5	d) 10
 - iii. Tender is an:

a) estimation of profit	c) estimation of selling price
b) estimation of cost	d) estimation of units

5. MATERIALS/INVENTORY CONTROL TECHNIQUES:

Materials/Inventories comprise of:

- i) Stock of raw materials
- ii) Stock of work-in-progress
- iii) Stock of finished goods
- iv) Stock of stores and spares

Raw materials are the inventory items that a business organization uses to produce finished goods. Typically, raw materials are commodities such as grain, petroleum, paint, steel, wood, paper, etc. Work in progress is the unfinished goods. It refers to the items that have crossed the stage of raw materials but is not yet a finished product. Finished goods are the items that are ready for sale. Stores and spares refer to the consumables, maintenance and repair supplies.

Inventory control involves proper planning, organising and controlling the purchase, storage and usage of materials. It ensures the availability of good quality and quantity of materials at the required time and at minimum cost.

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The various techniques of inventory control are as follows:

- i) Fixation of Stock Levels
- ii) Economic Order Quantity
- iii) Effective Purchase Procedure
- iv) Stock Verification
- v) Control Ratios
- vi) Selective Control Techniques (ABC analysis, VED analysis, etc.)

(i) Fixation of Stock Levels:

- a) *Reorder Level:*** It is the point at which the storekeeper should initiate the purchase requisition. Reorder level is higher than minimum level and the difference between the minimum level and the reorder level meet the production requirement during the delivery period.

Reorder Level = Maximum Consumption x Maximum Reorder period

or

Reorder Level = Minimum Level + Consumption during the time required to get fresh delivery

- b) *Maximum Level:*** It is the level beyond which stock is normally not kept. It leads to overstocking if the stock rises above the maximum level.

Maximum Level = Reorder Level + Reorder Quantity – (Minimum rate of Consumption x Minimum Reorder Period)

The main objectives of fixing maximum level are to avoid overstocking, to control unnecessary investment in stock and to use working capital in a proper way. Some of the factors that are taken into consideration before fixing the maximum level are rate of consumption, lead time, availability of storage space, cost of maintaining stores, economic order quantity, etc.

- c) *Minimum Level:*** It is the minimum quantity of inventory that should always be maintained in the business organization. Beyond minimum level, the stock should not fall as this will lead to disruption in the flow of production. It is also called as buffer stock.

Minimum Level = Reorder Level – (Normal Rate of Consumption x Normal Delivery Period)

Some of the factors that are considered before fixing minimum stock level are average rate of consumption, lead time, etc.

- d) *Danger level:*** Normally stock should not fall below the minimum level. Danger level is the level below the minimum level. In such case immediate actions are needed to replenish the stock.

- e) *Average Level:*** It is the average quantity of stock held by any organization during a particular period of time. It is the average of maximum and minimum level of stock. It is above minimum level and below maximum level.

$$\text{Average Level} = (\text{Maximum Stock level} + \text{Minimum Stock Level})/2$$

(ii) Economic Order Quantity

Economic Order Quantity is the size of order that gives maximum economy in purchasing the material and storing it. The following factors are considered in determining EOQ:

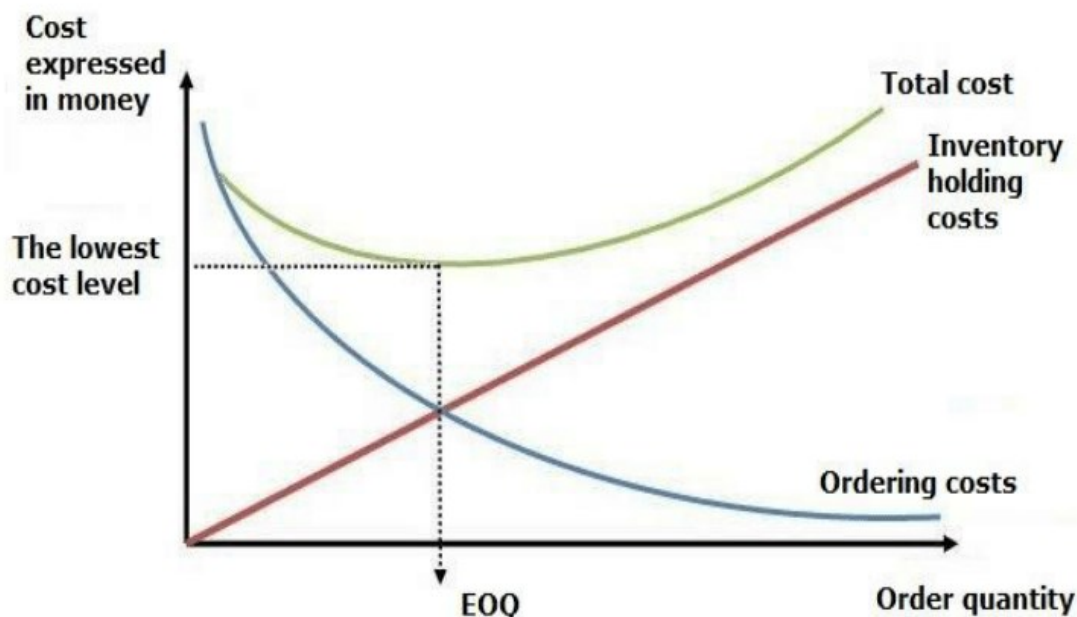
- Cost of material
- Inventory Carrying Cost
- Ordering Cost

