

(D) PRICING OF MATERIAL ISSUES**Need for Pricing**

Ascertainment of accurate cost is one of the main objectives of cost accounting. For a manufacturing company material consumption and material cost are vital aspects. Ascertainment of accurate cost depends on correct valuation of material used in the product. The material cost consists of invoice price plus freight, carriage, cartage, insurance, taxes, stores costs, etc.

Materials are issued to different departments, different orders and jobs from stores. The jobs are to be correctly charged with material consumed. But the material in stores will be of different lots received at different prices on different occasions. This makes it necessary to decide about the price to be charged to jobs which are issued with materials from different lots.

The following are essential for ascertainment of accurate material cost:

- (I) Computation of total cost of material purchased.
- (II) Systematised material issue procedure.
- (III) Appropriate methods of pricing material issues.

(I) Computation of Total Cost of Material Purchased

Most of the details needed to ascertain the total cost of material purchased can be obtained from the invoice sent by the supplier.

The basic purchase price has to be adjusted in the light of delivery and forwarding charges, sales tax, excise duty, etc. Similarly, transport charges and cost of containers have to be included. Any discounts receivable have to be appropriately subtracted.

(a) Discounts : There are three types of discounts to be considered:

- (i) **Trade Discount :** This is a discount allowed by the supplier to compensate the buyer for the costs of 'breaking bulk', selling in small lots to customers, repacking, etc. The supplier is relieved from all these costs by the buyer by purchasing a large quantity. This discount is usually given by the wholesalers.
- (ii) **Quantity Discount or Bulk Discount :** This discount is allowed by the supplier as a measure of savings in cost which arise from the production of longer runs and the distribution of larger quantities. Part of the savings accruing to the supplier out of a large order is passed on to the buyer by means of quantity discount.
- (iii) **Cash Discount :** This discount is offered by the supplier to the buyer as an option. The discount is linked to payment of the invoice amount before a specified due date or within a specified number of days. The purchaser

may make use of the option and obtain the discount if his cash position permits it. Generally, this discount is considered as a matter of 'financial policy' and not taken into account for computation of material cost.

(b) Transport and Storage Costs : If transport cost and cost of storage in transit are not included in the invoiced price of the supplier, they may be added as the direct costs of purchase to the cost of material. If it is not possible to identify such costs with specific materials because of paying a combined amount for several materials, they may be treated as indirect expenditure and included in the overhead.

(c) Cost of Containers : The supplier may or may not charge separately for containers. If no charges are made, no accounting treatment is required. If container charges are made, the treatment may depend upon the following circumstances:

- (a) **Non returnable containers :** The container costs are added to the purchase price.
- (b) **Returnable containers credited at reduced value on return :** The difference between the cost of containers and the amount credited by the supplier on return is added to the purchase price.
- (c) **Returnable containers credited at full value on return :** The cost of containers is not added to the price since no cost is incurred by the buyer.
- (d) **Sales tax, excise duty, insurance, etc. :** These items are added to the purchase price to ascertain the total cost of material purchased.

(II) Material Issue Procedure

Materials kept in the stores are to be issued to production departments whenever the departments require them. The store keeper is to issue materials only when a material requisition is presented to him.

Material Requisition: It is a properly authorised document initiated by the production departments to draw the required material from stores. It has to be initiated by properly authorised person to avoid misappropriation of material. The ruling of material requisition is given earlier.

The requisition serves as authority to the store keeper to issue materials. The store keeper puts serial number on the requisition and makes entries in the issue column of the bin card. After this the requisitions are sent to the cost office where the value of material issued is also filled up and credit is given to the material issued in the stores ledger and the job receiving the material in the job ledger is debited.

Bill of Materials

It is a document listing all the materials required with quantities required for a particular job, order or process. The bill of material serves the purpose of material requisition. The bill of material is prepared for a job of non standardised type so that estimate of all materials required for the job is made by the production department before the job is started. This is helpful to estimate material cost of the job for submitting tenders or quotations. A specimen form of a bill of materials is given below :

ABC Company Bill of Materials					
Job No. _____		No. _____		Date _____	
Serial No.	Description	Material Code No.	Quantity	For Cost office use	Remarks
				Rate	Amount
Authorised by _____		Priced by _____			
Issued by _____		Stores Ledger Folio _____			

Treatment of Surplus Materials**(a) Return of Surplus Material**

Sometimes, excess materials may be issued to production departments. When these materials are returned to stores a Material Return Note is to be prepared by the department which has the excess materials. Generally, three copies are prepared. One copy is retained by the department which is returning the material. Two copies are sent to the store keeper. The store keeper keeps one copy for making entries in the Bin card and the second copy is sent to the cost office for making entries in the stores ledger and for giving credit to the job where the material is in excess.

(b) Transfer of Surplus Materials

Transfer of excess materials from one job to another job is to be avoided as far as possible. This is because record for transfer may not be made and actual material cost of jobs may be inaccurate. However, sometimes the material may be

allowed to be transferred to avoid delays and handling charges. The transfer is to be allowed only with preparation of material transfer note so that the cost of material transferred is debited to the job receiving the material and credited to the job transferring the material.

(III) Methods of Pricing Material Issues

The purchase prices of materials fluctuate on account of changes in the product prices, buying from different suppliers and on account of quantity discounts. Because of price fluctuations, the stock may include several lots of the same material purchased at different prices. When these materials are issued to production, it is important to consider the correct price at which these materials are charged to production.

There are various methods in use. They are broadly classified under the following categories :

1. Cost Price Methods

- a) First in First out (FIFO)
- b) Last in First out (LIFO)
- c) Specific price
- d) Base stock
- e) Highest in first out (HIFO)

2. Derived from Cost Prices or Average Price methods

- f) Simple Average
- g) Weighted Average
- h) Periodic Simple Average
- i) Periodic Weighted Average
- j) Moving Simple Average
- k) Moving Weighted Average

3. Notional Price Methods

- l) Standard Price
- m) Inflated Price
- n) Re-use Price
- o) Replacement Price

All the above methods are explained below in detail.

1. Cost Price Methods

This group of methods consists of all those methods wherein each lot of material purchased is charged to various departments at the actual cost of purchase. When one lot at a particular price is exhausted, the next lot is issued at the purchase price of that lot and so on, as per the particular method used. Thus, the prices charged are always the actual purchase prices and not average or notional prices.

(a) First in First out method (FIFO)

Different lots of the same material received are noted in the order in which they have entered into the stock. When an issue is made, the price of the earliest lot in the stock is charged to the receiving department. When that lot is exhausted, the next lot is issued at the respective price of that lot. This method resembles the 'queue' system because the material which entered the store first goes out first.

Advantages of FIFO Method

1. Prices are based on actual costs. No profit or loss on stocks results from using this method.
2. Stock balances are of fair commercial value representing the latest market prices.
3. This method is suitable in case of slow moving materials.
4. It is appropriate in situations of falling prices to charge the jobs with higher prices purchased earlier.

Disadvantages of FIFO Method

1. Possibility of more clerical errors due to more number of calculations.
2. The cost of similar jobs differ if the prices fluctuate.
3. In times of rising prices, the cost of jobs does not reflect current market prices. This inflates the profits unnecessarily, resulting in higher taxes.

(b) Last-in-First out method (LIFO)

Under this method, the price of material last purchased and kept in stores is charged for the issues first and then the preceding lots purchased are issued. This method is used to take advantage of rising prices.

Advantages of LIFO Method

1. This method is simple to operate when issues are not too many.
2. Prices are based on actual cost. Therefore there is no possibility of profit or loss in stocks.
3. Production cost reflects latest market prices.
4. This method is suitable in case of rising prices because materials are issued at current market prices. The jobs and production are charged at the latest prices. Thus, profit on the jobs is not unnecessarily inflated.

Disadvantages of LIFO Method

1. This method also involves tedious clerical work which may lead to clerical errors.
2. Comparison of jobs becomes difficult as they use same raw material but are charged with different prices.
3. During the period of falling prices the stocks are at high prices, which may necessitate writing off stock values to show the stocks at their market values.

(c) Specific Price Method

This method is followed in concerns which use job order costing. In order to show the correct material cost of a job, materials are purchased for the job and the purchase price is charged to that job. This is done when non standard materials are to be purchased for a particular job specifications. A firm may use a standard method for pricing and when the material specifically purchased are issued for a specific job, the specific purchase price is charged to that job.

(d) Base Stock Method

This method involves usage of any method of pricing of issues, keeping a 'minimum stock' of material at all times at a fixed price irrespective of the price fluctuations. Such minimum stock is not used unless an emergency arises. The method is based on the logic that stock never reaches 'Zero' level and an absolute minimum balance of stock is called the *Base Stock* and it is shown at a fixed price.

(e) Highest in first out method

Under this method, the highest priced materials in stock are issued first. This method is based on the principle of consumption at the highest cost and inventory value of material at the lowest possible price.

2. Derived from Cost Price Methods (or) Average Price Methods

When materials are purchased frequently and issues to jobs or production are also made very often, cost price methods can distort the cost structure of different jobs or output. The same material is charged at different prices, sometimes even on the same day. Costing data may not be useful for comparison purpose. To avoid such grave danger, average price methods are followed by many organisations. The following are the different average price methods prevailing in practice.

(f) Simple Average Price Method

When the variance between purchase prices is very little, this method is the most suitable one. Here the total of the prices of materials in the stock (from which the material to be priced could have been drawn) is divided by the number of prices used to ascertain the 'simple average price'. Irrespective of the quantities, the average of the prices is found. One lot may be 5 Kgs and another lot may 5,000 Kgs. But the prices per Kg of both lots are taken for average purpose.

It should be noted that for the purpose of physical movement of materials, FIFO (First in First Out) method is assumed which forms the basis of simple average method. Thus, the prices of earlier lots are left out of simple average calculation, as and when materials are issued and older lots are exhausted.

Advantages

1. It is simple and easy to calculate the issue price.
2. This method reduces the effect of fluctuation of prices by averaging the price.

Disadvantages

1. This method does not take into account the quantity purchased at each price. This may lead to absurd results.
2. As the actual price is not used, Profit or Loss on material will usually arise.
3. The value of closing stocks under this method is absurd. When price fluctuates sharply, the closing stock shows credit balance, that is negative figure!

(g) Weighted Average Price Method

The weighted average price is calculated by dividing the value of stock in the stores by the quantity in the stock from which materials are to be issued. As this method takes into account the relative weights, it reduces the effect of fluctuations in prices.

The method is different from all other methods because in this method prices are calculated on receipt of material and not at the time of issue of materials.

Advantages

1. This method is suitable where the prices vary very much from one purchase to another. As it uses quantities for calculation of average prices, the fluctuations are evened out.
2. The basis of calculation in the method is simple as the price is calculated by dividing the value of materials by their quantity.
3. A new price is calculated when new materials are purchased. All the subsequent issues are made at the price calculated until next lot is received. Thus, the clerical work is simplified and reduced.
4. The stock balance reflects fair prices which may be taken for financial statements.

Disadvantages

1. This method is more complicated than simple average price as it takes into account the total quantity and value.
2. Since actual price is not used, Profit or Loss may arise in material cost by using this method.
3. Where receipts are numerous, calculations will be many and may result in errors.
4. The price may have to be taken upto three or four decimal places to calculate the correct value of large quantities. Otherwise, approximation may lead to difference in accounts.

(h) Periodic Simple Average Method

Under this method the total value of the purchases is divided by the total number of prices during the accounting period to find average price. This method is similar to that of simple average price with the exception that only one price is

Materials

to be calculated periodically. This method is adopted in costing continuous processes where each individual order is absorbed into the general cost of production.

(i) Periodic Weighted Average Method

This price is calculated by dividing the total value of material by the total quantity of material purchased and received during the accounting period. This method takes into account the quantities as well and therefore it is used when prices fluctuate substantially. This method is used in process industries.

(j) Moving Simple Average Method

This is a price which is calculated by dividing the total of periodic simple average prices of a given number of periods by the number of periods. This method is used when there are high fluctuations in material prices.

(k) Moving Weighted Average Method

This price is calculated by dividing the total of periodic weighted average prices of a given number of periods by the number of periods.

The effect of Price fluctuations is damped by using this method as in the case of moving simple average price method.

3) Notional Price Methods

This group of methods are either predetermined prices or some other prices other than the original purchase prices, not even the average of the purchase price. Thus, the prices charged under these methods are completely different from the actual purchase prices.

(l) Standard Price Method

This price is predetermined price fixed on the basis of all factors affecting the price. A standard price is fixed and the actual price is compared with the standard price. If actual price is more than the standard price, loss occurs and if actual price is less than the standard price, a profit will be obtained. While operating the pricing method the issue price is uniform for all quantities issued. The loss or profit on material is termed as 'Material price variance'.

Advantages

1. This method is relatively simple to operate as a single issue price is used during the accounting period.
2. Comparison of jobs becomes easier as the issue price is same.
3. It eliminates clerical errors as issue price is fixed.
4. This method facilitates ascertaining efficiency or otherwise of material purchases.

Disadvantages

1. This method may show profit or loss on issue and closing stock may show absurd figures.

(m) Inflated Price Method

This method aims at covering the costs of contingencies in addition to the purchase price. The issue price includes purchase price plus losses due to evaporation, wastage in handling and storage, carrying costs, etc. This method aims at recovering the full material cost.

(n) Re-use Price Method

This method is followed in pricing of materials issued for 're-use'. Materials originally purchased for a particular purpose but returned to the stores from the concerned department may be reissued to another department for a different purpose. The price charged is the normal price of material used for such works and not the original purchase price. Usually, material loss is incurred when re-use price method is employed.

(o) Replacement Price Method

The current market price of materials is charged on the issues. The method is used to reflect the production cost at current market prices. This method shows profit during rising prices and losses during falling prices on the material issues. Stocks also do not represent correct values.

(E) MATERIAL LOSSES

The material requirements of production are issued on the basis of material requisitions. The output is obtained along with wastage, scrap, spoilages and defectives. The accurate cost of output can be computed after taking the losses into account.

Losses in the form of waste, scraps, spoilage and defectives are inherent and inevitable with any manufacturing activity. These losses can be controlled through adequate reporting and responsibility accounting. Standard for each type of loss is fixed. Actuals are compared and action is to be taken by the management to control the abnormal losses, based on the variances.

