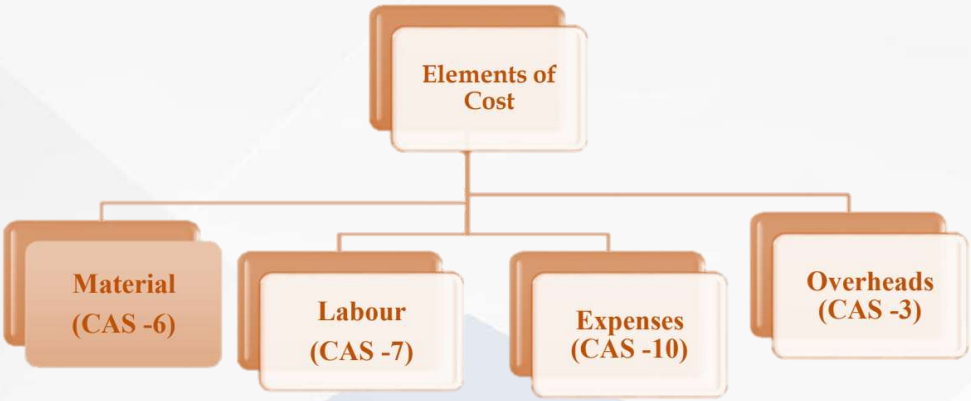
2. Material Cost

COST ASCERTAINMENT - ELEMENTS OF COST

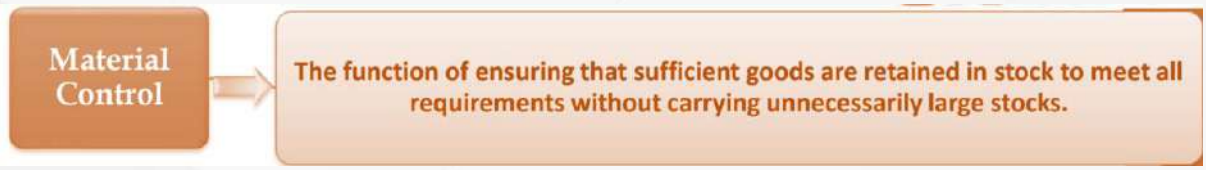


Material Cost

Importance of proper recording and control of material

- Quality of final product depends on quality of input.
- Cost of the final product directly related to cost of materials used
- avoid production interruptions, an adequate level of stock of materials should be maintained
- Cost of Stock holding and stock-out
- Wastage and other losses
- Regular information about on availability and utilization of materials

Material Control



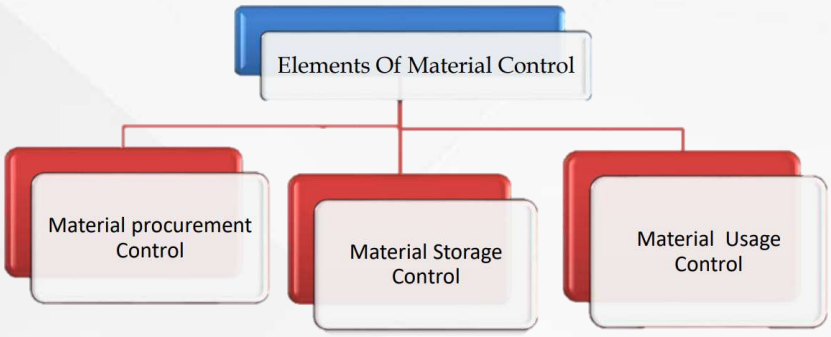
Objectives of Material control system

- ***Minimizing interruption in production process***
- ***Optimization of Material Cost***
- ***Reduction in Wastages***
- ***Adequate Information***
- ***Completion of order in time***