Carrying Cost: It refers to the cost of holding the stock. It includes the cost of storage facilities, salaries and wages of stores department, insurance, losses in stores, etc.

Ordering Cost: It refers to the cost incurred every time when an order is placed. It includes the salary of employees of the purchase department, office expenses, administrative expenses, etc.

Figure: 1

Graphical presentation of Economic Order Quantity



In the above figure we can see that carrying cost varies directly with the size of the order whereas the ordering cost varies inversely with the size of the order. The total cost represents the summation of both carrying cost and ordering cost of inventories. The total inventory cost has a minimum point and this point is the EOQ. EOQ is the optimum order that minimizes the total costs of inventory management.

Mathematical Formula for EOQ:

$$EOQ = \sqrt{\frac{2AO}{c}}$$

Here, A = Annual Consumption in unit

O = Ordering Cost per order

C = Carrying Cost per unit

Illustration 1:

Calculate EOQ from the following information:

Consumption of material per annum 10,000 kg

Cost of placing order Rs. 50 and cost per Kg of raw material is Rs. 2.

Storage cost is 8% on average inventory.

Solution:

$$EOQ = \sqrt{\frac{2AO}{c}}$$

A = Annual Consumption in unit = 10,000 units

O = Ordering Cost per order = Rs. 50

C = Carrying Cost per unit = 2 x 8%

$$EOQ = \sqrt{\frac{2 \times 10,000 \times 50}{2 \times 8\%}}$$
$$= 2500 \text{ kg}$$

Illustration 2:

A small manufacturing firm provides the following information in respect of materials.

Cost per unit = Rs. 50

Rate of Consumption

Average: 15 units per day

Maximum: 20 units per day

Annual: 5,000 units

Ordering cost: 20 per order

Carrying cost: 10% of the unit price per annum

Re-order period: 5 to 15 days

Calculate: a) Re-order Level b) Minimum Level c) Maximum Level

Solution:

- a) Reorder Level = Maximum Consumption x Maximum Reorder period
= 20 units x 15 days = 300 units

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b) Minimum Level = Reorder Level – (Normal Rate of Consumption x Normal Delivery Period)

$$= 300 - (15 \text{ units} \times 10 \text{ days}) = 150 \text{ units}$$

c) Maximum Level = Reorder Level + Reorder Quantity – (Minimum rate of Consumption x Minimum Reorder Period)

$$= 300 + 200^* - (10 \times 5) = 450 \text{ units}$$

$$^* \text{Reorder Quantity} = \sqrt{(2 \times 5,000 \times 20) \div (50 \times 10\%)} = 200 \text{ unit.}$$

(iii) **Effective Purchase Procedure:**

It is one of the inventory control techniques. The purchase manager must develop an effective purchase procedure for smooth flow of production. The purchase procedure must vary from industry to industry. The size of the organization, type of raw materials used, the type of finished product, source of supply, terms and condition of purchase are some of the factors that influence the purchase procedure.

(iv) **Stock Verification**

At times, the physical balance of stock does not tally with the book balance. For this reason, the stock verification is needed. The physical balances are determined by stock taking and the book balance are determined from the bin card or the stores ledger. The recorded stock and the actual stock are checked to find the discrepancies. Then proper investigation is done to find the cause of such discrepancies and subsequently corrective measures are taken to curb it.

As regards to inventory system, **Perpetual Inventory System** is widely used. It is also called continuous recording system as a continuous record of receipt and issue of materials is maintained by stores department. Here, all the receipts and issue of materials are recorded simultaneously in Bin Cards and Stores Ledger. Perpetual Inventory System shows the stock in hand in quantity or value or both at any time without physical stock verification.

Physical Stock Verification: The process of physically counting and weighing the stock is referred to as physical stock taking. There can be two ways of physical stock taking, i.e., periodic stock taking and continuous stock taking. Under periodic stock taking, the physical counting of inventory is made at the end of the accounting year. Under continuous stock taking, the verification of stock is done on regular and continuous basis. When perpetual inventory system is supported by continuous physical verification, strict control over materials can be exercised.