Different types of Material Losses**(1) Waste**

Waste is inherent in any manufacturing activity. Waste is a part of raw material lost in the process of production having no recoverable value. Waste occurs invisibly in the form of evaporation or shrinkage. It can be visible and solid also. Examples of visible wastes are gases, dust, valueless residue, etc. Sometimes disposal of waste entails additional expenditure. Example: atomic waste. Loss in the form of waste increases the cost of production.

Control of Waste: A waste report is prepared periodically. The actual waste is compared with standard waste and remedial action is taken to control abnormal waste.

Accounting Treatment

Waste has no value. The accounting treatment differs according to waste being normal or abnormal.

1. Normal waste : This is the inherent waste while manufacturing. It is in the form of evaporation, deterioration etc. The total cost of normal waste is distributed among the good units of output.

2. Abnormal waste : The abnormal waste is transferred to costing profit and loss A/c to avoid fluctuation in production cost.

ABC Company Ltd. Waste Report				
Department _____	Cost Centre _____			
Process or Job No. .	Weight of Waste	Percentage of Waste to production %	Normal Percentage of Waste %	Remarks
Action taken by _____				
Entered by _____				Signature of Inspector

2) Scrap

Scrap is the residue from certain manufacturing activities usually having disposable value. It can also be the discarded materials which can fetch some income. Examples of scrap are outlined material from stamping operations, filings, Saw dust, short lengths from wood working operations, sprues and 'flash' from foundry and moulding processes. Scrap may be sold or reused.

Control of Scrap

Scrap is controlled by fixation of standards for scrap, fixation of department wise responsibilities for scrap, etc. Keeping up proper records of scrap and periodical reporting helps in control of scrap. Actual scrap is compared with standard scrap. Suitable action is taken for excessive actual scrap over standard scrap.

ABC Company Ltd. Scrap Report					
Department _____	Cost Centre _____	No. _____	Date _____		
Process or Job No.	Actual Scrap Kg/Pcs.	Actual % of Scrap	Normal Scrap %	Abnormal Scrap Quantity	Remarks
Action taken by _____					
Entered by _____					

Accounting Treatment

- Sale value of scrap credited to profit and loss A/c :* The sale value is credited to profit and loss account as other income. The cost of output is inclusive of scrap cost. This method of accounting treatment is adopted when the value is negligible.
- The Sale value credited to overhead or material cost :* The sale value is reduced with selling cost of scrap and the net sale value is deducted from factory overhead or from material cost. This method is adopted when several jobs are done simultaneously and it is not possible to segregate the scraps jobwise.
- Crediting the sale value to the Job or process in which Scrap arises :* The sale value of scrap is credited to the job or process concerned from which the scrap has arisen. This method is followed when identification of scrap with specific jobs or processes is easy.

Materials**3. Spoilage**

Spoilage occurs when goods are damaged beyond rectification. Spoilage is disposed off without further processing. Spoilage cost is the cost upto the point of rejection less sale value.

The method of sale of spoilage depends on the extent of spoilage. Some of the spoilage is sold as seconds if the extent of damage is less; rest may be sold as scrap or treated as waste.

Control of Spoilage : Spoilage is controlled through proper reporting about the extent of spoilage. Standards are fixed as a percentage on production. Actual spoilage is compared with standard and variance is recorded. If the actual spoilage is more than the standard, suitable action is suggested to control it.

Accounting Treatment of Spoilage

Accounting treatment depends on whether the spoilage is normal or abnormal. Normal spoilage is borne by good units of output since it is inherent with production and it happens even under efficient conditions. Abnormal spoilage is avoidable under efficient conditions. The cost of abnormal spoilage is charged to profit and loss account.

ABC Company Ltd. Spoilage Report						
Department _____	Cost Centre _____	No. _____	Date _____			
Process or Job No.	Spoiled Units	Actual Spoilage %	Standard Spoilage %	Cost of Spoilage	Cost of Abnormal Spoilage	Remarks for Abnormal Spoilage
Action taken by _____						
Entered by _____						

4. Defectives

It is a part of production which can be rectified and made into good units with additional cost. The defective work occurs due to raw materials of inferior quality, bad planning and poor workmanship. Defective units are rectified with additional cost of material, labour and overheads and sold as 'first quality' or 'seconds'.

(a) Control of Defectives: As in the case of other losses, defectives are controlled by accurate and periodical reports. Standards are fixed for defectives. Actual defective work is compared with standards. If actuals are more than the standards remedial action is taken to control it.

(b) Accounting Treatment of Defectives : The accounting treatment depends on the extent of defectives production. If it is normal being inherent with production, it is identified with specific jobs. The cost of rectification is charged to specific jobs. If the cost is not traced with a job, the cost of rectification is treated as factory overhead.

If the defective work is out of abnormal circumstances the cost of rectification is transferred to profit and loss account.

ABC Company Ltd. Defective Work Report						
Department _____	Cost Centre _____	No. _____	Date _____			
Process or Job No.	Defective Units	Normal Defective Units	Abnormal Defective Units	Cost of Rectification	Disposal Value	Remarks
Action taken by _____				Signature of Inspector		
Entered by _____						

5. Obsolete, Slow moving and Dormant Stocks

These items are part of inventory. They need suitable and timely action on the part of the management to avoid occurrence of loss in due course and to prevent locking up of working capital.

(a) Obsolete Stocks : They are those stocks in the inventory which have been lying unused due to change in product process and design or method of manufacturing. They are generally out of date.

(b) Slow moving Materials : They are items in stock used at long intervals and thus lying idle for long periods.

(c) Dormant Stocks : They are items in stock not at all in use for a significant period of time.

The store keeper should highlight such items in his periodical reports so that the management may try (a) to dispose them off at any price or (b) clear them out to save space in the stores (c) exercise caution in future purchase of such items of materials.

ILLUSTRATIONS

I. PURCHASE PRICE COMPUTATION

(A) Selection of Supplier

Illustration 1

After inviting tenders, two quotations are received as follows:

Supplier A : Rs. 2.20 per unit

Supplier B : Rs. 2.10 per unit plus Rs. 2,000 fixed charges irrespective of units ordered. (1) Calculate the order quantity for which the purchase price per unit will be the same. (2) The purchase officer wants to place an order for 15,000 units. Which supplier should be selected?

[Madras, B.C.S. (ICE) Oct. 2003;
Kerala, B.Com., Oct. 1990]

Solution :

Based on the quotations of suppliers, it is obvious that :

Quotation of supplier 'A' is Re. 0.10 more per unit without any fixed cost.

Quotation of supplier 'B' is Re. 0.10 less per unit with fixed cost of Rs. 2,000.

- (1) The order quantity for which

$$\text{the purchase price per unit will be the same} = \frac{\text{Amount of Fixed cost}}{\text{Difference in purchase price per unit}}$$

$$= \frac{2,000}{0.10} = 20,000 \text{ units.}$$

At an order quantity of 20,000 units, both suppliers' quotations are equal

$$A - 20,000 \times 2.20 = \text{Rs. } 44,000$$

$$B - 20,000 \times 2.10 + 2,000 = 42,000 + 2,000 = 44,000$$

Purchase price per unit in both cases is Rs. 2.20

- (2) For orders above 20,000 units, quotation of supplier 'B' is cheaper by Re. 0.10 per unit.

For orders below 20,000 units, quotation of supplier 'A' is cheaper, in total.

$$\text{Total cost of order, if it is placed with supplier 'A'} = 15,000 \times 2.20 = \text{Rs. } 33,000$$

If the same order is placed with supplier 'B' :

$$\text{Total cost of order} = \text{Rs. } 2,000 + (15,000 \times 2.10) = 2,000 + 31,500 = \text{Rs. } 33,500$$

Purchase officer should place the order of 15,000 units with supplier 'A' because it is cheaper by Rs. 500 ($33,500 - 33,000$).

(B) Computation of Purchase Price

Illustration 2

A supplier quotes for material 'M' as follows :

Lot price 200 Kg @ Rs. 5 per Kg.

500 Kg @ Rs. 3.5 per Kg.

800 Kg @ Rs. 2.5 per Kg.

He allows a trade discount of 25% and a cash discount of 3% if payment is made within 15 days. One container is required for every 100 Kgs. of the materials and the containers are charged at Rs. 15 each but credited at Rs. 10 on return. The buyer decides to buy 800 Kgs. Transport charges amounting to Rs. 200 are charged by the supplier. Calculate the purchase price of 800 Kgs.

Solution :

Statement of Cost of Quotation for Materials

Ordering quantity 800 Kg. Particulars	Amount Rs.	Amount Rs.
800 Kgs at Rs. 2.5 per Kg.		2,000
Less : Trade Discount at 25%	$2,000 \times \frac{25}{100}$	500
Add : Cost of Containers : $\frac{800}{100} \times 15$	120	
Less : Credit on return 8×10	80	40
Add : Transport Charges		40
Total cost of Material		200
Note : Cash discount is a matter of financial policy and depends on liquidity position of the purchasing firm. So, it should be ignored unless specific data is given about opting for such discount.		1,740

(C) Purchase Price Computation with Material Losses

Illustration 3

In a truck load, the following materials were received:

Code No.	Material	Quantity	Rate Rs.
M2010	Carbon Black	3,050 Kgs.	4.00 Per Kg.
P5025	S.H. Phosphate	2,060 Kgs.	3.00 Per Kg.

Sales Tax was charged at 5%

Railway Freight Rs. 1,050

Transport Charges Rs. 100

Loading & unloading Rs. 50

The Goods Received Note received from the store keeper showed the following quantity.

M2010 - 3,000 Kgs.

P5025 - 2,000 Kgs.

From the above figures you are required to calculate the purchase rate per Kg. of Carbon Black and S.H. Phosphate.

[Madras, M.Com. Nov. 1984]

Solution :

Statement of Cost of Materials

Particulars	Carbon Black M2010 Rs.	S.H. Phosphate P5025 Rs.
Invoice Value	12,200	6,180
Sales Tax at 5%	610	309
Railway Freight (Ratio: Weight) 3050 : 2060	627	423
Transport Charges (Ratio-Weight) 3050 : 2060	60	40
Loading & unloading (Ratio-Weight) 3050 : 2060	30	20
I Total cost of material	13,527	6,972
II Actual Quantity received	3,000 Kgs.	2,000 Kgs.
III Cost per Kg. I/II	4.509 or 4.51	3.486 or 3.49

Note : Difference between quantity ordered and received is treated as normal shortages due to handling.

Illustration 4

The following is the data relating to materials received from a supplier as per the invoice.

	Rs.
Material X – 10,000 Kgs. at Rs. 5 per Kg.	50,000
Material Y – 5,000 Kgs. at Rs. 8 per Kg.	40,000
Freight	9,000
Excise duty (at 4%)	3,600
	1,02,600

Shortage due to breakage, considered as normal – Material X 50 Kgs. Material Y 40 Kgs.

Ascertain the effective cost of the materials per Kg. if provision has to be made for a further wastage due to handling in stores of 50 Kgs and 60 Kgs. respectively for material X and Y.

Solution :

Statement showing Cost of Materials

Particulars	Material X Rs.	Material Y Rs.
Purchase value (as given)	50,000	40,000
Add : Freight (in the ratio of weight 2 : 1)	6,000	3,000
Add : Excise duty (at 4%)	2,000	1,600
Total Cost (A)	58,000	44,600
	Kgs.	Kgs.
Less : Shortage due to breakage	10,000	5,000
	50	40
Less : Wastage due to Handling	9,950	4,960
Net Weight (B)	50	60
	9,900	4,900
Effective cost of material per Kg. A B	$\frac{58,000}{9,900} = 5.86$	$\frac{44,600}{4,900} = 9.10$

D) Purchase cost of Materials in Mixed lots**Illustration 5**

A truck load of materials of different grades was purchased for Rs. 2,25,000. Materials are sorted into the following grades whose market price is shown against each of them.

	Units	Selling price per unit
Grade I	25,000	6.00
Grade II	15,000	5.00
Grade III	10,000	2.50

Find out the purchase rate per unit of each grade of the material assuming that all the grades yield same rate of profit.

Solution :

Since the three grades of material yield same rate of profit, the purchase price of each grade must be in direct proportion to selling price of the respective grades of materials.

	Rs.
Grade I – 25,000 units @ Rs. 6	1,50,000
Grade II – 15,000 units @ Rs. 5	75,000
Grade III – 10,000 units @ Rs. 2.5	25,000
	—————
Total selling price of all materials	2,50,000

The cost of material (Rs. 2,25,000) is to be divided in proportion of 1,50,000 : 75,000 : 25,000 i.e., 6 : 3 : 1.

$$\text{Cost of purchase of grade I} = 2,25,000 \times \frac{6}{10} = \text{Rs. } 1,35,000$$

$$\text{Cost per unit} = \frac{1,35,000}{25,000} = \text{Rs. } 5.4 \text{ per unit}$$

$$\text{Cost of purchase of grade II} = 2,25,000 \times \frac{3}{10} = \text{Rs. } 67,500$$

$$\text{Cost per unit} = \frac{67,500}{15,000} = \text{Rs. } 4.5 \text{ per unit}$$

$$\text{Cost of purchase of grade III} = 2,25,000 \times \frac{1}{10} = \text{Rs. } 22,500$$

$$\text{Cost per unit} = \frac{22,500}{10,000} = \text{Rs. } 2.25 \text{ per unit}$$

(e) Inventory Turnover Ratio

Illustration 6

The following information is relating to a material for the year ended 2010. The value of material is Re. 1 per Kg.

Opening Stock	800 Kg.
Purchases	12,000 Kg.
Closing Stock	400 Kg.

Calculate the material turnover ratio and express in number of days the average inventory held.

Solution :

Inventory turnover ratio or Material Turnover Ratio

$$= \frac{\text{Cost of Material Consumed}}{\text{Average value of Material in stock}}$$

$$\begin{aligned} \text{Cost of Material Consumed} &= \text{Opening Stock of Material} + \text{Purchase of Material} - \\ &\quad \text{Closing stock of Material} \\ &= 800 + 12,000 - 400 \\ &= \text{Rs. } 12,400 \end{aligned}$$

Average value of Material

$$\begin{aligned} &= \frac{\text{Opening Stock of Material} + \text{Closing Stock of Material}}{2} \\ &= \frac{800 + 400}{2} = \text{Rs. } 600 \end{aligned}$$

Material or Inventory turnover ratio

$$= \frac{12,400}{600} = 20.67 \text{ times}$$

$$\begin{aligned} \text{Inventory or Material Turnover in Days} &= \frac{\text{Days during the period}}{\text{Material or Inventory turnover ratio}} \\ &= \frac{365 \text{ days}}{20.67} = 17.65 \text{ days (or) 18 days.} \end{aligned}$$

Illustration 7

From the following data for the year ended 31st December, 2006, calculate the inventory turnover ratio of the two items and put forward your comments on them.