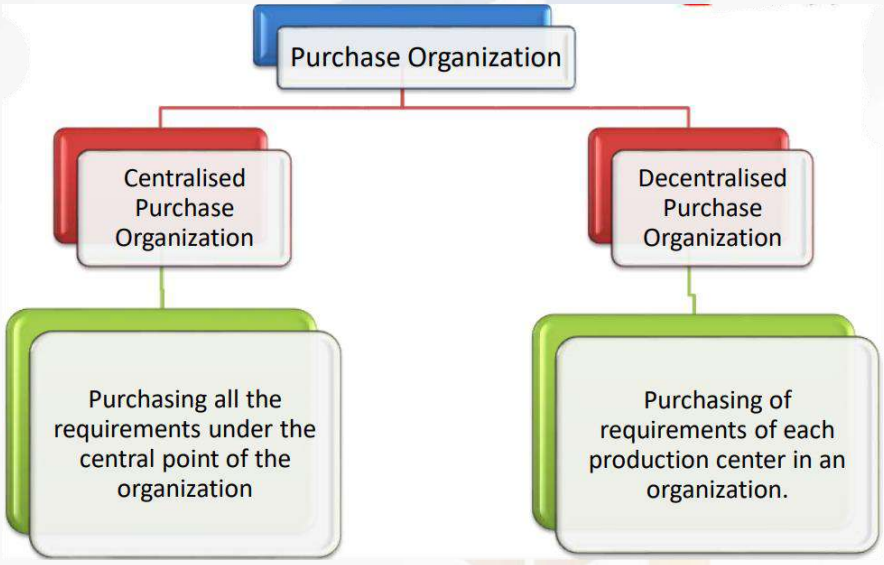
Requirements of Material Control System

- Proper co-ordination of all departments
- Use of standard forms and documents in all the stages of control
- Classification, coordination, standardization and simplification of materials
- Planning of requirement of material
- Efficient purchase organization
- Budgetary control of purchases
- Planned storage of materials
- Appropriate records to control issues and utilization of stores in production
- Efficient system of Internal Audit and Internal Checks
- System of reporting to management regarding material purchase, storage and utilization

Elements Of Material Control



Purchase Organization



Merits of a centralized & De-merits of decentralized purchase organization	Merits of a decentralized & De-merits of centralized purchase organization
Trade discount, Economies of transport	Long time to place a purchase order in
Specialized purchasing officer for highly efficient purchases functions	Branches at different places cannot take advantage of localized purchasing
Effective control can be exercised & duplication of purchase may be avoided	Chances of miscommunication between the branch result in wrong purchase of material
Standardization of materials, storage facilities.....etc	High initial costs for setup of separate purchasing department.
Cooperation between the financial and purchasing departments	Replacement of a defective item may take long time resulting in strain on smooth production flow

Material control document

- Bill of material
- Material requisition note
- Purchase Requisition
- Purchase Order
- Goods Received cum Inspection Note
- Material Transfer Note
- Material Return Note

Bill of material

- It is a detailed list specifying the standard quantities and qualities of materials and components required for producing a product or carrying out of any job

Material requisition note

- Material Requisition is a document issued by a department in charge requesting the Storekeeper to issue certain materials to a job or standing order number

Purchase Requisition

- Purchases Requisition is a request made to the Purchase Department to procure materials of given description and of the required quality and quantity within a specified period.

Purchase Order

- Purchase Order (PO) is a request made in writing to selected supplier to deliver goods of requisite quality, quantity, at the specified prices, terms and conditions agreed upon.

Goods Received cum Inspection Note

- After receipt of materials along with relevant documents or/ and invoice, receiving department (store dept.) arrange to inspect the materials for its conformity with purchase order. After satisfactory inspection, materials are received and Goods Received cum ins ection Note is issued.