The reasons of discrepancy between stock as per record and actual stock position are as follows:

- **Errors:** Errors refers to the wrong balancing, wrong posting, omission of any issue or receipt. This can be rectified by passing the necessary entry in the books.
- **Normal Losses:** This refers to the losses due to unavoidable reasons like evaporation, shrinkage, deterioration in quality due to lapse of time, etc. Normal loss is adjusted by debiting Store Adjustment A/c and crediting Store Ledger Control A/c.

- **Abnormal Losses:** These are the avoidable losses that arises due to strike, lockout, theft, mishandling of inventory, etc. Abnormal loss is adjusted by debiting the Costing profit and loss A/c and crediting the stores ledger A/c.

(v) Inventory Control Ratios

The various ratios to exercise inventory control are as follows:

- Material Turnover Ratio:** It is ratio of the cost of materials consumed during a period to the average cost of inventory during the period. This is expressed in terms of times. Material turnover ratio indicates how many times the investment in average stock has been turned over during the period. Material turnover ratio is also known as stock turnover ratio and inventory turnover ratio.

$$\text{Material Turnover Ratio} = \frac{\text{Cost of materials consumed during the period}}{\text{Average stock of materials held during the period}}$$

$$\text{Average Stock} = (\text{Opening Stock} + \text{Closing Stock})/2$$

Material turnover ratio can be expressed in terms of days. It shows the number of days it takes for the firm to transfer inventories to finished goods. The formula is as follows:

$$\frac{\text{Days during the period}}{\text{Material turnover ratio}}$$

- Productivity Ratio:** It is the ratio of output to input. Higher productivity ratio is an indicator of material cost control. Managers regularly use productivity ratio to measure efficiency and evaluate their business model.

$$\text{Productivity ratio} = \frac{\text{Output}}{\text{Input}}$$

(vi) Selective Control Techniques

ABC Analysis: It is a part of material management which categorises inventory according to three distinct categories. The aim of ABC analysis is to determine the level of control and frequency of review of the items. ABC is based on Pareto Principle which states that vast majority of the result is determined by small percentage of a group.

According to this method of inventory control, inventory is classified into three classes, i.e., A, B and C. Items of high value but small in quantity are classified as “A”, items of moderate value and moderate size are classified as “B” and items of small value and large size are classified as “C”. Category A items require continuous and strict control, category B requires moderate control and category C periodic verification or annual review.

VED Analysis: It is an inventory management technique that categorizes the inventory on three heads: vital, essential and desirable. ‘Vital’ includes the inventory that are necessary for production in an organization. Here, continuous checking and replenishment happens for this stock. ‘Essential’ category refers to the inventory that is next to vital. ‘Desirable’ category of inventory is least important among three and its unavailability may result in minor stoppage in production.

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JIT System of Purchasing: Just in time purchase means purchasing of materials just before their use. In this system, the carrying cost and material handling cost are reduced.

Check your progress:

1. Explain the ABC method of inventory control technique.
2. What is carrying cost?
3. What is reorder level?
4. What is buffer stock?
5. Explain perpetual inventory system.
6. Choose the correct option:
 - i. In order to avoid stoppage of production due to shortage of material:
 - a) minimum stock level is maintained
 - b) maximum stock level is maintained
 - c) reorder level is maintained
 - d) average stock level is maintained.
 - ii. Which is not a type of inventory:
 - a) Work in progress
 - b) Finished goods
 - c) Raw materials
 - d) Plant and machinery
 - iii. Which among the following cost is the expense of storing inventory for a specified period of time?
 - a) Purchasing cost
 - b) Carrying cost
 - c) Financial cost
 - d) Ordering cost

6. STORAGE OF MATERIALS:

Storage of materials refers to the act of storing materials for their safe custody till these are issued to the production and other departments. It involves receiving, storing and issuing of materials. Store is the place where materials are kept. A store keeper maintains various store records for materials management.

Store Records:

Some of the important store records that are kept for different transactions of material are as follows:

- **Bin Card:**

After inspection, materials are stored in different bins. For each bin, a card is maintained where the quantity of receipts, issues and balances are recorded by the storekeeper. This card is called as Bin Card. Separate Bin Card is maintained for each type of material. It is maintained by store keeper.