	Material A Rs.	Material B Rs.
Opening Stock as on 1-1-2006	10,000	9,000
Purchases during the year	52,000	27,000
Closing stock, as on 31-12-2006	6,000	11,000

[I.C.W.A., Inter, Dec. 1987]

[Madras, BCS(NYE) April 2007]

Solution :

$$\text{Inventory Turnover ratio} = \frac{\text{Cost of Material Consumed}}{\text{Average Inventory}}$$

For Material A

$$\begin{aligned} \text{Cost of Material Consumed} &= \text{Opening Stock of Material} + \text{Purchase of Material} \\ &\quad - \text{Closing stock of Material} \\ &= 10,000 + 52,000 - 6,000 \\ &= \text{Rs. } 56,000 \end{aligned}$$

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

$$\text{Average Inventory} = \frac{10,000 + 6,000}{2} = \text{Rs. } 8,000$$

$$\text{Inventory Turnover ratio} = \frac{56,000}{8,000} = 7 \text{ times}$$

For Material B

$$\begin{aligned} \text{Cost of Material Consumed} &= 9,000 + 27,000 - 11,000 \\ &= \text{Rs. } 25,000 \end{aligned}$$

$$\begin{aligned} \text{Average Inventory} &= \frac{\text{Opening Stock} + \text{Closing Stock}}{2} \\ &= \frac{9,000 + 11,000}{2} = 10,000 \end{aligned}$$

$$\text{Inventory turnover ratio} = \frac{25,000}{10,000} = 2.5 \text{ times.}$$

Comment :

The inventory turnover ratio of Material A is higher than that of B. Therefore, Material A is fast moving compared to Material B.

II. EOQ - ECONOMIC ORDERING QUANTITY

(A) Simple Problems

Illustration 8

Find out the economic order quantity (EOQ) from the following particulars:

Annual usage : 6,000 units

Cost of Material per unit : Rs. 20

Cost of placing and Receiving one order : Rs. 60. Annual carrying cost of one unit : 10% of Inventory value.

[*Periyar BBA, Nov. 2004; Madurai, B.B.A., Nov. 1991*]

[*Madras, B.Com(gen & AF) April 2010; April 2009;*

B.Com(PZSA) Ap 2007; B.C.S. Oct. 2001 (10 times);

B.C.A., B.Sc., Oct. 2001; B.C.A./B.Sc., (ICE) Oct. 2001]

Solution :

$$\text{EOQ} = \sqrt{\frac{2AB}{CS}}$$

where :

A = Annual Usage

B = Buying cost per order

C = Cost per unit

S = Storage and carrying cost % P.A.

$$\text{EOQ} = \sqrt{\frac{2 \times 6,000 \times 60}{20 \times \frac{10}{100}}}$$

= 600 Units

(B) EOQ-with ordering schedule

Illustration 9

Find out the economic order quantity and the number of orders per year from the following information:

Monthly consumption 3,000 units

Cost per unit Rs. 54

Ordering cost Rs. 150 per order

Inventory carrying cost 20% of the average inventory.

[I.C.W.A. adapted]

Solution :

[Bharathiar, B.Com(E.Commerce) Nov. 2007]

Annual consumption = $3,000 \times 12 = 36,000$ units

$$\text{EOQ} = \sqrt{\frac{2AB}{CS}}$$

where :

A = Annual usage of Material

B = Buying cost per order

C = Cost per unit

S = Storage and carrying cost % P.A.

$$\text{EOQ} = \sqrt{\frac{2 \times 36,000 \times 150}{54 \times \frac{20}{100}}} = \sqrt{10,00,000}$$

= 1,000 units.

$$\text{Number of orders per year} = \frac{36,000}{1,000} = 36$$

$$\text{Frequency of orders} = \frac{\text{Days or Months in the year}}{\text{No.of orders per annum}}$$

$$= \frac{365}{36} = 10 \text{ days or } \frac{12}{36} = \frac{1}{3} \text{ Month}$$

An order is to be placed once in 10 days or $\frac{1}{3}$ of a month for 1000 units each time

(C) EOQ - When Material usage is given in Rupees

Illustration 10

You are required to compute the economic ordering quantity and the frequency of the orders in terms of days, from the data given below:

Consumption of Material per annum Rs. 8,000

Ordering Costs per order Rs. 25

Storage and carrying cost per annum 10% of inventory value.

Solution :

$$\text{EOQ} = \sqrt{\frac{2AB}{S}}$$

where

EOQ = Economic ordering quantity in rupees.

A = Annual consumption of material in rupees.

B = Buying cost per order.
S = Storage and carrying cost %

$$\text{EOQ} = \sqrt{\frac{2 \times 8,000 \times 25}{10}} = \sqrt{\frac{2 \times 8,000 \times 25 \times 100}{100}} = \sqrt{40,00,000} = \text{Rs. } 2,000$$

$$\text{Frequency of orders in terms of days} = \frac{\text{Days in the year}}{\text{No. of orders per Annum}}$$

$$\text{No. of orders per Annum} = \frac{\text{Annual Consumption}}{\text{EOQ}}$$

$$= \frac{8,000}{2,000} = 4$$

$$\text{Frequency of orders} = \frac{365}{4} = 91.25 \text{ (or) 91 days}$$

Note : Since Annual consumption is given in Rupees instead of units, the formula for EOQ is slightly changed.

(D) EOQ – When details of costs are given

Illustration 11

A factory consumes 60 units of material per day which is supplied by a vendor in lots of 240 units each at Rs. 2,400 per lot. The factory works for 300 days per annum.

Each order involves handling charges of Rs. 120 and Freight charges of Rs. 380. The storage cost is Re. 0.50 per unit per annum. The interest cost to carry inventory works out at 1.25% per month.

You are required to ascertain (1) No. of units to be ordered each time to minimise the overall inventory cost. (2) The frequency of placing orders.

Solution :

$$1. \text{ EOQ} = \sqrt{\frac{2AB}{CS}} \quad \text{where :}$$

A = Annual usage of Material

B = Buying cost per order

C = Cost per unit

S = Storage and carrying cost % P.A.

- (a) Annual usage = 60 units per day \times 300 working days = 18,000 units
- (b) Buying Cost = Handling charges + Freight = 120 + 380 = Rs. 500

$$(c) \text{ Cost per unit} = \frac{\text{Cost per lot}}{\text{No. of units per lot}} = \frac{2,400}{240} = \text{Rs. } 10$$

(s) Storage and Carrying cost :

$$\text{Storage cost} = \text{Re. } 0.50 \text{ per unit per annum or } \frac{0.5}{10} \times 100 = 5\% \text{ per annum}$$

$$\text{Interest Cost} = 1.25\% \text{ per month or } 1.25 \times 12 = 15\% \text{ per annum.}$$

$$\therefore \text{Storage and carrying cost} = 5\% + 15\% = 20\% \text{ per annum.}$$

$$\text{EOQ} = \sqrt{\frac{2 \times 18,000 \times 500}{10 \times \frac{20}{100}}} = \sqrt{\frac{2 \times 18,000 \times 500}{2}} =$$

$$= \sqrt{90,00,000} = 3,000 \text{ Units}$$

\therefore No. of units to be ordered each time to minimise the overall inventory cost = 3,000 Units.

2. Frequency of placing orders :

$$\text{No. of orders per annum} = \frac{\text{Annual Consumption}}{\text{EOQ}}$$

$$= \frac{18,000}{3,000} = 6 \text{ orders}$$

$$\text{Frequency of orders} = \frac{\text{Days or Months in the year}}{\text{No. of orders per annum}}$$

$$= \frac{365}{6} = 60.8 \text{ (or) 61 days (or) } \frac{12}{6} = 2 \text{ months.}$$

Orders for 3000 units have to be placed once in every 61 days or approximately once in every 2 months.

(E) EOQ and Inventory Cost

Illustration 12

Following information relating to a type of raw material is available.

Annual demand 2,400 units

Unit price Rs. 2.40

Ordering cost per order Rs. 4

Storage cost 2% per annum

Interest Rate 10% per annum

Lead time half month.

Calculate economic order quantity and total amount of inventory cost in respect of the particular raw material.

Solution:

$$EOQ = \sqrt{\frac{2AB}{CS}}$$

$$= \sqrt{\frac{2 \times 2,400 \times 4}{(2.40 \times \frac{12}{100})}}$$

$$= \sqrt{\frac{2 \times 2,400 \times 4}{0.288}}$$

= 258 units (approximately)

Calculation of Total Inventory Cost

	Rs. P.
Purchase Cost = 2,400 × 2.40	5,760.00
Carrying Cost $(258 \times \frac{1}{2} \times 2.40 \times \frac{12}{100})$	37.15
Ordering Cost 9 orders @ Rs. 4 per order =	36.00
$\left(\frac{2,400 \text{ units}}{258 \text{ units}} = 9.3 \text{ orders or 9 orders} \right)$	
Total Inventory cost	<u>5,833.15</u>

Note: (1) Average inventory is taken as $\frac{1}{2}$ of the economic ordering quantity in the absence of specific data.

(2) 9.3 orders is rounded off to 9 orders.

(F) EOQ—Computation through different methods

Illustration 13

Calculate EOQ from the following information using: (i) Formula method (ii) Tabular method (iii) Graphic method (iv) Algebraic method :

- (a) Annual consumption of material : 600 units.
- (b) Ordering cost Rs. 12 per order.
- (c) Price per unit Rs. 20.
- (d) Carrying cost per annum 20%.

[B.Com. Bharathidasan Adapted]

Solution :

(i) Formula Method :

$$EOQ = \sqrt{\frac{2AB}{CS}}$$

where

A = Annual usage

B = Buying cost per order

C = Cost per unit

S = Storage and carrying cost % P.A.

$$EOQ = \sqrt{\frac{2 \times 600 \times 12}{20 \times \frac{20}{100}}}$$

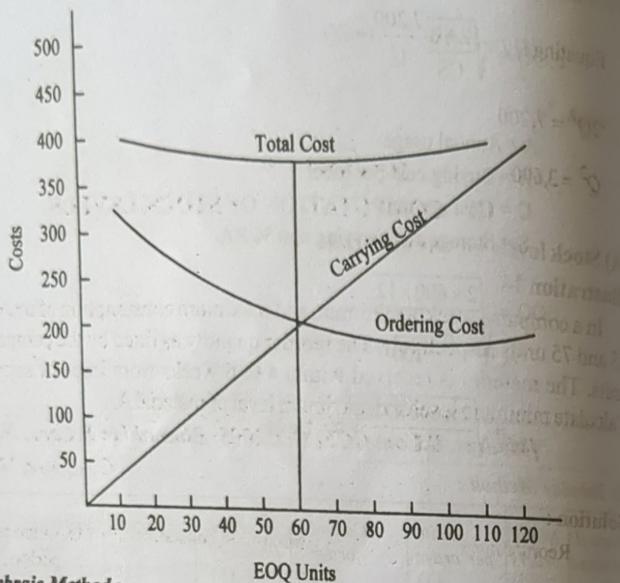
$$= \sqrt{\frac{2 \times 600 \times 12}{4}} = 60 \text{ Units}$$

(ii) Tabular Method :

Annual demand (1)	No. of orders (2)	Units per order (3)	Cost of order (4)	Average Inventory (5)	Carrying cost (6)	Ordering cost (7)	Total cost (8)				
							(3) = $\frac{(1)}{(2)}$	(4) = $(3) \times 20$	(5) = $\frac{(4)}{2}$	(6) = $(5) \times \frac{20}{100}$	(8) = (6) + (7)
600 units	1	600	12,000	6,000	1,200	12	1,212				
	2	300	6,000	3,000	600	24	624				
	3	200	4,000	2,000	400	36	436				
	4	150	3,000	1,500	300	48	348				
	5	120	2,400	1,200	240	60	300				
	6	100	2,000	1,000	200	72	272				
	7	86	1,720	860	172	84	256				
	8	75	1,500	750	150	96	246				
	9	67	1,340	670	134	108	242				
	10	60	1,200	600	120	120	240				
	11	54	1,100	550	110	132	242				
	12	50	1,000	500	100	144	244				

It can be observed from the table that when 10 orders are placed for 60 units each time, the total cost is the lowest. So, EOQ = 60 units per order.

(iii) Graphic Method :



(iv) Algebraic Method :

Let the EOQ be Q For Q units 1 orderFor 600 units $\frac{600}{Q}$ number of orders

Buying cost per order is Rs. 12

$$\text{For } \frac{600}{Q} \text{ orders} = \frac{600 \times 12}{Q} = \frac{7,200}{Q} \quad \dots \dots \dots (1)$$

$$\text{Average inventory} = \frac{Q}{2}$$

The total carrying cost of inventory for the period will be carrying cost per unit multiplied by average number of units for inventory.

Inventory carrying cost is 20% and cost per unit is Rs. 20. Storage cost is 20% of Rs. 20, i.e., Rs. 4. The total carrying cost is

$$4 \times \frac{Q}{2} = 2Q$$

$$\text{Equating (1) and (2)} \quad \frac{7,200}{Q} = 2Q$$

$$2Q^2 = 7,200$$

$$Q^2 = 3,600 \quad Q = \sqrt{3,600} = 60$$

III - COMPUTATION OF STOCK LEVELS

(A) Stock levels for one material

Illustration 14

In a company, weekly minimum and maximum consumption of material A are 25 and 75 units respectively. The reorder quantity as fixed by the company is 300 units. The material is received within 4 to 6 weeks from issue of supply order. Calculate minimum level and maximum level of material A.