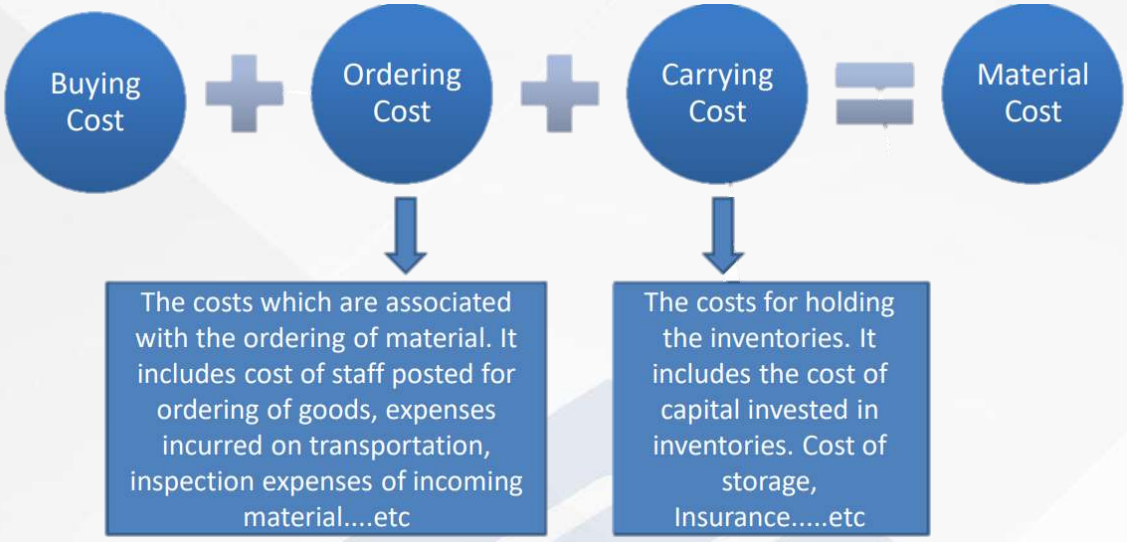
Material Transfer Note

- Material Transfer Note is a document used for transferring the material from one department to other department or one site to other site or one job to other job.

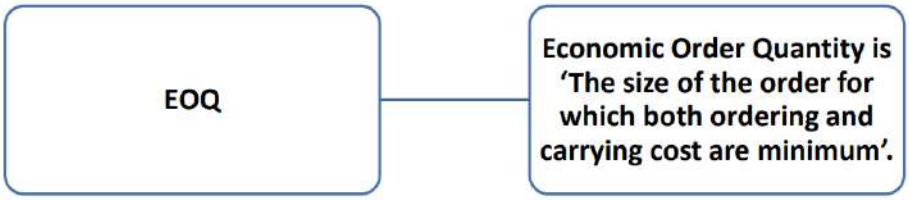
Material Return Note

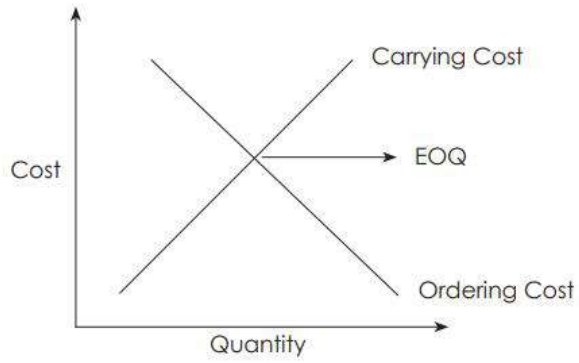
- At times materials have to be returned to the suppliers after these are received in the factory, if the material is returned after the entry into the Goods Received Note, a document called "Material Return Note" will be prepared simultaneously to exclude the quantity and value of the returned material from the stores

Material Cost



EOQ





Economic Order Quantity (EOQ) - Formula

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

A = Annual demand /Consumption
O = Ordering Cost per order
C = Carrying Cost per unit per annum.

Illustration

1.

Calculate the Economic Order Quantity from the following information. Also state the number of orders to be placed in a year.

Consumption of materials p.a : 10,000 kg
Order placing cost per order : ₹ 50
Cost per kg. of raw materials : ₹ 2
Storage costs : 8% on average inventory

Solution

A = Units consumed during year = 10,000 Kg.
O = Order cost per order = ₹ 50
C = Inventory carrying cost per unit per annum
= ₹ 2 × 8% = ₹ 0.16
EOQ = √ (2AO/C)
= √ (2X10,000X50/0.16)
= 2,500 Kg

No. of orders to be placed in a year = Total consumption of materials per annum / EOQ
= 10,000 Kg / 2500 kg
= 4 orders per year