The *specimen of bin card* is as follows:

ABC Pvt. Ltd.	
Bin Card	
Code No....	Bin No...
Name of Material....	Maximum Stock

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Level...									
Storekeeper....		Minimum Stock							
Level...									
Stores Ledger Folio No...		Reorder Stock							
Level.....									
Date	Receipts			Issues		Balance	Audit		
	G.R.No. *	Quantity y	S.R.No. *	Quantity y	Quantity y	Date	Remarks	Initial	

*G.R. No is the Goods Received Note number and S.R.No. is the Stores Requisition Note number.

Bin card is an important stores record. It helps to keep the stock within the required level and thereby controls the investment in materials. It also guides the storekeeper to issue purchase requisition when the material reaches the reorder level. Bin card shows up-to-date information on the receipts, issues and balances.

- **Stores Ledger:**

Stores Ledger is maintained by the Cost Accounting Department. It is opened for each item of material to record both the quantity and cost of the materials received, issued, returned and in hand. It is usually in loose leaf card and it is maintained to ensure correct stores accounting.

The *specimen of stores ledger* is as follows:

ABC Pvt. Ltd. Stores Ledger											
Code No....											
Name of Material....		Maximum Stock									
Level...											
Location....		Minimum Stock									
Level...											
Bin Card No...		Reorder Stock									
Level.....											
Date	Receipts				Issue				Balance		
	G.R. No.	Quantity	Rate	Amount	S.R.No	Quantity	Rate	Amount	Quantity	Rate	Amount

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Checked By....

Storekeeper.....

- Stores Requisition Note:**

All issue of material is done on the presentation of the Stores Requisition Note. It is a document authorizing the storekeeper to issue the materials.

The *specimen of Stores Requisition Note* is as follows:

ABC Pvt. Ltd Stores Requisition Note					
Job No.				No.....	
Department....				Date....	
To Storekeeper					
Please issue the material stated below:					
Description	Code	Quantity	For Cost Office		Remarks
			Rate	Amount	
Bin Card No..		Authorised By...	Issued By...	Received By....	Priced by...
Stores Ledger					
Folio No..					

- Bill of Material:**

Bill of material is a document stating the detail list of materials that are required for manufacturing a product or for a job or process. When a copy of bill of material is received by the Purchase Department, steps are taken for collection of quotation, selection of supplier and placing of purchase order.

A *specimen of bill of material* is given below:

ABC Pvt. Ltd Bill of Materials						
Job Order No.....				No.....		
				Date.....		
Item No.	Description	Code No.	Quantity		Accounts Office	
			Required	Issued	Rate	Amount
Prepared by (Drawing Officer)		Purchase Deptt ref:			Stock verified	
by.....						
.....		Order Date.....				
Checked by.....		Delivery Date...				

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Storekeeper.....

• **Material Transfer Note:**

When the materials or equipment are transferred from one sub store to another sub store or from one production section to another or from one job to another, the document called Material Transfer Note is prepared.

A *specimen of material transfer note* is given below:

ABC Pvt. Ltd. Material Transfer Note				
From:				
Job No.....				
No...				
Deptt.....				
Date....				
To:				
Job No.....				
No...				
Deptt.....				
Date....				
Reasons of transfer.....				
Description	Code No.	Quantity	For Accounts Office	
			Unit Price	Value
Authorised by.....		Issued by.....		Received
by.....				

Check your progress:

1. Why we need store records?
2. What is stores ledger?
3. What is material transfer note?
4. Explain bill of material.
5. Choose the correct option:
 - iv. Which of the following is not a store record?

a) Bin Card	c) Bill of Material
b) Material Transfer Note	d) Cost Sheet
 - v. Stores Ledger is maintained in:

a) Store Department	c) Accounts Department
b) Cost Accounting department	d) Personnel department
 - vi. Bin Card is maintained by

a) Stores Department	c) Accounts Department
b) Personnel department	d) Cost Accounting Department

- vii. Bin card is a:
- Quantitative as well as value wise records of material received, issued and balance
 - Quantitative record of material received, issued and balance.
 - Value wise record of materials received, issued and balance
 - A record of labour attendance
- viii. Material transfer note:
- Authorises and records the issue of material use
 - Records the return of unused material
 - Records the transfer of materials from one store to another
 - A classified record of materials issues, transfer and returns.

7. PRICING THE ISSUE OF MATERIALS:

Production of goods and services is a continuous process. Raw materials and other indirect materials are issued periodically for the production process. Huge amounts of money are required for the purchase of materials. Proper method should be used for valuing the issue of materials for use in the production of goods or rendering the services. Methods are selected taking into consideration many factors, such as nature of the materials, objectives of pricing, market conditions, method of costing used, policy of the management, etc.