[Madras, B.Com (ICE) Oct. 2005; Bharathiar, B.Com., Nov. 2004;
C.A. Inter, May 1995]

Solution :

$$\text{Reorder level} = \text{Maximum consumption} \times \text{Maximum reorder period}$$

$$= 75 \times 6 = 450 \text{ units}$$

$$\text{Maximum stock level} = \text{Reorder level} + \text{Reorder quantity} - (\text{Minimum consumption} \times \text{Minimum reorder period})$$

$$= 450 + 300 - (25 \times 4)$$

$$= 650 \text{ units}$$

$$\text{Minimum Stock level} = \text{Reorder level} - (\text{Normal Consumption} \times \text{Normal reorder period})$$

$$= 450 - \left(\frac{(25+75)}{2} \times \frac{(4+6)}{2} \right)$$

$$= 450 - (50 \times 5)$$

$$= 200 \text{ units}$$

where

$$\text{Normal Consumption} = \frac{\text{Maximum Consumption} + \text{Minimum Consumption}}{2}$$

where

$$\text{Normal reorder period} = \frac{\text{Maximum reorder period} + \text{Minimum reorder period}}{2}$$

Illustration 15

Material 'A' is used as follows :

- Maximum usage in a month 600 Units.
- Minimum usage in a month 400 Units.
- Average usage in a month 450 Units.

Lead time : Maximum 6 months, minimum 2 months.

Reorder Quantity : 1,500 Units.

Maximum reorder period for emergency purchases – 1 month

Calculate

- (a) Reorder level
- (b) Maximum level
- (c) Minimum level
- (d) Average stock level
- (e) Danger level

Solution :

The terms 'Lead-Time' and 'Reorder period' mean the same thing.

'Usage' and 'Consumption' are also used as alternative terms.

'Average' and 'normal' are used interchangeably.

$$\begin{aligned}
 (a) \text{ Reorder level} &= \text{Maximum consumption} \times \text{Maximum reorder period} \\
 &= 600 \text{ Units} \times 6 \text{ Months} \\
 &= 3,600 \text{ Units} \\
 (b) \text{ Maximum stock level} &= \text{Reorder level} + \text{Reorder quantity} - (\text{Minimum consumption} \times \text{minimum reorder period}) \\
 &= 3,600 + 1,500 - (400 \times 2) \\
 &= 5,100 - 800 = 4,300 \text{ units} \\
 (c) \text{ Minimum stock level} &= \text{Reorder level} - (\text{Normal Consumption} \times \text{Normal reorder period}) \\
 &= 3,600 - \left(450 \times \frac{(6+2)}{2} \right) \\
 &= 3,600 - (450 \times 4) \\
 &= 1,800 \text{ units}
 \end{aligned}$$

where

$$\text{Normal reorder period} = \frac{\text{Maximum Reorder period} + \text{Minimum reorder period}}{2}$$

$$\begin{aligned}
 (d) \text{ Average stock level} &= \frac{\text{Maximum stock level} + \text{Minimum stock level}}{2} \\
 &= \frac{4,300 + 1,800}{2} = 3,050 \text{ units}
 \end{aligned}$$

Average stock level is also calculated by using the following formula :

$$\begin{aligned}
 &= \text{Minimum stock level} + \frac{1}{2} \text{ of reorder quantity} \\
 &= 1,800 + \left(\frac{1}{2} \times 1,500 \right) \\
 &= 2,550 \text{ Units}
 \end{aligned}$$

However, the former method is more popular.

$$\begin{aligned}
 (e) \text{ Danger level} &= \text{Average consumption} \times \text{Maximum reorder period} \\
 &\quad \text{for emergency purchases} \\
 &= 450 \text{ units} \times 1 \text{ month} = 450 \text{ units.}
 \end{aligned}$$

(B) Stock levels for two or more materials**Illustration 16**

Two components A and B are used as follows :

Reordering quantity :	A 1,200 Units
	B 1,00 units
Reordering period	A 2 to 4 weeks
	B 3 to 6 weeks
Normal usage	— 300 units per week each
Minimum usage	— 150 units per week each
Maximum usage	— 450 units per week each

You are required to calculate the following for each of the components.

- (a) Reordering level
- (b) Maximum level
- (c) Minimum level
- (d) Average stock level.

[Periyar BCA/B.Sc., April/May 2004]

[Nagarjuna, B.Com. April 1993]

Solution :**Component A :**

$$\begin{aligned}
 (a) \text{ Reordering level} &= \text{Maximum consumption} \times \text{Maximum reorder period} \\
 &= 450 \times 4 = 1,800 \text{ units}
 \end{aligned}$$

$$\begin{aligned}
 (b) \text{ Maximum stock level} &= \text{Reorder level} + \text{Reordering quantity} - (\text{Minimum consumption} \times \text{minimum reorder period})
 \end{aligned}$$

$$= 1,800 + 1,200 - (150 \times 2)$$

$$= 2,700 \text{ units}$$

(c) *Minimum stock level* = Reorder level - (Normal consumption \times Normal reorder period)

$$= 1,800 - (300 \times 3)$$

$$= 900 \text{ units}$$

(d) *Average stock level* = Minimum stock level + $\frac{1}{2}$ of reorder quantity

$$= 900 + \left(\frac{1}{2} \times 1,200 \right)$$

$$= 900 + 600 = 1,500 \text{ units.}$$

(or)

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

$$= \frac{900 + 2,700}{2}$$

$$= 1,800 \text{ units}$$

Component B :

(a) *Reordering level* = Maximum consumption \times Maximum reorder period
 $= 450 \times 6 = 2,700 \text{ units}$

(b) *Maximum stock level* = Reorder level + Reorder quantity - (Minimum consumption \times minimum reorder period)
 $= 2,700 + 1,000 - (150 \times 3)$
 $= 3,250 \text{ units}$

(c) *Minimum stock level* = Reorder level - (Normal consumption \times Normal reorder period)
 $= 2,700 - (300 \times 4.5)$
 $= 1,350 \text{ units}$

(d) *Average stock level* = $\frac{\text{Minimum stock level} + \text{Maximum stock level}}{2}$

$$= \frac{3,250 + 1,350}{2}$$

$$= 2,300 \text{ units}$$

or

$$= \text{Minimum stock level} + \frac{1}{2} \text{ of reorder quantity}$$

$$(S \times O.R.) - 0.5 \times I + 0.5 \times I =$$

$$= 1,350 + \left(\frac{1}{2} \times 1,000 \right)$$

$$= 1,850 \text{ units}$$

Note : Average stock level differs when the alternative formulae are used.

Illustration 17

Two components X and Y are used as follows :

Minimum usage	: 50 units per week each
Maximum usage	: 150 units per week each
Normal usage	: 100 units per week each
Ordering quantities	: X - 600 units Y - 1,000 units
Delivery period	: X - 4 to 6 weeks Y - 2 to 4 weeks.

Maximum reorder period for emergency purchases X : 2 weeks Y : 2 weeks.

Calculate for each component:

- (a) Reordering level
- (b) Maximum level
- (c) Minimum level
- (d) Danger level

[Madras, B.C.A./B.Sc., Oct. 2001 (Double Fig.);

B.Sc.(ICE) Oct. 2000]

[C.A. Inter adapted]

Solution :

The terms 'Delivery period', 'Reorder period', 'Lead time', 'Time lag', etc., are used interchangeably. Similar is the case with the terms 'Usage' and 'Consumption'.

(a) *Re-order level* = Maximum consumption \times Maximum reorder period

$$\text{Component X} = 150 \text{ units} \times 6 \text{ weeks} = 900 \text{ units}$$

$$\text{Component Y} = 150 \text{ units} \times 4 \text{ weeks} = 600 \text{ units}$$

(b) *Maximum level* = Reorder level + Reorder Quantity - (Minimum consumption \times Minimum reorder period)

$$= 900 \text{ Units} + 600 \text{ units} - (50 \text{ units} \times 4 \text{ weeks})$$

$$= 1,500 - 200 = 1,300 \text{ units}$$

$$= 600 \text{ units} + 1,000 \text{ units} - (50 \text{ units} \times 2 \text{ weeks})$$

$$= 1,600 - 100 = 1,500 \text{ units}$$

(c) *Minimum stock level* = Reorder level - (Normal consumption \times Normal reorder period)

$$\begin{aligned} \text{Component X} &= 900 \text{ units} - (100 \text{ units} \times \frac{4+6}{2} \text{ weeks}) \\ &= 900 - 500 = 400 \text{ units} \end{aligned}$$

$$\begin{aligned} \text{Component Y} &= 600 \text{ units} - (100 \text{ units} \times \frac{2+4}{2} \text{ weeks}) \\ &= 600 - 300 = 300 \text{ units} \end{aligned}$$

(d) **Danger level** = Average Consumption \times Maximum reorder period for emergency purchases

$$\begin{aligned} \text{Component X} &= 100 \text{ units} \times 2 \text{ weeks} = 200 \text{ units.} \\ \text{Component Y} &= 100 \text{ units} \times 2 \text{ weeks} = 200 \text{ units} \end{aligned}$$

(c) Stock Levels and EOQ

Illustration 18

From the following information calculate

- (a) Economic order quantity
- (b) Reorder level
- (c) Maximum level
- (d) Minimum level

Normal usage 150 units per day. Minimum usage 100 units per day. Maximum usage 200 units per day. Reorder period 50 to 60 days. The annual usage is 50,000 units. The cost of purchase is Rs. 100 per order. Cost per unit is Re. 1.00. Carrying cost is 10% per annum.

Solution :

$$(a) \text{Economic ordering quantity : } \text{EOQ} = \sqrt{\frac{2AB}{CS}}$$

where A = Annual usage

B = Buying cost per order

C = Cost per unit

S = Storage and carrying cost % P.A.

$$\text{EOQ} = \sqrt{\frac{2 \times 50,000 \times 100}{1 \times \frac{10}{100}}} = \sqrt{10,00,00,000} = 10,000 \text{ units}$$

$$\begin{aligned} (b) \text{Re-order Level} &= \text{Maximum Consumption} \times \text{Maximum Reorder period} \\ &= 200 \text{ units} \times 60 \text{ days} \\ &= 12,000 \text{ units} \end{aligned}$$

$$(c) \text{Maximum level} = \text{Reorder level} + \text{Reorder Quantity} - (\text{Minimum Consumption} \times \text{Minimum Reorder period})$$

$$\begin{aligned} &= 12,000 \text{ units} + 10,000 \text{ units} - (100 \text{ units} \times 50 \text{ days}) \\ &= 22,000 - 5,000 \\ &= 17,000 \text{ units} \end{aligned}$$

(d) **Minimum level** = Reorder level - (Normal consumption \times Normal Reorder period)

$$\begin{aligned} &= 12,000 \text{ units} - \left(150 \text{ units} \times \frac{50+60}{2} \text{ days} \right) \\ &= 12,000 - 8,250 \\ &= 3,750 \text{ units.} \end{aligned}$$

(D) Ordering Quantity from given levels

Illustration 19

The following information is available in respect of component D20:

Maximum stock level	42,000 units
Budgeted consumption	Maximum 7,500 units per month Minimum 4,000 units per month
Estimated delivery period	Maximum 4 months Minimum 2 months

You are required to calculate :

- (1) re-order level
- (2) re-order quantity

Solution :

$$\begin{aligned} (1) \text{Reorder level} &= \text{Maximum consumption} \times \text{Maximum Reorder period} \\ &= 7,500 \times 4 \\ &= 30,000 \text{ units} \end{aligned}$$

(2) Reorder quantity is derived from maximum stock level as follows:

Maximum stock level	= Reorder level + Reorder Quantity - (Minimum consumption \times Minimum reorder period)
42,000	= 30,000 + ROQ - (4,000 \times 2)
42,000	= 30,000 + ROQ - 8,000
42,000 - 22,000	= ROQ
ROQ	= 20,000 units
Reorder Quantity	= 20,000 units.

IV. PRICING OF MATERIAL ISSUES**(A) First in First out method (FIFO) (Without Returns and Losses)****Illustration 20**

From the particulars given below write up the stores ledger card :

2007		
January	1	Opening stock 1,000 units at Rs. 26 each
	5	Purchased 500 units at Rs. 24.50 each.
	7	Issued 750 units.
	10	Purchased 1,500 units at Rs. 24 each
	12	Issued 1,100 units
	15	Purchased 1,000 units at Rs. 25 each
	17	Issued 500 units
	18	Issued 300 units
	25	Purchased 1,500 units at Rs. 26 each
	29	Issued 1,500 units

Adopt the FIFO method of issue and ascertain the value of the closing stock.

[Madras, B.Com (PZ5A) Ap 2007; B.A. Corp., Sept. 1988]

Solution :**Stores Ledger Account**

FIFO Method

Name : _____	Maximum level : _____	Folio No. _____
Code No.: _____	Minimum level : _____	Bin.No. _____
Description : _____	Reorder level : _____	Location code : _____
Reorder quantity : _____		

Date	Particulars or Reference	Receipts			Issues			Balance		
		Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.
2007										
Jan. 1	Balance									
	B/d									
5	G.R.N. No.	500	24.50	12,250				1,000	26.00	26,000
								1,000	26.00	26,000
7	M.R. No.				750	26.00	19,500	250	26.00	6,500
								500	24.50	12,250
10	G.R.N. No.	1,500	24.00	36,000				250	26.00	6,500
								500	24.50	12,250
								1,500	24.00	36,000
								250	26.00	6,500
								500	24.50	12,250
								350	24.00	8,400
								1,150	24.00	27,600
12	M.R. No.				1,100					
15	G.R.N. No.	1,000	25.00	25,000				1,150	24.00	27,600
								1,000	25.00	25,000
17	M.R. No.				500	24.00	12,000	650	24.00	15,600
								1,000	25.00	25,000
18	M.R. No.				300	24.00	7,200	350	24.00	8,400
								1,000	25.00	25,000
25	G.R.N. No.	1,500	26.00	39,000				350	24.00	8,400
								1,000	25.00	25,000
								1,500	26	39,000
								350	24.00	8,400
								1,000	25.00	25,000
								150	26.00	3,900
29	M.R. No.				1,350			1,350	26.00	35,100
								1,500		

Closing stock 1,350 units at Rs. 26 each = Rs. 35,100

Note : G.R.N. No. = Goods Received note number.

M.R. No. = Material Requisition Number.

(B) Last in first out method (LIFO) (Without Returns and Losses)

Illustration 21

Prepare stores ledger account under LIFO method from the information given in Illustration 1 above.