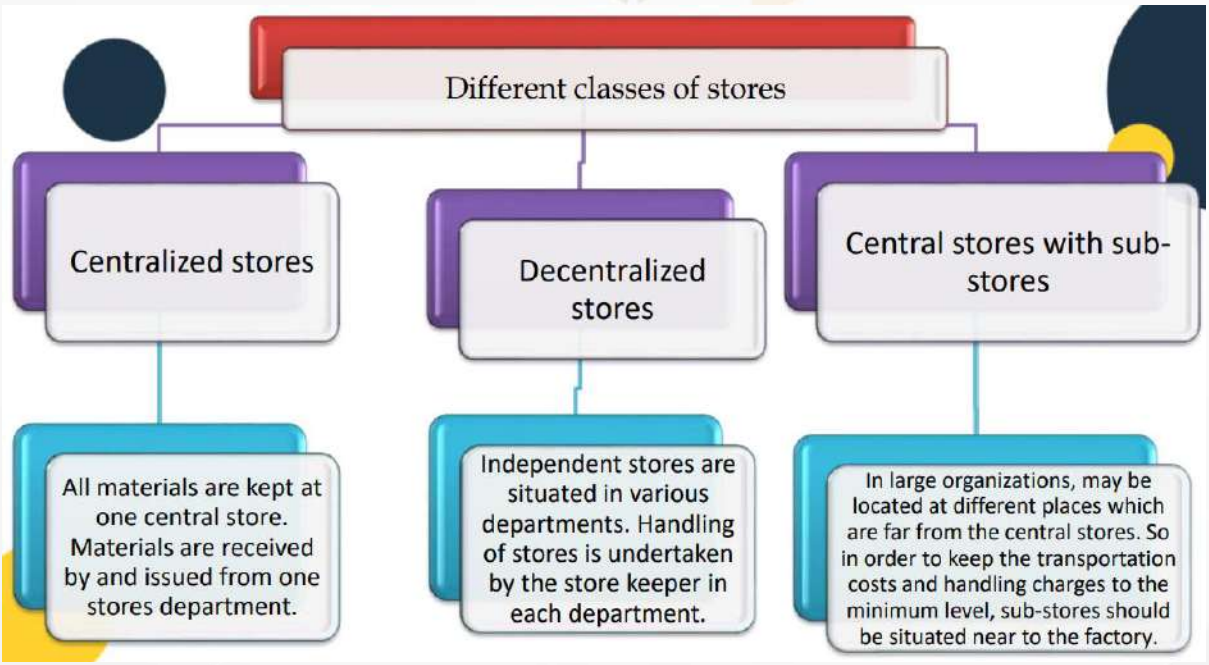
Material Storage Control

Material Storage Control → Once the material is received, it is the responsibility of the stores-in-charge, to ensure that material movements in and out of stores are done only against the authorized

Duties of Store Keeper

- General control over store
- Safe custody of materials
- Maintaining records
- Initiate purchase requisition
- Maintaining adequate level of stock
- Issue of materials
- Stock verification and reconciliation:

Different classes of stores



Store Records

Bin Card	Stores Ledger
It is maintained by the storekeeper in the store.	It is maintained in cost accounting department.
It contains only quantitative details of material received, issued and returned to stores.	It contains information both in quantity and value.
Entries are made when transaction takes place.	It is always posted after the transaction
Each transaction is individually posted	Transactions may be summarized and then posted.
Inter-department transfers do not appear in Bin Card.	Material transfers from one job to another job are recorded for costing purposes.

Maximum Level

- Maximum quantity of an item of material that can be held in stock at any time.
  Maximum Level = Re-Order Level + Re-Order Qty – (Minimum Rate of Consumption × Minimum Reorder Period)

Minimum Level

- Lowest quantitative balance of an item of material which must be maintained at all times
  Minimum Level = Re-Order level – (Normal Rate of Consumption × Normal Re-Order Period)

Re-Order Level

- When the stock in hand reach the ordering or re-ordering level, store keeper has to initiate the action for replenish the material.
  Re-Ordering level = Minimum Level + (Normal Rate of Consumption × Normal Re-order Period) = Maximum Rate of Consumption × Maximum Re-Order period (lead time)

Danger Level

- It is the level at which normal issue of raw materials are stopped and only emergency issues are only made.
  Danger Level = Normal Rate of Consumption × Maximum Reorder Period for emergency purchases

Illustration

Illustration - The components A and B are used as follows:

Normal usage - 300 units per week each — Maximum usage - 450 units per week each

Minimum usage - 150 units per week each — Reorder Quantity – A -2,400 units; B - 3,600 units.