Methods

The various methods used for valuing the issue of materials are as follows:

- Cost Price methods
 - First In First Out (FIFO) method
 - Last In First Out (LIFO) method
 - Specific Price method
 - Base Stock method
- Average Price methods
 - Simple Average method
 - Weighted Average method
- Market Price methods
 - Replacement Price method
 - Realisable Price method
- Standard Price method

7.1.COST PRICE METHODS:

- First in First Out (FIFO)**

Under this method materials received first are issued first. So, the issues are priced on the price of the earliest lot available. As a result, the closing stock is valued at latest purchase price representing the current condition.

Advantages of FIFO method are:

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- i. It is simple to understand and easy to operate.
- ii. Closing stock value represents the current market price.
- iii. This method is suitable when prices are falling as the cost of goods sold will be higher and the closing stock will be lower.
- iv. Material cost shows the actual cost which is charged to the product. So profit or loss doesn't arise here.
- v. Under FIFO method possibility of obsolescence is avoided.

Disadvantages of FIFO method are:

- i. In case of fluctuating prices, this method leads to complex calculations and clerical errors.
- ii. When the prices rise, this method will give low charge to production which will further lead to higher profit and higher tax liability.
- iii. When price change frequently the material charged to different jobs will be different and comparison will be difficult.

Illustration 3:

The following transactions occurred in purchase and issue of a material in an organization during January 2021.

Receipts

Dated	Quantity	Rate per unit
04.01.21	200 units	Rs. 24
10.01.21	150 units	Rs. 23
18.01.21	100 units	Rs. 24
22.01.21	100 units	Rs. 23

Issued

Dated	Quantity
05.01.21	250 units
12.01.21	200 units
25.01.21	250 units

The stock on 1.1.21 was 200 units at the rate of Rs. 25 per unit. Prepare Stores Ledger Account by adopting FIFO method of charging material issued. What is the value of closing stock as on 31.01.21?

Solution:

Stores Ledger Account Under FIFO method

Name:

Code No.

Maximum Level:

Minimum Level:

Ordering Level:

Re-order Quantity:

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Date	Receipts				Issue				Balance		
	G.R.N No	Qty	Rate Rs.	Amount Rs.	Requisition slip No.	Qty	Rate Rs.	Amount Rs.	Qty	Rate Rs.	Amount Rs.
Jan 1	Bal.	200	25	5,000	-	-	-	-	200	25	5,000
Jan 4	b/f	200	24	4,800	-	-	-	-	400	200	5,000
									200	24	4,800
Jan 5		-	-	-		200	25	5,000			
						50	24	1,200	150	24	3,600
Jan 10		150	23	3,450	-	-	-	-	300	150	3,600
									150	23	3,450
Jan 12		-	-	-		150	24	3,600			
						50	23	1,150	100	23	2,300
Jan 18		100	24	2,400	-	-	-	-	200	100	2,300
										24	2,400
Jan 22		100	23	2,300	-	-	-	-	100	23	2,300
									300	100	2,400
										23	2,300
Jan 25		-	-	-		100	23	2,300	100		
						100	24	2,400			
						50	23	1,150	100	23	1,150
									50		
		750		17,950		700		16,800	50		1,150

Value of closing stock as on 31.01.21 was Rs. 1,150.

• Last In First Out (LIFO)

Under LIFO, issues are made out of the latest purchase. In this case the unit cost or price of the latest lot is taken first for issue until all units from this lot are exhausted. After the latest lot is fully issued, the price of the lot immediately preceding the last lot will be used and so on.

Advantages of LIFO method are:

- i. The cost of production reflects the current price as the value of materials are issued to production is at the current prices.
- ii. In this method, complete recovery of material cost is facilitated.
- iii. LIFO is suitable when prices are rising.

Disadvantages of LIFO method are:

- i. In case of fluctuating prices, this method leads to complex calculations and clerical errors.
- ii. Cost of materials charged to different jobs at different times varies, therefore effective comparison cannot be made.

Illustration 4:

The following transactions occurred in purchase and issue of a material in an organization during January 2021.

Receipts

Dated Quantity Rate per unit

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04.01.21	200 units	Rs. 24
10.01.21	150 units	Rs. 23
18.01.21	100 units	Rs. 24
22.01.21	100 units	Rs. 23

Issued

Dated	Quantity
05.01.21	250 units
12.01.21	200 units
25.01.21	250 units

The stock on 1.1.21 was 200 units at the rate of Rs. 25 per unit. Prepare Stores Ledger Account by adopting LIFO method of charging material issued. What is the value of closing stock as on 31.01.21?

Solution:

Stores Ledger Account Under LIFO method

Name:

Code No.