Solution :

Stores Ledger Account

LIFO Method

Name : _____ Maximum level : _____ Folio No. _____
 Code No.: _____ Minimum level : _____ Bin.No. _____
 Description : _____ Reorder level : _____ Location code : _____

Date	Receipts			Issues			Balance			
	or Reference	Qty. Units	Rcde Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.
2007										
Jan.1	Balance									
5	B/d									
	G.R.N. No.	500	24.50	12,250				1,000	26.00	26,000
								1,000	26.00	26,000
					500	24.50	12,250	500	24.50	12,250
					250	26.00	6,500	750	26.00	19,500
7	M.R. No.				750					
10	G.R.N. No.	1,500	24.00	36,000				750	26.00	19,500
12	M.R. No.							1,500	24.00	36,000
15	G.R.N. No.	1,000	25.00	25,000				750	26.00	19,500
								400	24.00	9,600
								750	26.00	19,500
								400	24.00	9,600
17	M.R. No.							1,000	25.00	25,000
					500	25.00	12,500	750	26.00	19,500
								400	24.00	9,600
18	M.R. No.							500	25.00	12,500
								750	26.00	19,500
								400	24.00	9,600
								200	25.00	5,000
25	G.R.N. No.	1,500	26.00	39,000				750	26.00	19,500
								400	24.00	9,600
								200	25.00	5,000
29	M.R. No.							1,500	26.00	39,000
								750	26.00	19,500
								400	24.00	9,600
								200	25.00	5,000

Closing Stock = 1,350 units, valued at Rs. 34,100 ($750 \times 26 + 400 \times 24 + 200 \times 25$)

Note : G.R.N. No. = Goods Received Note Number; M.R. No. = Material Requisition Number.

(C) FIFO Method (With Returns and Losses of Material)

Illustration 22

Draw a stores ledger card recording the following transactions under

(a) FIFO method and (b) LIFO method.

- 2010 July 1 Opening stock 2,000 unit at Rs. 10 each
 5 Received 1,000 units at Rs. 11 each
 6 Issued 500 units
 10 Received 5,000 units at Rs. 12 each.
 12 Received back 50 units out of the issue made on 6th July.
 14 Issued 600 units.
 18 Returned to supplier 100 units out of goods received on 5th.
 19 Received back 100 units out of the issue made on 14th July.
 20 Issued 150 units.
 25 Received 500 units at Rs. 14 each.
 28 Issued 300 units.

The stock verification report reveals that there was a shortage of 10 units on 18th July and another shortage of 15 units on 26th July.

Solution :

Stores Ledger Account

FIFO Method

Name : _____ Maximum level : _____ Folio No. _____
 Code No.: _____ Minimum level : _____ Bin.No. _____
 Description : _____ Reorder level : _____ Location code : _____
 Reorder quantity : _____

Date	Receipts			Issues			Balance			
	Particulars or Reference	Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.
2010										
Jul.1	Balance									
	B/d									
5	G.R.N. No.	1,000	11	11,000				2,000	10	20,000
								2,000	10	20,000
6	M.R. No.							500	10	5,000
								1,500	10	15,000
10	G.R.N. No.	5,000	12	60,000				1,000	11	11,000
								1,500	10	15,000
								1,000	11	11,000
								5,000	12	60,000

12	Mat. Retd. Note No.	50	10	500	100	11	11	100	10	1,500	10	15,000	
										1,000	11	11,000	
										5,000	12	60,000	
										50	10	500	
14	M.R. No.			600	10	6,000	900		10	9,000			
										1,000	11	11,000	
										5,000	12	60,000	
										50	10	500	
18	Debit Note No. Shortage			100	11	1,100	890		10	8,900			
					10	10	100	900		11	9,900		
										5,000	12	60,000	
										50	10	500	
19	Mat. Retd. Note. No.	100	10	1,000						890	10	8,900	
										900	11	9,900	
										5,000	12	60,000	
										50	10	500	
20	M.R. No.			150	10	1,500	740		10	7,400			
										900	11	9,900	
										5,000	12	60,000	
										50	10	500	
25	G.R.N. No.	500	14	7,000						100	10	1,000	
										740	10	7,400	
										900	11	9,900	
										5,000	12	60,000	
										50	10	500	
										100	10	1,000	
26	Shortage			15	10	150	725		10	7,250			
										900	11	9,900	
										5,000	12	60,000	
										50	10	500	
										100	10	1,000	
										500	14	7,000	
28	M.R. No.			300	10	3,000	425		10	4,250			
										900	11	9,900	
										5,000	12	60,000	
										50	10	500	
										100	10	1,000	
										500	14	7,000	

Materials

3.73

Closing Stock = 6,975 units, valued at Rs. 82,650

 $(425 \times 10 + 900 \times 11 + 5,000 \times 12 + 50 \times 10 + 100 \times 10 + 500 \times 14)$

- Note:**
1. G.R.N. No. — Goods Received Note Number.
 2. M.R. No. — Material Requisition Number, Mat. Retd. Note = Material Returned Note.
 3. Debit Note is sent to suppliers when materials are returned.
 4. Shortage is treated like an issue and priced as per the method of pricing in operation.
 5. Returns from departments are treated just like fresh receipts at the price at which the original issue was made. Its reissue will be as per the method followed. An alternative treatment is to issue the returned material as the 'first out' (or) irrespective of the method of pricing, issuing it as 'next issue' whenever an issue is made.
 6. Returns to supplier are like an issue, at the rate at which the original purchase was made.

(D) LIFO Method (With returns and Losses of Material)

Illustration 23

Prepare stores ledger account under LIFO Method from the information given in Illustration 3 above.

Solution :

Name : _____	Maximum level : _____	Folio No. _____
Code No. : _____	Minimum level : _____	Bin.No. _____
Description : _____	Reorder level : _____	Location code : _____
	Reorder quantity : _____	

Date	Particulars or Reference	Receipts			Issues			Balance	
		Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.
2010									
Jul. 1	Balance							2,000	10 20,000
	B/d							2,000	10 20,000
5	G.R.N. No. 1,000	11	11,000					1,000	11 11,000
6	M.R. No.	500	11	5,500	500	11	5,500	2,000	10 20,000
10	G.R.N. No. 5,000	12	60,000					500	11 5,500
								2,000	10 20,000
								500	11 5,500
								5,000	12 60,000

12	Mat. Retd. Note. No.	50	11	550		2,000	10	20,000		
						500	11	5,500		
						5,000	12	60,000		
						50	11	550		
14	M.R. No.			50	11	550	2,000	10	20,000	
				550	12	6,600	500	11	5,500	
							4,450	12	53,400	
						600				
18	Debit Note No.			100	11	1,100	2,000	10	20,000	
	Shortage			10	12	120	400	11	4,400	
							4,440	12	53,280	
19	Mat. Retd. Note No.	100	12	1,200		2,000	10	20,000		
						400	11	4,400		
						4,440	12	53,280		
20	M.R. No.			100	12	1,200	2,000	10	20,000	
				50	12	600	400	11	4,400	
							4,390	12	52,680	
25	G.R.N. No.	500	14	7,000		150				
						2,000	10	20,000		
						400	11	4,400		
						4,390	12	52,680		
26	Shortage				15	14	210	2,000	10	20,000
							400	11	4,400	
							4,390	12	52,680	
							485	14	6,790	
28	M.R. No.			300	14	4,200	2,000	10	20,000	
							400	11	4,400	
							4,390	12	52,680	
							185	14	2,590	

Closing stock = 6,975 units, valued at Rs. 79,670

$$(2,000 \times 10 + 400 \times 11 + 4,390 \times 12 + 185 \times 14)$$

Note :

1. G.R.N. No. = Goods Received Note Number
- M.R. No. = Material Requisition Number
- Mat. Retd. Note No. = Material Returned Note Number

2. There are two quantities at two prices in the issue of 14th July. The return of 100 units are assumed as out of the issue of 550 units at Rs. 12.
3. Shortage is treated just like an issue on that date.

(E) Specific Price – With LIFO

Illustration 24

Using information given, draft stores ledger account showing quantities and value of receipts, issues and balance in hand under LIFO method of pricing stores issues.

- | | | |
|---------|---|---|
| Jan. 1 | - | Balance in hand 1,000 units Re. 1 each. |
| Jan. 4 | - | Received 500 units to be issued on request from Dept. X, Rate Rs. 2 each. |
| Jan. 15 | - | Received 3,000 units costing Rs. 3,300 |
| Jan. 30 | - | Issued 2,000 units |
| Feb. 8 | - | Issued 500 units (Received on Jan. 4) to Dept. X |
| Feb. 12 | - | Received 2,000 units costing Rs. 2,400 |
| Feb. 27 | - | Issued 3,400 units. |

[Madras, B.Com. Sept. 1989 Adapted]

Solution :

Stores Ledger Account (Specific price with LIFO Method)

Name : _____	Maximum level : _____	Folio No. _____
Code No.: _____	Minimum level : _____	Bin.No. _____
Description : _____	Reorder level : _____	Location code : _____
	Reorder quantity : _____	

Date	Particulars or Reference	Receipts			Issues			Balance		
		Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.
Jan.1	Balance									
	B/d									
4	G.R.N. No.	500	2	1,000				1,000	1.00	1,000
15	G.R.N. No.	3,000	1.10	3,300				1,000	1.00	1,000
								500	2.00	1,000
								1,000	1.00	1,000
								500	2.00	1,000
								3,000	1.10	3,300
30	M.R. No.				2,000	1.10	2,200	1,000	1.00	1,000
								500	2.00	1,000
								1,000	1.10	1,100

Cost Accounting										
Feb. 8	M.R. No.			500	2.00	1,000	1,000	1.00	1,000	
Feb. 12	GR.N. No.	2,000	1.20	2,400			1,000	1.10	1,100	
							1,000	1.00	1,000	
							1,000	1.10	1,100	
							2,000	1.20	2,400	
				2,000	1.20	2,400	600	1.00	600	
				1,000	1.10	1,100				
				400	1.00	400				
Feb. 27	M.R. No.			3,400						

Closing Stock = 600 units valued at Rs. 600 (600×1)

Note : 1. G.R.N. No. = Goods received note number

M.R. No. = Material requisition number.

2. The purchase on Jan. 4 i.e., 500 units at Rs. 2 is meant for Dept. X. It is 'specific purchase' at that 'Specific Price'. It is issued to that department on Feb. 8th.

(F) Base Stock Method – with FIFO

Illustration 25

From the following particulars prepare the stores ledger account showing the pricing of materials issue, by adopting the FIFO method, with base stock of 400 units, out of opening stock.

2010 December

- 1 Opening stock 1,000 units at Rs. 2.00 each.
- 3 Purchased 800 units at Rs. 2.10
- 5 Issued 800 units
- 12 Purchased 1,600 units at Rs. 2.10 each.
- 17 Issued 1,500 units
- 20 Purchased 900 units at Rs. 2.50 each.
- 25 Issued 600 units.

[Madras, B.Com., March 1991 Adapted]

Cost Accounting											
Materials											
Solution											
2010											
Dec. 1	Balance B/d										
3	GR.N. No.	800	2.10	1,680							
5	M.R. No.				600	2.00	1,200	400	2.00	800	
					200	2.10	420	600	2.10	1,260	
12	GR.N. No.	1,600	2.10	3,360							
					800						
17	M.R. No.					1,500	2.10	3,150	400	2.00	800
						700			700	2.10	1,470
20	GRN No.	900	2.50	2,250							
					600	2.10	1,260	400	2.00	800	
					100			900	2.50	2,250	
25	M.R. No.								100	2.10	210
									900	2.50	2,250
Closing Stock = 1,400 units, valued at Rs. 3,260 ($400 \times 2 + 100 \times 2.10 + 900 \times 2.5$)											

Note :

1. G.R.N. No. = Goods Received note number.
M.R. No. = Material Requisition Number.
2. The base stock of 400 units at Rs. 2 each set aside from the opening stock continues to remain in the Balance column as a part of stock. For making issues that quantity is not considered.

(G) Highest in First out method (HIFO)

Illustration 26

Laxmi and Co. has purchased and issued material D as under.

2010

- May 1 Opening stock 2,000 units at Rs. 5 per unit
- 3 Purchased 500 units at Rs. 6 per unit
- 5 Purchased 700 units at Rs. 6.5 per unit
- 10 Issued 800 units
- 11 Purchased 300 units at Rs. 8 per unit
- 15 Purchased 200 units at Rs. 7 per unit
- 18 Issued 400 units
- 25 Purchased 200 units at Rs. 9 per unit
- 28 Purchased 150 units at Rs. 8.5 per unit
- 30 Issued 200 units.

Ascertain the closing stock value under HIFO method of pricing of issues.

Solution :

**Stores Ledger Account
(HIFO Method)**

Name : _____
Code No. : _____
Description : _____

Maximum level : _____ Folio No. _____
Minimum level : _____ Bin.No. _____
Reorder level : _____ Location code : _____
Reorder quantity : _____

Date	Particulars or Reference	Receipts			Issues			Balance		
		Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.
2010										
May 1	Balance B/d									
3	G.R.N. No.	500	6.00	3,000				2,000	5.00	10,000
								2,000	5.00	10,000
5	G.R.N. No.	700	6.50	4,550				500	6.00	3,000
								2,000	5.00	10,000
10	M.R. No.				700	6.50	4,550	700	6.5	4,550
					100	6.00	600	400	6.00	2,400
11	G.R.N. No.	300	8.00	2,400				800	8.00	2,400
								2,000	5.00	10,000
								400	6.00	2,400
								300	8.00	2,400
								200	7.00	1,400

Materials

15	G.R.N. No.	200	7.00	1,400				2,000	5.00	10,000
								400	6.00	2,400
								300	8.00	2,400
								200	7.00	1,400
18	M.R. No.				300	8.00	2,400	400	6.00	2,400
					100	7.00	700	100	7.00	700
25	G.R.N. No.	200	9.00	1,800				2,000	5.00	10,000
					400			400	6.00	2,400
					100			100	7.00	700
					200			200	9.00	1,800
28	G.R.N. No.	150	8.50	1,275				2,000	5.00	10,000
					400			400	6.00	2,400
					100			100	7.00	700
30	M.R. No.				200	9.00	1,800	2,000	5.00	10,000
					400			400	6.00	2,400
					100			100	7.00	700
					150			150	8.50	1,275

Closing Stock = 2,650 units valued at Rs. 14,375

($2,000 \times 5 + 400 \times 6 + 100 \times 7 + 150 \times 8.5$)

Note :

1. G.R.N. No. = Goods received note number.
M.R. No. = Material requisition number.
2. Every issue in this method is priced at the highest rate or rates existing in the Balance column on that date.

(H) Simple Average Method

Illustration 27

From the following particulars, prepare stores ledger by adopting simple average method of pricing of material issues.