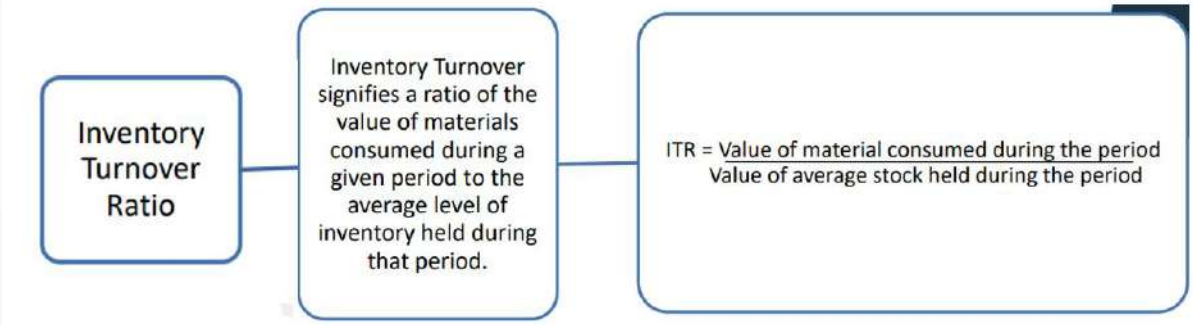
Reorder period - A 4 to 6 weeks, B 2 to 4 weeks.

Calculate for each component: (a) Re-order Level (b) Minimum Level (c) Maximum Level (d) Average Stock Level.

Solution

Particulars	A	B
Re-Ordering level = Max. Rate of Consumption × Max. Re-Order period	2700 Units (450 x 6)	1,800 Units (450 x 4)
Minimum Level = ROL– (Normal Rate of Consumption × Normal Re-Order Period)	1200 units [2700 – (300×5)]	900 units [1800 – (300×3)]
Maximum Level = ROL+ Re-Order Qty – (Min. Rate of Consumption × Min. Reorder Period	4500 units [2700 + 2400 – (150×4)]	5100 units [1800 + 3600 – (150 × 2)]
Average Stock Level = [Min. Level + Max. Level] / 2	2850 units = [4500 + 1200]/2	3000 units = [5100+900]/2

Inventory Turnover Ratio



The purpose of the above ratio is to ascertain the speed of movement of a particular item. A high ratio indicates that the item is moving fast with a minimum investment involved at any point of time. On the other hand a low ratio indicates the slow moving item.

Illustration

Illustration 4 - Compute the Inventory turnover ratio from the following:*

Opening Stock - ₹ 10,000
Closing Stock - ₹ 16,000
Material Consumed - ₹ 78,000

Solution

Solution:

$$\text{Inventory Turnover Ratio} = \frac{\text{Value of material consumed during the period}}{\text{Value of average stock held during the period}}$$

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

$$= \frac{10{,}000 + 16{,}000}{2}$$

$$= 13{,}000$$

$$\text{Inventory Turnover Ratio} = \frac{78{,}000}{13{,}000}$$

$$= 6 \text{ (times)}$$

Perpetual Inventory System

- Perpetual Inventory System may be defined as 'a system of records maintained by the controlling department, which reflects the physical movements of stocks and their current balance'. Thus it is a system of ascertaining balance after every receipt and issue of materials through stock records to facilitate regular checking and to avoid closing down the firm for stock taking.

Periodical Stock Verification

- This system envisages physical stock verification at a fixed date/period during the year. Generally under this system the activity takes place at the end of the accounting period or a date close to such date.

ABC Analysis

- Under this system, the materials stocked may be classified into a number of categories according to their importance.
- The first category - group 'A' items may consist of only a small percentage of total items handled but combined value may be a large portion of the total stock value.
- The second category, - group 'B' items, may be relatively less important.
- In the third category, - group 'C' items - all the remaining items of stock may be included which are quite large in number but their value is not high.

VED Analysis

- VED stands for Vital, Essential and Desirable- analysis is used primarily for control of spare parts.
- The spare parts can be classified in to three categories i.e Vital, Essential and Desirable- keeping in view the criticality to production.