Maximum Level:

Minimum Level:

Ordering Level:

Re-order Quantity:

Date	Receipts				Issue				Balance			
	G.R.N No	Qty	Rate Rs.	Amount Rs.	Requisition slip No.	Qty	Rate Rs.	Amount Rs.	Qty	Rate Rs.	Amount Rs.	
Jan 1	Bal.	200	25	5,000	-	-	-	-	200	25	5,000	
Jan 4	b/f	200	24	4,800	-	-	-	-	400	200	25	5,000
									200	24	4,800	
Jan 5		-	-	-		200	24	4,800				
						50	25	1,250	150	25	3,750	
Jan 10		150	23	3,450	-	-	-	-	300	150	25	3,750
									150	23	3,450	
Jan 12		-	-	-		150	23	3,450				
						50	25	1,250	100	25	2,500	
Jan 18		100	24	2,400	-	-	-	-	200	100	25	2,500
										24	2,400	
Jan 22		100	23	2,300	-	-	-	-	100	25	2,500	
									300	100	24	2,400
										23	2,300	
Jan 25		-	-	-		100	23	2,300	100			
						100	24	2,400				
						50	25	1,250	100	25	1,250	
									50			
		750		17,950		700		16,700	50		1,250	

Value of closing stock as on 31.01.21 was Rs. 1,250.

- **Specific Price method:**

In this method materials are purchased separately for a specific job or contract and kept in stores. When materials are issued for jobs or contracts, they are priced at the exact cost as per the respective accounts maintained separately. This method is suitable for job or contract costing. This is also suitable for purchase and issue of non-standardised items that are required to meet customer specification.

- **Base Stock Method:**

In every organization minimum quantity of stock is always held in stores. This minimum stock is called safety stock or base stock. The base stock is used in case of emergency situation. Minimum stock is created out of the first lot, so it is valued at the cost price of the first lot of materials. The remaining stock is issued at a price similar to FIFO or LIFO method. Thus, the advantages and disadvantages of both the method will be applicable to base stock method.

7.2.AVERAGE PRICE METHODS:

- **Simple Average Method**

In this case materials are issued at the average price of different lots of materials purchased. It uses average price for pricing the issue of materials until either the old lot is exhausted or a new lot is purchased where a new average price will be calculated.

$$\text{Issue price} = \frac{\text{Total of unit purchase prices of different lots in stock}}{\text{Number of purchases}}$$

Example:

Opening stock 500 units @ Rs. 50

Purchased 800 units @ Rs. 50

Purchased 1,500 units @ Rs. 56

The simple average price = $50+50+56/3 = \text{Rs. } 52$ per unit

- **Weighted Average Price Method**

Weighted average price is a price obtained by dividing the total cost of materials in the stock by the total quantity of materials in the stock. It is based on the assumption that each issue consists of a due proportion of the earlier lots. It averages out the effect of price fluctuations.

$$\text{Weighted Average Price} = \frac{\text{Value of materials in stock}}{\text{Total quantity in stock}}$$

Example:

Opening stock 250 units @ Rs. 52

Purchased 200 units @ Rs. 45

Purchased 300 units @ Rs. 54

The weighted average price = $(250 \times 52 + 200 \times 45 + 300 \times 54) / (250 + 200 + 300)$

= Rs. 50.93

7.3.MARKET PRICE METHODS

- **Replacement Price Method:**

Under this method, materials are issued at a price at which they can be replaced. The use of this method presupposes the determination of replacement cost of materials each time when an issue is likely to be made. This method is suitable in periods of rising prices because the cost of material considered in cost of production enables replacement of the same quantity of materials at the increased price. It reflects the current price levels.

- **Realisable Price Method**

Realisable price is the price at which similar materials can be sold in the market. In this method, materials are issued at realisable price as on the date of issue of material. This method has similar advantages like Replacement Price Method.

7.4.STANDARD PRICE METHOD

Materials are issued at standard price. Standard price is a pre-determined price fixed for a particular period taking into consideration the factors affecting it.

Standard cost for each material can be fixed after taking into consideration the following factors:

- Current prices
- Expected change in prices due to market conditions
- Discount available
- Transport and warehousing expenses

This method is simple to apply as all issues are priced at the same standard price. But it is difficult to fix the standard price when prices fluctuate frequently.

8. TREATMENT OF MATERIAL LOSSES:

Material losses can be in the form of waste, scrap, spoilage and defective. Problem of material losses arises in almost all manufacturing concerns. The types of material losses are discussed below:

- i. **Wastage:**

Wastage refers to the discarded materials that have no value. The various factors that cause loss are loss due to evaporation, shrinkage, destruction during production. In many organisations, waste is inevitable. Waste may be normal waste or abnormal waste.

Normal waste is unavoidable. It is due to the nature of the raw material. For example: evaporation of chemicals, shrinkage of silks, waste during loading and unloading, etc. Any loss of material due to abnormal conditions is referred to as abnormal waste. For example: loss due to theft, breakdown of machinery, etc.