Date	Receipts	Issues
2010 Jan. 1	300 units at Rs. 10 per unit	
10	200 unit at Rs. 12 per unit	
12	400 units at Rs. 11 per unit	250 units
15		150 units
16		
18	200 units at Rs. 14 per unit	300 units
20		
22	300 units at Rs. 15 per unit	
25	100 units at Rs. 16 per unit	200 units
27		100 units
31		

[Madras, B.A. Corp., March 1992 Adapted]

Solution:**Stores Ledger Account**

(Simple Average Method)

Name : _____

Maximum level : _____ Folio No. _____

Code No. : _____

Minimum level : _____ Bin.No. _____

Description : _____

Reorder level : _____ Location code : _____

Reorder quantity : _____

Date	Particulars or Reference	Receipts			Issues			Balance		
		Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.
2010										
Jan. 1	G.R.N.									
	No.	300	10	3,000						
10	G.R.N.									
	No.	200	12	2,400						
12	G.R.N.									
	No.	400	11	4,400						
15	M.R. No.				250	11	2,750	650	10.8888	7,050
					$\left(\frac{10+12+11}{3}\right)$					
16	M.R. No.				150	11	1,650	500	10.8888	5,400
					$\left(\frac{10+12+11}{3}\right)$					
18	G.R.N.									
	No.	200	14	2,800						
20	M.R. No.				300	12.33	3,699	400	11.7786	4,501
					$\left(\frac{12+11+14}{3}\right)$					
22	G.R.N.									
	No.	300	15	4,500						
25	G.R.N.									
	No.	100	16	1,600						
27	M.R. No.				200	14	2,800	600	13.5137	10,601
					$\left(\frac{11+14+15+16}{4}\right)$					
31	M.R. No.				100	15	1,500	500	13.5137	6,301
					$\left(\frac{14+15+16}{3}\right)$					

Materials

Closing stock = 500 units valued at Rs. 6,301.

Note: Though simple average of prices of the lots in stock is taken for issue purpose, 'FIFO' is inherent in simple average method.

So, whenever the older stocks are exhausted physically, their prices are also omitted while calculating simple average of prices.

For example : With the issue on 16th Jan, the first lot purchased on Jan. 1 is physically exhausted. So, the price of Rs. 10 is omitted when issue price is computed next time on Jan. 20.**(1) Weighted Average Method (Without Returns and Losses)****Illustration 28**

Prepare stores Ledger Account under weighted average method from the information given in Illustration 8 above.

[Madras, B.Com., C&M Oct. 2001]

Solution :**Stores Ledger Account
(Weighted Average Method)**

Name : _____

Folio No. _____

Code No.: _____

Bin.No. _____

Description : _____

Location code : _____

Reorder quantity : _____

Date	Particulars or Reference	Receipts			Issues			Balance		
		Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.
2010										
Jan. 1	G.R.N. No.	300	10	3,000						
10	G.R.N. No.	200	12	2,400						
12	G.R.N. No.	400	11	4,400						
15	M.R. No.				250	10.8888	2,722	650	10.8888	7,078
16	M.R. No.				150	10.88	1,633	500	10.8888	5,445
18	G.R.N. No.	200	14	2,800						
20	M.R. No.	300	12.33	3,699	400	11.7786	3,534	400	11.7786	4,711
22	G.R.N. No.	300	15	4,500						
25	G.R.N. No.	100	16	1,600						
27	M.R. No.				200	14	2,800	600	13.5137	10,601
31	M.R. No.				100	15	1,500	500	13.5137	6,301

Closing stock is 500 units valued at Rs. 6,757.

Note : New price is calculated and shown in the Balance column whenever there is a fresh receipt of material.

(J) Weighted Average Method (With Returns and Losses)

Illustration 29

Prepare a stores ledger account using weighted average method of pricing the issue of materials.

2010

- March 1 Balance 1,000 units @ Rs. 70 per unit
 3 Purchased 2,000 units @ Rs. 80 per unit
 5 Issued 500 units
 10 Issued 1,000 units
 15 Purchased 2,000 units at Rs. 80 per unit
 18 Issued 400 units
 20 Received back 25 units out of the issue made on 5th March.
 22 Issued 1,500 units
 24 Returned to supplier 30 units out of the purchases made on 15th March.
 25 Purchased 1,000 units at Rs. 75 per unit.
 30 Issued 1,000 units.

Physical verification on 21st March revealed a shortage of 15 units and 20 units shortage on 30th March.

Materials

Solution :

Stores Ledger Account
(Weighted Average Method)

Name : _____ Maximum level : _____ Folio No. _____
 Code No.: _____ Minimum level : _____ Bin.No. _____
 Description : _____ Reorder level : _____ Location code : _____
 Reorder quantity : _____

Date	Particulars or Reference	Qty. Units	Receipts		Issues		Balance		
			Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.
2010									
Mar. 1	Balance								
	B/d								
3	G.R.N. No.	2,000	80	160,000					
5	M.R. No.				500	76.667	38,333	2,500	76.667
10	M.R. No.				1,000	76.667	76,667	1,500	76.667
15	G.R.N. No.	2,000	80	160,000					
18	M.R. No.				400	78.571	31,428	3,100	78.571
20	Mat. Retd.								
	Note No.	25	76.667	1,917					
21	Shortage				15	78.556	1,178	3,110	78.556
22	M.R. No.				1,500	78.556	117,834	1,610	78.556
24	Debit								
	Note No.				30	80	2,400	1,580	78.5297
25	G.R.N. No.	1,000	75	75,000					
30	M.R. No.				1,000	77.16	77.160	1,560	77.16
	Shortage				20	77.16	1,543		1,20,374

(K) Standard Price Method

Illustration 30

The standard price of a Material is fixed at Rs. 14 per unit. Prepare the stores ledger account showing pricing of Material issues under standard price method.

2010

- | | | |
|---------|-----------------|------------------------------|
| March 1 | Opening balance | 2,000 units Rs. 14 per unit |
| 5 | Received | 500 units Rs. 15 per unit |
| 7 | Issued | 1000 units |
| 10 | Issued | 200 units |
| 12 | Received | 800 units at Rs. 13 per unit |
| 14 | Issued | 1,200 units |
| 18 | Issued | 400 units |

20	Received	600 units at Rs. 16 per unit
26	Issued	200 units
28	Received	200 units at Rs. 12 per unit
30	Issued	100 units.

Solution :

Stores Ledger Account
(Weighted Average Method)

Name : _____

Maximum level : _____

Folio No. _____

Code No.: _____

Minimum level : _____

Bin.No. _____

Description : _____

Reorder level : _____

Location code : _____

Reorder quantity : _____

Date	Particulars or Reference	Receipts			Issues			Balance		
		Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.
2010										
Mar. 1										
	B/d									
5	G.R.N. No.	500	15	7,500				2,000	14	28,000
7	M.R. No.				1,000	14	14,000	1,500		35,500
10	M.R. No.				200	14	2,800	1,300		21,500
12	G.R.N. No.	800	13	10,400				2,100		18,700
14	M.R. No.				1,200	14	16,800	900		29,100
18	M.R. No.				400	14	5,600	500		12,300
20	G.R.N. No.	600	16	9,600				1,100		16,300
26	M.R. No.				200	14	2,800	900		13,500
28	G.R.N. No.	200	12	2,400				1,100		15,900
30	M.R. No.				100	14	1,400	1,000		14,500

$$\begin{aligned} \text{Material Price Variance} &= (\text{Closing stock units} \times \text{Standard Price}) - \text{Closing stock value} \\ &= (1,000 \times 14) - 14,500 \\ &= 14,000 - 14,500 = \text{Rs. } 500 \text{ (Unfavourable)} \end{aligned}$$

(L) Standard Price Method**(Calculation of Standard Price and Material Price Variance)****Illustration 31**

Prepare the stores ledger account showing how issues and closing stock balance will be recorded under standard price method. The debit balance of Material variance is 1,000 on 1st November 2010. The following are the purchases and issues made during November 2010.

			Quantity	Rate
	1	Opening balance	1,000 units	11
	4	Purchased	500 units	12
	5	Purchased	400 units	13
	6	Issued	800 units	
	7	Issued	400 units	
	10	Purchased	1,000 units	14
	18	Issued	700 units	
	20	Issued	200 units	
	25	Purchased	400 units	11
	29	Issued	300 units	

Calculate the Material price variance at the end of November 1998.

Solution :

Stores Ledger Account
(Standard Price Method)

			Maximum level : _____	Folio No. _____
			Minimum level : _____	Bin.No. _____
			Reorder level : _____	Location code : _____
			Reorder quantity : _____	

Date	Particulars or Reference	Receipts			Issues			Balance		
		Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.	Qty. Units	Rate Rs.P.	Amount Rs.
2010										
Nov. 1	Balance									
	B/d									
4	G.R.N. No.	500	12	6,000				1,000	11	11,000
5	G.R.N. No.	400	13	5,200				1,500		17,000
6	M.R. No.				800	12	9,600	1,100		22,200
7	M.R. No.				400	12	4,800	700		12,600
10	G.R.N. No.	1,000	14	14,000				1,700		21,800
18	M.R. No.				700	12	8,400	1,000		13,400
20	M.R. No.				200	12	2,400	800		11,000
25	G.R.N. No.	400	11	4,400				1,200		15,400
29	M.R. No.				300	12	3,600	900		11,800

$$\text{Standard Price} = \frac{\text{Opening stock value} + \text{Debit balance of Material variance}}{\text{Opening balance in units}}$$

$$= \frac{11,000 + 1,000}{1,000} = \text{Rs.} 12$$

$$\text{Material Price variance} = (\text{Closing balance in units} \times \text{Standard price}) - \text{Closing balance in value}$$

$$= (900 \times 12) - 11,800$$

$$= 10,800 - 11,800 = 1,000 \text{ (Adverse)}$$

(M) Inflated Price Method

Illustration 32

A manufacturer of Surat purchased three Chemicals A, B and C from Bombay. The invoice gave the following information.

	Rs.
Chemical A 3,000 Kg. @ Rs. 4.20 per Kg.	12,600
Chemical B 5,000 Kg. @ Rs. 3.80 per Kg.	19,000
Chemical C 2,000 Kg. @ Rs. 4.75 per Kg.	9,500
Sales Tax	2,055
Railway Freight	1,000
Total Cost	44,155

A shortage of 200 Kgs. in Chemical A of 280 Kgs. in Chemical B and 100 Kgs. in Chemical C was noticed due to breakages. At Surat, the manufacturer paid Octroi duty @ Re. 0.10 per Kg. He also paid Cartage of Rs. 22 for chemical A. Rs. 63.12 for chemical B and Rs. 31.80 for chemical C. Calculate the stock rate that you would suggest for pricing of chemicals assuming a provision of 5% towards further deterioration.

[C.A. Inter, Nov. 1991]

Solution :

Statement showing Computation of inflated price

Particulars	Chemical A Rs.	Chemical B Rs.	Chemical C Rs.
Cost of chemicals	12,600	19,000.00	9,500.00
Sales tax (on the basis of value)	$2,055 \times \frac{12,600}{41,100} = 630$	$2,055 \times \frac{19,000}{41,100} = 950.00$	$2,055 \times \frac{9,500}{41,100} = 475.00$
Freight			
(Weight ratio)	$1,000 \times \frac{3}{10} = 300$	$1,000 \times \frac{5}{10} = 500.00$	$1,000 \times \frac{2}{10} = 200.00$
Octroi	3,000 \times 0.10 = 300	5,000 \times 0.10 = 500.00	2,000 \times 0.10 = 200.00
Cartage	22	63.12	31.80
Total cost I	13,852	21,013.12	10,406.80
Weight	3,000 kg	5,000 kg	2,000 kg
Less : Shortage	200 kg	280 kg	100 kg
	2,800 kg	4,720 kg	1,900 kg
Less : Further deterioration at 5%	140	236	95
Net weight II	2,660	4,484	1,805
Cost per kg I	13,852	21,013.12	10,406.8
II	2,660 = 5.208	4,484 = 4.686	1,805 = 5.766

(N) Inventory valuation under different methods

Illustration 33

A manufacturing company does not maintain a perpetual inventory of its Material, which it buys and issues. The physical inventory revealed the following information on Sept. 30, 2008 :

200 units at Rs. 20 per unit.

The following purchases were made during October 2008.

5th	500 units at	Rs. 22 per unit
8th	400 units at	Rs. 23 per unit
10th	600 units at	Rs. 19 per unit
15th	300 units at	Rs. 21 per unit
25th	400 units at	Rs. 20 per unit

On 30th October the physical stock was 900 units. Find out the value of stock on 30th October under : FIFO, LIFO and average methods.

Solution :**(a) First in First out Method : Valuation of stock on 30-10-2008**

Physical stock on 31st October is 900 units composed of the following lots on the principle that material received first has been issued first.

	Rs.
10th October's lot balance	200 units @ Rs. 19 per unit
15th October's full lot	300 units @ Rs. 21 per unit
25th October's full lot	400 units @ Rs. 20 per unit
Stock on 31-10-2008 =	<u>900 units valued at</u>
	<u>18,100</u>

(b) Last in First out method : Valuation of stock on 30-10-2008

Physical stock on 31st October is 900 units, composed of the following on the principle that later purchases are used first :

	Rs.
30th September lot unused	200 units at Rs. 20 per unit
5th October's lot unused	500 units at Rs. 22 per unit
8th October lots' balance	200 units at Rs. 19 per unit
Stock on 31-10-2008 =	<u>900 units valued at</u>
	<u>18,800</u>

(c) Average cost method : Valuation of stock on 30-10-2008

Physical stock on 30th October is 900 units composed of the lots of 10th October, 15th October and 25th October for valuation of stock.

$$\begin{aligned} & \text{600 units at Rs. 19 + 300 units at Rs. 21 + 400 units at Rs. 20} \\ & = \frac{600 + 300 + 400}{600 + 300 + 400 \text{ units}} \\ & = \text{Rs. 19.769 per Kg.} \end{aligned}$$

Closing stock value = 900 units \times 19.769 = Rs. 17,792

1002-01-0 Theory Questions :**(A) Short Answer Questions :**

- What is 'Material Control'?
- What are the objects of material control?
- List out the advantages of material control.
- What are the departments involved in organisation for material control?
- What is 'centralised purchasing'?
- What do you understand by 'Decentralised purchasing'?
- List out the objectives of purchasing department.
- What is Inventory control?
- What is 'Bincard'?

[Madras, B.Com., Nov. 2007; April 2007]

- Distinguish between 'Bincard' and 'Stores ledger'.