FSN Analysis

- FSN analysis is the process of classifying the materials based on their movement from inventory for a specified period. All the items are classified in to F-Fast moving, S- Slow moving and N-Non-moving Items based on consumption and average stay in the inventory

Just-in-Time

- Just in time (JIT) is a production strategy that strives to improve a business return on investment by reducing in-process inventory and associated carrying costs. Inventory is seen as incurring costs, or waste, instead of adding and storing value, contrary to traditional accounting.
- In short, the Just-in-Time inventory system focuses on "the right material, at the right time, at the right place, and in the exact amount" without the safety net of inventory

Valuation of Material

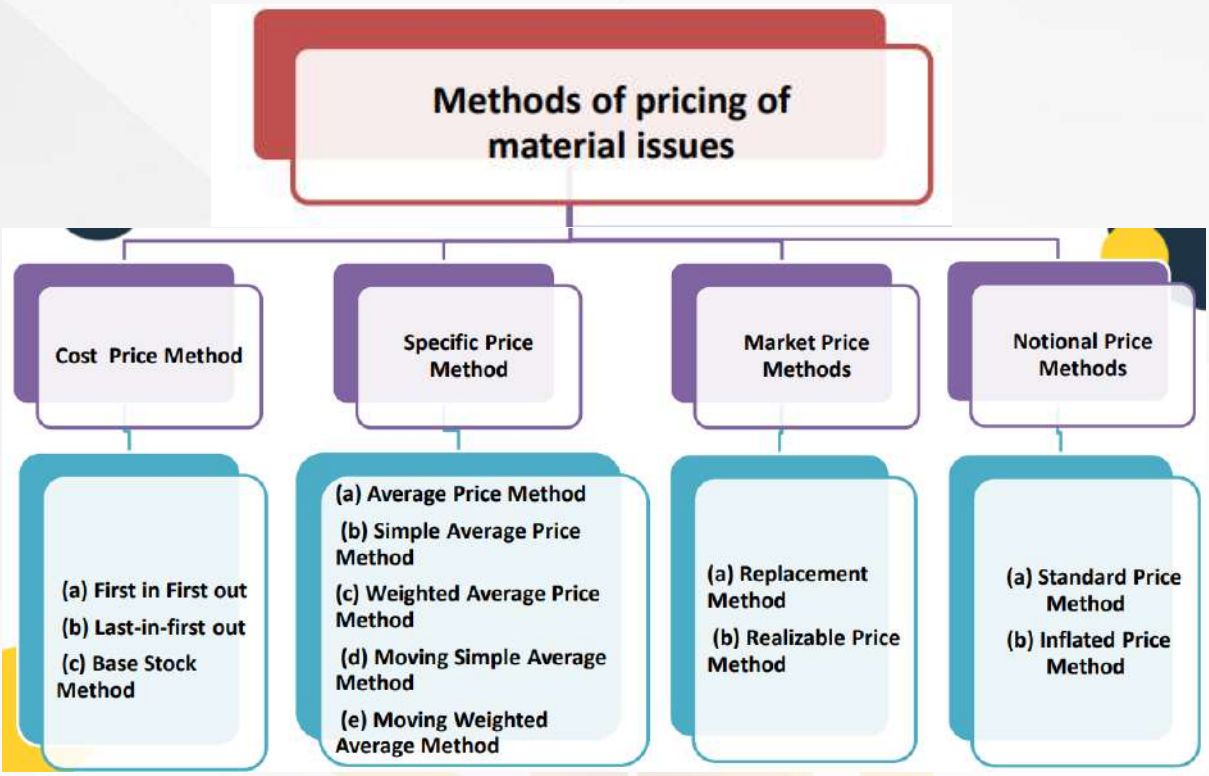
VALUATION OF MATERIAL RECEIPTS

Ascertainment of cost of material purchased is called valuation of materials receipts.
Cost of material includes cost of purchase net of trade discounts, rebates, duty draw-back, input credit availed, etc. and other costs incurred in bringing the inventories to their present location and condition.

Treatment of items associated with purchase of materials

Items	Treatment
Trade Discount	**Deducted** from the purchase price (if it is not shown as deduction in the invoice).
Quantity Discount	**Deducted** from the purchase price (if it is not shown as deduction in the invoice.
Cash Discount	**not deducted** from the purchase price
Subsidy/ Grant	**deducted** from the cost of purchase.
Road Tax/ Toll Tax	If paid by the buyer, **is included** with the cost of purchase.
GST	It **is excluded** from the cost of purchase if credit for the same is available.
Basic Custom Duty	It **is added** with the purchase cost.
Demurrage	abnormal cost and **not included** with cost of purchase
Penalty	**not included** with the cost of purchase
Insurance charges	**added** with the cost of purchase
Commission or brokerage paid	**added** with the cost of purchase.
Freight inwards	**added** with the cost of purchase

Valuation of Material Issues



Cost Price Method

First in – First Out (FIFO) Method

- It is a method of pricing the Issue of materials in the **order in which they are purchased**. This method is considered suitable in times of falling price because the material cost charged to production will be high while the replacement cost of materials will be low.