Accounting Treatment: The loss of normal waste is borne by the good units produced. The value of abnormal wastage is charged to the costing profit and loss account.

- ii. **Scrap:**

Scrap is the residue of the raw material which is incidental to the production process. For example: wood dust in saw mill, cotton waste in cotton mill, etc. It is discarded material and has low disposal value.

Any loss of material due to abnormal conditions is referred to as abnormal waste. For example: loss due to theft, breakdown of machinery, etc.

Accounting Treatment: When the value of scrap is very low and it cannot be identified with specific job, then it is credited to profit and loss account as miscellaneous receipts. If the scrap is significant and identifiable with particular job or work order then it should be credited to the specific job or work in progress for determining the actual cost of the work order or job. In case of continuous production process, it is difficult to quantify the scrap for a specific job or work order. In that case, the value of scrap is credited to production overhead in order to reduce the overhead absorption rate.

iii. **Spoilage:**

Spoilage refers to the units produced that are rejected as they do not meet the quality standards. They are the rejected or damaged units. For example, broken glass in glass industry, etc. These units are disposed without further work as they cannot be repaired. Spoilage can be of two types, normal spoilage and abnormal spoilage.

Accounting Treatment: Normal spoilage arises under efficient operating conditions and it is within the standard limit. Normal spoilage is charged to good units. Abnormal spoilage refers to rejection in work in progress that exceeds the standard normal spoilage. It is not expected to arise under efficient operating conditions. Abnormal spoilage is charged to costing profit and loss account.

iv. **Defectives:**

Defectives are the units that do not meet the quality standards. These units can be reprocessed and rectified by incurring additional expenditure of material, labour and overhead expenses. If the defects can be completely rectified then these are sold like good units. But if after rectification, some defects still exist then the units are sold at reduced rates. These units are called second quality products.

Accounting Treatment: Where the defectives are identifiable with a specific job then the rectification cost is charged to that job. When the defective production cannot be identified with a specific job then the rectification cost is treated as a part of production overhead. When the defectives are due to fault of particular department then the rectification cost is charged to that department. If the defective production is due to abnormal reasons, then the rectification cost is charged to costing profit and loss account.

Check your progress:

9. What is FIFO?
10. What is scrap? Discuss its treatment in accounts.
11. State the advantages of LIFO method.

12. What are the various average price methods used in issue of materials?
13. Choose the correct option:
- i. Which one out of the following is not an inventory valuation method?
 - a) FIFO
 - b) LIFO
 - c) Weighted Average
 - d) EOQ
 - ii. In case of rising price (inflation), LIFO will:
 - a) Provide lowest value of closing stock and profit
 - b) Provide highest value of closing stock and profit
 - c) Provide highest value of closing stock but lowest value of profit
 - d) Provide lowest value of closing stock and highest value of profit
 - iii. If raw materials prices are inflated, which of the following stock valuation methods will the lowest gross profit.
 - a) FIFO
 - b) LIFO
 - c) Replacement cost
 - d) Simple Average
 - iv. A method of pricing of material where a minimum quantity of stock is always kept in stores is known as:
 - a) Minimum stock method
 - b) Base stock method
 - c) Low Stock method
 - d) Weighted average method
 - v. In case of falling prices, the most suitable method of pricing of issue of material is
 - a) Base stock
 - b) LIFO
 - c) FIFO
 - d) Simple average method

9. LET US SUMUP:

The term 'materials' refers to all commodities purchased by a business organisation for manufacturing of a product or rendering a service. For costing purposes, materials can be classified into direct materials and indirect materials. Direct material cost is taken for calculation of prime cost whereas indirect material cost is treated as part of production overhead. It helps in exercising proper control over material cost.

Material control involves proper planning, organising and controlling the purchase, storage and usage of materials. It helps to achieve the objective of efficiency and avoiding wastages.

Scientific purchasing of materials involves the procurement of proper materials, and supplies or stores used in the manufacture of a product or rendering of a service. It helps in ensuring the flow of materials in the proper quantity, at the proper time and at the lowest price consistent with the quality desired.

The various techniques of inventory control are as follows: Fixation of Stock Levels; Economic Order Quantity; Effective Purchase Procedure; Stock Verification; Control Ratios and Selective Control Techniques (ABC analysis, VED analysis, etc.)

Storage of materials involves receiving, storing and issuing of materials. Store is the place where materials are kept. A store keeper maintains various store records for materials management such as bin card, stores ledger, bill of materials etc.