[Madras, B.Com(CS) Nov. 2007; B.C.S. April 2003]

- Explain Perpetual Inventory system.

[Madras, B.Com(CS) April 2008; B.C.S. Oct. 2001]

- What are the methods adopted to control inventory?

[Madras, B.Com. April 2001]

- Write a note on EOQ.

[Madras, B.Com. April 2002]

- What is EOQ? How is it useful?

[Madras, B.Com(CS) Nov. 2007; B.Com. April 2001]

- What is the significance of EOQ?

[Madras, B.Com(CS) April; B.Com., Ap 2007; B.Com.(ICE) May 2001; May 2000]

- Write a note on ABC analysis.

[Madras, B.Com.(CS) April 2008; Nov. 2007; April 2006;
B.Com. Ap 2007; April 2004; B.Com.(ICE) Oct. 2002]

- How do you classify materials into categories A, B & C?

- What is the significance of fixing 'Stock levels'?

- Explain the concepts of maximum level and reordering level.

[Madras, B.Com., April 2008; B.Com. (CS) Nov. 2006; B.C.S.(ICE) May 2001]

- Distinguish between Dangerous level and Minimum level of inventories.

[Madras, 1st M.Com., Nov. 2006]

- What is JIT purchasing?

- What is VED Analysis?

- Describe the 'Automatic order system'.

- Explain 'ordering cycle method' of Inventory control.

- What is 'Min-max' method of Inventory control?

- What is Inventory Turnover Ratio?

[Madras, B.Com(CS) Nov. 2007]

- Explain 'Input-Output Ratio Analysis'.

- Describe FNSD Analysis.

29. What do you understand by 'pricing of material issues'?
30. What is the main difference between FIFO and LIFO methods of pricing of material issues?
31. Explain (a) Simple average method (b) Weighted average method.
32. What is base stock method of pricing material issues?
33. Write a short note on Spoilage.

[Madras, I.M.Com. (2nd Sem.) Nov. 2004]

34. Write a short note on Wastage.

[Madras, I.M.Com. (2nd Sem.) Nov. 2004]

35. Explain the term Defective.

[Madras, I.M.Com. (2nd Sem.) Nov. 2004]

36. Explain any three types of scraps.

[Madras, B.Com., April 2007; I.M.Com.(ICE) (old) Oct. 2004]

37. What do you understand by
 (a) Obsolete materials (b) Dormant materials
38. What are 'Slow moving materials'?

(B) Long answer Questions :

1. What is material control? What are its objectives?

[Madras, B.Com. (ICE) Oct. 2002]

2. What are the objectives and essentials of material control?

[Madras, B.C.S. April 2002]

[Madras, B.Com(CS) April 2007]

3. Explain the essentials of material control.
4. What is material control? What are its advantages?
5. What is the role of different departments in organising material control?
6. Explain the objectives of establishing a separate purchasing department.
7. What is centralised purchasing? What are its advantages and disadvantages?

[Madras, B.C.S.(NYE) Nov. 2007; BCA/B.Sc. (ICE) Oct. 2000]

8. What are the qualifications required for a purchase manager? What are his duties?
9. Discuss the procedure to be followed by purchasing department while purchasing materials.

[Madras, B.C.S.(ICE) Oct. 1999]

10. What are the various steps to be followed in the purchase of raw materials in a large manufacturing concern?

[Madras, B.Com. April 2001; April 2000]

11. What do you understand by Inventory control? State its objectives.

[Madras, B.Com.(CS) April 2008; B.C.S. Oct. 1999]

12. What are the duties and responsibilities of a storekeeper?

[Madras, B.Com. (ICE) May 2003;

B.C.S.(ICE) Oct. 1999]

13. Discuss the functions of a Storekeeper.

[Madras, II M.Com.(old) Nov. 2004;

B.Com.(ICE) May 2003; B.C.S. Oct. 2000]

14. Discuss the pros and cons of centralised and decentralised stores.

15. Explain the importance and procedure of classification and codification of materials.

16. What is 'Bincard'? Distinguish between 'Bincard' and 'Stores ledger'.

[Madras, B.Com. April 2003]

17. What is Perpetual Inventory System? What are its merits?

[Madras, BCA/B.Sc. Nov. 2007; BCS(ICE) Oct. 2004; Oct. 2000; May 2000;

April 2000; B.Com., April 2002; B.Com.(ICE) May 2001]

18. Explain the merits and demerits of perpetual inventory system.

[Bharathiar, BBM Nov. 2007; Madras, BCA/B.Sc. April 2004;

B.Com. (ICE) Oct. 2001]

19. Briefly explain various inventory control techniques. [Madras, B.Com(CS) Ap. 2008]

20. Describe any three methods of inventory control.

[Madras, BBA(ICE) Oct. 2004]

21. What is EOQ? How is it computed?

[Madras, B.C.S.(ICE) Oct. 2001]

22. What do you mean by ABC analysis? What are its advantages?

[Madras, B.Com.(CS) April 2008; Nov. 2006; B.Com.(old) (ICE) Oct. 2004;

B.Com. Oct. 2001; B.C.S. Oct. 2002]

23. Explain "ABC" method of Inventory control.

[Bharathiar, BBM Nov. 2007; Madras, B.Com(CS) Nov. 2007; B.Com. April 1999]

24. Make a comparative analysis of various categories of ABC analysis.

[Madras, B.Com.(ICE) May 2003]

25. Explain 'Demand and Supply' method of stock control, involving stock levels and EOQ.

26. Explain (a) Maximum level (b) Minimum level (c) Reorder level (d) EOQ.

[Madras, B.Com., April 2007; B.C.S. April 2000]

27. What is Just-in-Time Inventory (JIT)? What are the advantages of JIT purchasing?

28. What is 'Min-max method' of Inventory control? How does it differ from Demand & Supply method?

29. What is Inventory Turnover Ratio? Explain its significance.

30. What are Material (Inventory) Cost Reports? Explain some of the important reports.

31. Discuss the important systems of pricing of material issues.

[Madras, B.Com(CS) April 2008; B.Com. Oct. 2002; Oct. 2000;

B.C.A./B.Sc. (ICE) Oct. 2001; B.C.A./B.Sc. April 2001]

32. Explain any Five methods of pricing material issues.

[Madras, B.C.S.(ICE) May 2001;

B.Com.(old) Oct. 1999]

33. What are the methods of pricing material issues? When do you advocate pricing the issues at cost price, based on "Last in First out"? [Madras, B.C.A./B.Sc. (ICSE) May 2001]

34. Distinguish between (a) Cost based pricing methods and (b) average price methods of pricing material issues.

35. Explain standard price method of pricing of material issues. How do you ascertain material price variance?

36. Discuss the terms Waste, Scrap and Spoilage and how they are treated in cost accounts.

[Madras, B.C.S. April 2001; B.Com. (old) 2000;

B.Com. (ICE) Oct. 2000; II M.Com. (ICE) May 2003]

37. Explain the accounting treatment of wastage and defectives.

[Madras, IIInd M.Com. April 2000]

38. How do you treat defectives, scrap and spoilage in cost accounts?

[Madras, IIInd M.Com. Oct. 2001]

39. Explain the distinction between waste and scrap. Discuss their treatment in cost accounts.

[Madras, IIInd M.Com. (ICE) May 2001]

40. What do you mean by Normal and Abnormal waste of material? How will you treat them in cost accounts?

[Madras, IIInd M.Com. April 2001]

41. What are obsolete, slow moving and dormant materials? How do you deal with them?

Objective Type Questions

I. Multiple Choice :

Choose the correct answer to the following :

1. Material control involves
 - (a) Consumption of material
 - (b) Issue of material
 - (c) Purchase of materials
 - (d) Purchase, storage and issue of materials.
2. Material requisition is meant for
 - (a) Purchase of material
 - (b) Supply of material from stores
 - (c) Sale of material
 - (d) None of the above.
3. Stock control through stock levels and EOQ is called
 - (a) Demand and supply method
 - (b) Perpetual inventory system
 - (c) Control by Importance and exception
 - (d) None of these.
4. ABC analysis is
 - (a) Always better control
 - (b) Advantage of better control
 - (c) At best control
 - (d) None of the above.

5. JIT inventory system is

- (a) Job in Time
- (b) Just Inventory Time
- (c) Just in Time
- (d) None of the above.

6. Perpetual inventory system involves

- (a) Bincard and stores ledger
- (b) Bill of materials and material requisition
- (c) Purchase requisition and purchase order
- (d) Inward and outward invoices.

7. FIFO is

- (a) Fast Investment in Future orders
- (b) First in First out
- (c) Fast issue of First orders
- (d) None of these.

8. LIFO method of pricing of material issues is more suitable when

- (a) Material prices are rising
- (b) Material prices are falling
- (c) Material prices are fluctuating
- (d) Material prices are unchanging.

9. Average price methods are more suitable when

- (a) Material prices are rising
- (b) Material prices are falling
- (c) Material prices are fluctuating
- (d) Material prices are constant.

10. Scrap is

- (a) Residue of Raw material
- (b) Wastage of material
- (c) Surplus material
- (d) Abnormal loss of material.

[Ans : 1.(d); 2.(b); 3.(a); 4.(a); 5.(c); 6.(a); 7.(b);

8.(a); 9.(c); 10.(a)]

II. Fill in the Blanks :

Fill the blanks in the following with suitable words.

1. Material control involves purchase, storage and _____ of materials.
2. Material is issued by storekeeper against _____ requisitions.
3. Perpetual inventory system is based on bincard, stores ledger and physical _____ of stock.
4. EOQ is economic _____ quantity.
5. _____ note is prepared after receiving and inspecting materials.
6. ABC analysis is always _____ control analysis.
7. VED analysis is Vital, _____ and Desirable analysis.
8. LIFO is _____ in First out method.
9. Weighted average is computed by dividing total purchase cost of material in stock with total _____ in stock.
10. Defectives can be sold as _____ after rectification.

[Ans : 1. Issue; 2. Material; 3. Verification; 4. Ordering;

5. Goods received; 6. Better; 7. Essential;

8. Last; 9. Quantity; 10. Seconds]

III. True or False :*Indicate whether the following statements are True or False :*

1. Purchasing department places purchase orders on the basis of purchase requisitions.
2. Stock levels are fixed as a part of demand and supply method of Inventory control.
3. ABC analysis gives equal importance to all materials.
4. Inventory Turnover Ratio is an indication of the efficiency of Inventory control.
5. First in First out method is suitable when material prices are violently fluctuating.
6. Weighted average method reduces the effect of fluctuations in prices.
7. Standard price method does not result in any material price variance.
8. Waste is a part of material lost in the process of production.
9. Scrap has no disposable value.
10. Spoilage can be normal or abnormal.

[Ans : 1. True; 2. True; 3. False; 4. True; 5. False;
6. True; 7. False; 8. True; 9. False; 10. True]

Exercises**(A) Short Answer Problems :**

1. Calculate Inventory Turnover Ratio from the following :

Opening Stock Rs. 80,000; Closing Stock Rs. 60,000; Material purchased Rs. 2,60,000.

[Ans : 4 Times]

2. From the following data calculate the Inventory turn over ratio.

Stock at 1st January Rs. 18,000

Stock at 31st December Rs. 10,000

Purchases during the year Rs. 76,000

[Madras, B.Com (gen & AF) April 2009]

[Ans: I.T.O.R.: 6 times]

3. The following are the quotations obtained from two suppliers, A and B :

A – Rs. 4 per unit;

B – Rs. 3.80 per unit, with fixed charge of Rs. 1,000 per order.

If the order quantity is

(a) 4,000 units or

(b) 5,000 units or

(c) 6,000 units

Which of the suppliers will you choose?

[Madras, B.Com. Oct. 1999]

[Ans : (a) Supplier A; (b) Either A or B; (c) Supplier B]

4. Ascertain Inventory carrying cost per unit : cost of raw material per unit : Rs. 50.

Average Rate of Return on Investment : 10%

Ordering Cost : Rs. 100 per order.

[Ans : Rs.5]

5. Find out Inventory carrying cost per unit :

Cost of Raw material per unit : Rs. 70

Inventory carrying cost 5%

Rent, Taxes Insurance etc. : Rs. 2.5 per unit.

[Ans : Rs. 6.]

6. From the following particulars, calculate the EOQ.

Annual requirements 10,800 kgs.

Cost of purchasing and receiving one order Rs. 1,000

Annual carrying cost Rs. 20.

[Madras, B.Com(ICE) Oct. 2008]

[Ans: EOQ: 1039kgs]

7. Calculate the re-order quantity from the following particulars:

Annual usage	20,000 units
--------------	--------------

Buying cost per order	Rs. 10
-----------------------	--------

Cost per unit	Rs. 100
---------------	---------

Cost of carrying inventory	10% of cost
----------------------------	-------------

[Madras, B.Com(PZSA) April 2006]

[Ans: 200 units]

8. A factory requires 2,000 units of a certain material for a year. Cost of carrying one unit of this material is Re. 1 per annum and it is estimated that the expenses of placing an order and receiving would be Rs. 10. Calculate Economic Order Quantity and number of orders per year.

[Madras, B.Com. (ICE) Oct. 2001]

[Ans : EOQ 200 units; Orders per year 10]

9. From the following figures, calculate Economic Order Quantity and number of orders to be placed in each year.

Annual consumption of materials = 4000 units

Cost of buying per order = Rs. 5

Cost per unit = Rs. 2

Storage and carrying cost = 8% on average inventory.

[Madras, B.Com. Oct. 2002]

10. Find out the Reorder level from the following :

Maximum consumption of Material 300 units; Minimum reorder period 2 weeks; Maximum reorder period 4 weeks.

[Ans: Thiruvalluvar BBA Nov./Dec. 2009]

[Ans : 1200 units]

11. Calculate the re-order level from the following information

Maximum consumption = 300 units per day

Minimum consumption = 200 units per day

Re-order period = 8 to 10 days

[Madras, B.Com(CS) (SYSE) April 2009]

[Ans: 3,000 units]

12. If the minimum stock level and average stock level of raw material A are 20,000 and 40,000 units respectively, find out its re-order quantity.

[Madras, B.Com(CS) (SYSE) April 2009]

[Ans: 40,000]

13. Compute the Minimum stock level :

Normal usage of material per month : 200 units
Normal reorder period : 2 months
Minimum reorder period : 1 month
Reorder level : 800 units.