Last-in-First Out (LIFO) Method

- Under this method the prices of **last received batch (lot) are used for pricing the issues**, until it is exhausted and so on. During the inflationary period or period of rising prices, the use of LIFO would help to ensure the cost of production determined approximately on the above basis is approximately the current one.

Base Stock Method

- A **minimum quantity of stock held at a fixed price as reserve in the stock, to meet a state of emergency**, if arises. This minimum stock is known as **Base Stock and is valued at a price at which the first lot of materials is received** and remains unaffected by subsequent price fluctuations. The **quantity in excess of the base stock may be valued either on the LIFO basis or FIFO basis.**

Specific Price Method

Specific Price Method

- This method is useful, especially when the materials are purchased for a specific job or work order, and as such these **materials are issued subsequently to that specific job or work order at the price at which they were purchased.**

Simple Average Price Method

- Under this method materials issued are **valued at average price**, which is computed by dividing the total of all units rate by the number of units.
- **Material Issue Price = Total of unit prices of each purchase / Total No of Units**

Weighted Average Price Method

- This method uses **total cost of material available for issue divided by the quantity available for issue.**
- Issue Price = Total Cost of Materials in stock / Total Quantity of Materials in stock

Moving Simple Average Price Method

- Under this method the rate for material issue is determined by **dividing the total of the periodic simple average prices of a given number of periods by the number of periods.**

Moving Weighted Average Price Method

- Under this method, the issue, rate is computed **by dividing the total of the periodic weighted average price of a given number of periods by the number of periods.**

Market Price Methods

Replacement Method

- Replacement price is defined as the price at which it is possible to purchase an item, identical to that which is being replaced or revalued. Under this method, **materials issued are valued at replacement cost of the items.**

Realizable Price method

- Realizable price means a **price at which the material to be issued can be sold in the market.** This price may be more or less than the cost price, at which it was originally purchased.

Standard Price Method

- Under this method, materials are priced **at some predetermined rate of standard price irrespective of the actual purchase cost of the materials**. Standard cost is usually fixed after taking into consideration the current price, anticipated market trends

Inflated Price Method

- In case of materials that **suffers loss in weight** due to natural or climatic factors ex: evaporation...etc the **issue price of the materials is inflated to cover up the losses**.

FIFO METHOD

Prepare a Stores Ledger Account from the following information adopting FIFO method of pricing of issues of materials.

2016 March'

1. Open. Bal. 500 tones @ ₹200
3. Issue 250 tones
13. Received 200 tones @ ₹ 190
14. Received 15 tones @ 180
16. Issued 300 tones *

Stores Ledger Account

Date	Receipts			Issue			Balance		
	Q	P	V	Q	P	V	Q	P	V
1/3/16							500	200	1,00,000
3/3/16	--	--	--	250	200	50,000	250	200	50,000
13/3/16	200	190	38,000	--	--	--	250	200	50,000
							200	190	38,000
14/3/16	15	180	3,000	--	--	--	250	200	50,000
							200	190	38,000
							15	180	2,700
16/3/16	--	--	--	250	200	50,000	--	--	--
				50	190	9,500	150	190	28,500
							15	180	2,700

LIFO METHOD

From this information provided as under, you are required to prepare a statement showing how the issues would be priced if LIFO method is followed.