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Various methods are used for valuing the issue of materials. The important methods used for valuing the issue of materials are: First In First Out (FIFO) method; Last In First Out (LIFO) method; Specific Price method; Base Stock method; Simple Average method; Weighted Average method; Replacement Price method; Realisable Price method and Standard Price method.

Material losses can be in the form of waste, scrap, spoilage and defective. Problem of material losses arises in almost all manufacturing concerns. Proper accounting and control is necessary for the material losses.

10. KEY WORDS:

Bill of material: It is a document stating the detailed list of materials that are required for manufacturing a product or for a job or process.

Lead time: It is the time required to receive materials from point of placing order.

Carrying Cost: It refers to the cost of holding the stock.

Ordering Cost: It refers to the cost that is incurred every time an order is placed.

Material Turnover Ratio: It is ratio of the cost of materials consumed during a period to the average cost of inventory during the period.

Bin Card: For each bin, a bin card is maintained where all the receipts, issues and balances are recorded by the storekeeper.

Stores Ledger: Stores Ledger is maintained by the Cost Accounting Department for each item of material in the store to record both the quantity and cost of materials received and issued.

Bill of Material: Bill of material is a document stating the detail list of materials that are required for manufacturing a product or for a job or process.

Material Transfer Note: When the materials or equipment are transferred from one sub store to another sub store or from one production section to another or from one job to another, the document called Material Transfer Note is prepared.

Wastage: It refers to the discarded materials that have no value.

Defectives: Defectives are the units that do not meet the quality standards. These units can be reprocessed and rectified by incurring additional expenditure of material, labour and overhead expenses.

Scrap: It is the residue of the raw material which is incidental to the production process.

Spoilage: It refers to the units produced that are rejected as they do not meet the quality standards. They are the rejected or damaged units.

First in First Out (FIFO): Under this method materials received first are issued first.

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Last in First Out (LIFO): Under LIFO, issues are made out of the latest purchase.

11. ANSWERS TO CHECK YOUR PROGRESS:

5. i. c, ii. b, iii. b

11. i. a, ii. d, iii. b

16. i. d; ii. b; iii. a; iv. b; v. c

21. i. d; ii. a; iii. b; iv. b; v. c

12. TERMINAL QUESTIONS/EXERCISES:

1. What are the steps involved in purchase procedure?
2. What is purchase order? Give its specimen.
3. State the various inventory control techniques.
4. From the following information calculate the
 - a) Re-order level
 - b) Minimum Stock level
 - c) Maximum Stock level
 - d) Average Stock levelMinimum Consumption = 300 units per day
Maximum Consumption = 500 units per day
Normal Consumption = 400 units per day
Re-order Quantity = 4,500 units
Re-order period = 10-15 days
Normal re-order period = 12 days
(a. 7,500 units, b. 2,700 units, c. 9,000 units, d. 5,850 units)
5. Calculate EOQ from the following information:
Annual demand = 600 units
Carrying cost = 20% of unit price
Cost per unit = Rs. 3
Ordering cost per order = Rs. 80
(400 units)
6. A publishing house purchases 2,000 units of a particular item per year at a unit cost of Rs. 20, the ordering cost per order is Rs. 50 and the inventory carrying cost is 25%. Find the Economic Order Quantity.
(200 units)
7. Explain the various store records maintained by any organization.
8. What is FIFO method of pricing of issues of materials? Explain with an example.
9. What is weighted average method of pricing the issue of raw materials to the production process? Give an illustration.
10. Write a note on standard price method.
11. Distinguish between Bin Card and Stores Ledger.
12. From the following particulars prepare stores ledger account using FIFO method for the month of July, 2021:

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July 01 Opening balance 1000 units at Rs. 50 each
July 05 Received 1200 units at Rs. 48 each
July 07 Issued 1500 units
July 09 Issued 400 units
July 15 Received 1000 units at Rs. 49 each
July 20 Issued 500 units
July 25 Issued 500 units
July 28 Received 1000 units at Rs. 52 each
July 30 Issued 1000 units

13. In a factory, the following purchases and issues were made during the month of August, 2021. Prepare the store ledger account under FIFO method and LIFO method.

Date	Purchases (units)	Rate(Rs.)	Issues(units)
Aug 01	1000	10	-
Aug 10	1200	10.5	-
Aug 15	-	-	1500
Aug 25	800	10.6	-
Aug 30	-	-	700

Is there any difference in the value of closing stock between these methods?

14. Prepare stores ledger account under weighted average price method from the following information:

Date	Particulars	Quantity	Rate (Rs.)
June 1	Purchase	1000 kg	10
June 9	Purchase	600 kg	10.40
June 14	Issue	1100 kg	
June 19	Purchase	800 kg	10.8
June 30	Issue	600 kg	

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