2016 Feb

1. Opening Balance 100 units at ₹10 each.
2.Received 200 units at ₹ 10.50 each
3. Received 300 units at ₹ 10.60 each.
4. Issued 400 units to Job A vide M.R.No.015.7
6. Issued 120 to Job B vide M.R.No.020
7. Received 400 units at ₹ 11 each.
8. Issued 200 units to Job B vide M.R.No.031

Stores Ledger Account

Date	Receipts			Issue			Balance		
	Q	P	V	Q	P	V	Q	P	V
1/2/16	--	--	--	--	--	--	100	10.00	1,000
Feb 2	200	10.50	2,100	--	--	--	100	10.00	1,000
							200	10.50	2,100
Feb 3	300	10.60	3,180	--	--	--	100	10.00	1,000
							200	10.50	2,100
							300	10.60	3,180
Feb 4	--	--	--	300	10.6	3,180	100	10.00	1,000
				100	10.50	1,050	100	10.5	1,050
Feb 6	--	--	--	100	10.50	1050	--	--	--
				20	10.00	200	80	10.00	800
Feb 7	400	11.00	4,400	--	--	--	80	10.00	800
							400	11.00	4,400
Feb 8	--	--	--	200	11.00	2200	80	10.00	800
							200	11.00	2,200

Simple Average Method

Prepare a statement showing the pricing of issues, on the basis of Simple Average Method on 2016 March

1. Purchased 100 units @ ₹10 each
2. Purchased 200 units @ ₹ 10.2 each.
5. Issued 250 units to Job X vide M.R.No.12
7. Purchased 200 units @ ₹ 10.50 each
10. Purchased 300 units @ ₹ 10.80 each
13. Issued 200 units to Job Y vide M.R.No.15
18. Issued 200 units to Job Z vide M.R.No.17
20. Purchased 100 units @ ₹ 11 each
25. Issued 150 units to Job K vide M.R.No.25

Stores Ledger Account

Date	Receipts			Issue			Balance	
	Q	P	V	Q	P	V	Q	P
2016								
March 1	100	10	1000	--	--	--	100	1000
March 2	200	10.2	2040	--	--	--	300	3040
March 5	--	--	--	250	10.10 (1)	2525	50	515
March 7	200	10.5	2100	--	--	--	250	2615
March 10	300	10.8	3240	--	--	--	550	5855
March 13	--	--	--	200	10.50 (2)	2100	350	3755
March 18	--	--	--	200	10.65 (3)	2130	150	1625
March 20	100	11	1100	--	--	--	250	2725
March 25	--	--	--	150	10.90 (4)	1635	100	1090

Working Notes:

- Calculation of Price for Issue on March 5th = (10 + 10.2) / 2 = ₹10.10
- Calculation of Price for Issue on March 13th = (10.2 + 10.5 + 10.8) / 3 = ₹ 10.5
- Calculation of Price for Issue on March 18th = = (10.5 + 10.8) / 2 = ₹ 10.65
- Calculation of Price for Issue on March 25th= (10.8 + 11) / 2 = ₹ 10.90

Weighted Average Method

Prepare a statement showing the pricing of issues, on the basis of Simple Average Method on 2016 March

1. Purchased 100 units @ ₹10 each
2. Purchased 200 units @ ₹ 10.2 each.
5. Issued 250 units to Job X vide M.R.No.12
7. Purchased 200 units @ ₹ 10.50 each
10. Purchased 300 units @ ₹ 10.80 each
13. Issued 200 units to Job Y vide M.R.No.15
18. Issued 200 units to Job Z vide M.R.No.17
20. Purchased 100 units @ ₹ 11 each
25. Issued 150 units to Job K vide M.R.No.25

Stores Ledger Account

Date	Receipts			Issue			Balance	
	Q	P	V	Q	P	V	Q	V
2016								
March 1	100	10	1000	--	--	--	100	1000
March 2	200	10.2	2040	--	--	--	300	3040
March 5	--	--	--	250	10.13 (1)	2533	50	507
March 7	200	10.5	2100	--	--	--	250	2607
March 10	300	10.8	3240	--	--	--	550	5847
March 13	--	--	--	200	10.63 (2)	2126	350	3721
March 18	--	--	--	200	10.63 (3)	2126	150	1595
March 20	100	11	1100	--	--	--	250	2695
March 25	--	--	--	150	10.78 (4)	1617	100	1078

Working Notes:

- Calculation of Price for Issue on March 5th = = 3040/300 = ₹ 10.13
- Calculation of Price for Issue on March 13th = = 5847/550 = ₹ 10.63
- Calculation of Price for Issue on March 18th = = 3721/350 = ₹ 10.63
- Calculation of Price for Issue on March 25th= = 2695/250 = ₹ 10.78