[Ans: 400 units]

14. Calculate Maximum Stock level :

Reorder level : 4000 kgs; Reorder quantity : 2500 kgs; Minimum reorder period : 6 weeks; Minimum consumption per week : 300 kgs.

[Ans : 4700 kgs]

15. Find out the value of stock under FIFO :

Opening stock	: 400 units @ Rs. 10 per unit
Purchase	: 500 units @ Rs. 11 per unit
Issue	: 600 units

[Madras, B.Com(gen & AF) April 2010]

[Ans : Closing stock : 300 units
@ Rs. 11 = Rs. 3,300]

16. Find out the value of materials issued under FIFO.

Opening Stock	: 200 units @ Rs. 10 per unit
Purchase	: 400 units @ Rs. 15 per unit
Issue	: 300 units.

[Ans : Value of Material issued :
Rs. 3,500 ($200 \times 10 + 100 \times 15$)]

17. From the following details, prepare the stores ledger account by adopting FIFO method

December	1	Opening stock 1000 units at Rs. 2.00 each
	3	Purchased 800 units at Rs. 2.10 each
	5	Issued 1200 units
	12	Purchased 1600 units at Rs. 2.10 each

[Madras, B.Com, Nov. 2008; B.Com (ICE) May 2005]
[Ans: Closing Stock: 220 units at Rs. 2.10 = Rs. 4,620]

18. Compute closing stock under LIFO :

Purchase of Material on 1-2-2009	: 1000 units @ Rs. 12 per unit
Purchase of Material on 5-2-2009	: 1500 units @ Rs. 14 per unit
Issue of Material on 10-2-2009	: 2100 units.

[Ans : 400 units @ Rs. 12 per unit = Rs. 4,800]

19. Find out the value of Materials issued under LIFO :

Opening stock on 1-1-2010	: 200 units @ Rs. 16 per unit
Purchase on 8-2-2010	: 300 units @ Rs. 18 per unit
Issue on 15-2-2010	: 350 units

[Ans : Rs. 6,200 ($300 \times 18 + 50 \times 16$)]

20. Calculate the closing stock under simple average method from the following :

Stock of Material on 1-11-2009	: 600 units @ Rs. 19 per unit
Purchase of Material on 10-11-2009	: 500 units @ Rs. 20 per unit
Issue of Material on 15-11-2009	: 500 units

[Ans : 600 units; Value Rs. 11,650]

21. Calculate closing Stock of Material under Weighted Average Method:

Opening Stock on 1-1-2010	: 100 Tons at Rs. 100 per ton
Purchase on 10-1-2010	: 400 Tons at Rs. 110 per ton
Issue on 15-1-2010	: 200

[Ans : 300 Tons @ Rs. 108 per Ton = Rs. 32,400]

(B) Other Exercises

I. PURCHASE PRICE COMPUTATION

(a) Computation of Material cost

1. The following quotation is received from a supplier in respect of Material X :

Lot price : 10,000 units at Rs. 25 per unit.

20,000 units at Rs. 20 per unit.

Trade discount 25%. Cash discount at 5% (if payment is made within a week). Freight charges Rs. 1,000 per order. Containers, one for every 1,000 units, are charged at Rs. 250 each. If they are returned within 2 months, credit will be given at Rs. 230 each.

Calculate the material cost for 20,000 units, assuming the containers will be returned.

[Ans : Total Material cost : Rs. 3,01,400;

Cost per unit : Rs. 15.07]

Hint: Ignore cash discount

2. A quotation is received from a supplier in respect of material 'D' as follows :

Lot price - 10,000 Kg. at Rs. 50 per Kg.

50,000 Kg. at Rs. 45 per Kg.

1,00,000 Kg. at Rs. 40 per Kg.

Trade discount is at 25% and cash discount of 10%, if payment is made within 15 days. One container is required for every 10,000 Kg. of the Material and containers cost Rs. 10,000 each but Rs. 9,000 will be credited if returned within 3 months.

Calculate the material cost for 50,000 Kg. of Material, assuming containers are returned in due course.

[Ans : Material cost : Rs. 16,92,500]

Hint: Ignore cash discount, since it is a matter of financial policy.

3. (Selection of supplier)

The following quotations were received from two suppliers for a material after inviting tenders :

Supplier I – Rs. 1.80 per unit.

Supplier II – Rs. 1.60 per unit plus Rs. 5,000 fixed charges per order.

1. Calculate the order quantity for which the purchase price will be the same per unit.
2. Which supplier should be chosen for the following order quantities?

(a) 20,000 units (b) 30,000 units.

[Ans : (1) Order quantity 25,000 units; Order cost per unit is Rs. 1.80 from both suppliers;

(2) (a) For 20,000 units – Supplier I is cheaper

Cost : Supplier I Rs. 36,000, Supplier II Rs. 37,000;

(b) For 30,000 units – Supplier II is cheaper;

Cost : Supplier I Rs. 54,000; Supplier II Rs. 53,000]

4. A supplier quotes for material 'A' as follows :

Lot price 100 units Rs. 10 each.

Lot price 500 units Rs. 9 each.

Lot price 1,000 units Rs. 8 each.

Trade discount 20%. Cash discount 2.5% for payment in seven days. Containers charged at Rs. 20 each; Rs. 14 credited on return; one container required for every 100 units. The purchaser decides to buy 600 units. Transport charges amounting to Rs. 20 and storage Rs. 4 were charged by the supplier.

Calculate purchase price of Material 'A'.

[Madras, B.Com., March 1995]

[Ans : Purchase price per unit : Rs. 7.30;

Purchase value of 600 units : Rs. 4,380]

5. The following quotation is received from a supplier in respect of material X :

Lot price –	1000 Kgs.	Rate per Kg.	
	5000 Kgs.	5.00	
	10000 Kgs.	4.50	
		4.00	

Trade discount 20% and cash discount 5% if payment is made within 15 days. One container is required for every 1000 Kgs. of the material and containers are charged at Rs. 100 each but credited Rs. 90 if returned within 3 months.

Transport charges for any order	Rs.
Storage charges	500

Calculate the material cost for 5000 Kgs. and per Kg. of the material when the purchaser decides to purchase 5000 Kgs. of the material, assuming containers are returned in due course.

[Madras, B.Com. (old) Oct. 2000;

B.Com. 1985 April, M.Com., Sept. 1985]

[Ans : Material cost for 5,000 Kgs. Rs. 18,700;
Cost per Kg. of the Material Rs. 3.74]

Note : Cash discount is ignored.

6. (Material Losses)

One parcel containing two vital components was received by a factory and the invoice relating to the same discloses the following :

I Material 500 Kgs. at Rs. 2 per Kg.	Rs. P.
II Material 600 Kgs. at Rs. 1.60 per Kg.	1,000.00
Insurance	960.00
Sales Tax	39.20
Freight, etc.	98.00
	55.00

Transit loss of 10 units of Material I and 6 units of Material II was noted. However, no insurance claim could be made.

Find the issue rate per unit of each material. If a provision for obsolescence of 10% is to be made, find the revised issue rates.

[Madras, B.Com. April 1999]

[Ans : Issue rate per unit of Material : I Rs. 2.483; II Rs. 1.9776

Total cost : M.I. Rs. 1,095; M.II. Rs. 1057.20

Net Weight M1–441 units; M11 – 534.6 units]

7. (Details of expenses and Material Loss)

From the following details, ascertain the effective cost of Material per Kg.

Material purchased as per invoice :	Rs.
Chemical 'R' – 400 units at Rs. 10 each	4,000
Chemical 'S' – 400 units at Rs. 50 each	20,000
Freight at Rs. 2 per unit	1,600
Sales Tax at 10%	2,400
	<hr/> 28,000

Handling charges of Rs. 50 and Rs. 300 respectively are to be included for chemicals 'R' and 'S'. Shortages of 5%, considered as Normal, are expected in transport and a further loss of 30 units each may be expected before the materials can be completely used.

[Ans : Effective cost per Kg.: 'R' Rs. 15; 'S' Rs. 66;

Total cost : 'R' Rs. 5,250; 'S' Rs. 23,100]

(B) Purchase cost of Material in Mixed lots

8. A lorry load of Material of mixed goods were purchased for Rs. 90,000. These were sorted into the following grades whose market rate is shown against each.

Grade A – 5,000 units selling rate @ Rs. 12

Grade B – 3,000 units selling rate @ Rs. 10

Grade C – 2,000 units selling rate @ Rs. 5

Find the purchase rate per unit on each grade of the Material assuming that all grades yield same rate of profit.

[Madras, B.Com(CS) (SYSE) April 2010; BCA/B.Sc.(ICE) Oct. 2009]

[Madurai, B.Com.]

[Ans : Purchase rate per unit – Grade A : Rs. 10.80;

Grade B : Rs. 9.00;

Grade C : Rs. 4.50]

9. A company purchased a wagon load of Kashmir Apples for Rs. 40,000 and they were sorted into four different grades keeping the market in mind. The sale prices of the grades with relevant quantities were as follows :

Grade I – 1000 Dozens at Rs. 20 per Dozen.

Grade II – 3000 Dozens at Rs. 15 per Dozen.

Grade III – 2000 Dozens at Rs. 12 per Dozen.

Grade IV – 1000 Dozens at Rs. 11 per Dozen.

Ascertain the purchase rate per Dozen of each grade of Apples, assuming the profit on sale is uniform on all grades.

[Ans : Purchase rate per Dozen – Grade I : Rs. 8;

Grade II : Rs. 6;

Grade III : Rs. 4.80;

Grade IV : Rs. 4.40]

(C) Inventory Turnover Ratio

10. From the following figures calculate the inventory turnover ratio.

	Rs.
Stock as on 1st Jan. 2010	25,000
Stock as on 31st Dec. 2010	35,000
Purchases during 2010	2,50,000

[Ans : Inventory Turnover Ratio – 8 times]

11. The following information is available from the books of a company for the year ended 31st December 2009.

	Rs.
Opening stock of Material A	14,000
Purchases of Material A	2,30,000
Closing stock of Material A	10,000

Calculate the Material turnover ratio of Material A and also ascertain such turnover in terms of days.

[Kerala, M.Com., Adapted]

[Ans : Material turnover Ratio = 19.5 times;
Material turnover in days 18.72 or 19 days]

12. Calculate the Material turnover Ratio for the year 2009 from the following details.

	Material A Rs.	Material B Rs.
Opening Stock	25,000	87,500
Closing Stock	15,000	62,500
Purchases	1,90,000	1,25,000

Determine the fast moving Material.

[Madras, B.Com(CS) (SY5A) Nov. 2009; $\frac{2}{5}$ Figs.]

[BCS(SY5A) Nov. 2006; B.Com. Oct. 2003]

[Ans : Material turnover Ratio : Material 'A' – 10 times;
Material 'B' – 2 Times; Material 'A' is the fast moving Material due to its higher Material turnover]

II EOQ—Economic Ordering Quantity**(A) Simple EOQ Problems**

13. Calculate economic ordering quantity from the following particulars :

Annual requirement = 1,600 units

Cost of Material per unit = Rs. 40

Cost of placing and receiving one order Rs. 50.

Annual carrying cost of inventory. 10% of inventory value.

[Thiruvalluvar, B.Com., Ap./May 2010]

[Madras, B.Com.,(ICE) May 2005; B.C.A./B.Sc. April 2003;

B.C.S. April 2002; B.Com. April 2000]

[Ans : EOQ = 200 units]

14. Calculate the economic ordering quantity from the following information.

Consumption of Material per annum ... 10,000 Kg.

Ordering cost per order ... Rs. 50.

Cost per Kg. of raw Material ... Rs. 2

Store cost ... 8% on Inventory.

[Periyar, B.Com., B.Com(CA) Ap./May 2006]

[Madras, B.Com., Ap. 2007; B.Com(CS) Nov. 2006;

BCS(ICE) Oct. 2004]

[Ans : EOQ 2500 Kgs.]

15. A company uses 10,000 units per year of an item costing Rs. 5 each. The cost of processing a purchase order is Rs. 100 and the stock holding cost amounts to 20% per year of the money value of inventory. How much should the company buy at a time (in a single order) in order to minimise the inventory cost?

[Madras, B.Com(gen & AF) April 2008]

[Ans: EOQ: 1414 units]

16. Calculate economic order quantity :

Annual consumption	600 units
Order cost	Rs. 12 per order
Cost price per unit	Rs. 20
Storage & carrying cost	20%

[Madurai, B.Com (gen&AF) Nov. 2009; B.Com., Nov. 2008;
Thiruvalluvar, BBA., Nov/Dec. 2009]

[Periyar, B.Com., B.Com (CA) Oct/Nov. 2005]

[Madras, B.Com. (ICE) Oct. 2005; B.C.A./B.Sc. (ICE) May 2003]

[Ans : EOQ 60 units]

17. Calculate the economic order quantity from the following particulars.

Annual usage	20,000 units
Buying cost per order	Rs. 10
Cost per unit	Rs. 100

Cost of carrying inventory 10% of cost.

[Madras, B.Com., Nov. 2006; BCS (Non Sem-PYE) Nov. 2005,
B.Com. (Old) March 1997; B.A. corp., March 1996]

[Ans : EOQ 200 units]

18. From the following information, determine the EOQ.

Annual consumption	=	90,000 units
Cost per unit	=	Rs. 50
Buying cost per order	=	Rs. 10
Cost of carrying inventory	=	10% of cost.

[Madras, B.Com (PZSA) Nov. 2006; B.Com. April 2004;
B.Com. (ICE) (old), Oct. 1998; B.A. Corp. May 1996]

[Ans : EOQ = 600 units]

19. Calculate the economic order quantity from the following particulars.

Annual usage : 6,000 units. Cost of Materials per unit Rs. 20; Cost of placing and receiving one order Rs. 60; Annual carrying cost : Rs. 2 per unit.

[Madras, B.C.S. (ICE) May 2004;
B.Com., April 1998; March 1995 (old)]

[Ans : EOQ = 600 units]

Hint : Carrying cost of Rs. 2 per unit can be directly used in the formula, without any reference to cost per unit.

(B) EOQ – Where Material usage is given in Rupees

20. Find out the economic ordering quantity (EOQ) from the following particulars :

Annual usage	:	Rs. 1,20,000
Cost of placing and receiving one order	:	Rs. 60.

Annual carrying cost : 10% of inventory value.

[Madras, BCA/B.Sc. (ICE) Oct. 2009; B.Com (CS) (SYSE) April 2009;
B.Com., April 2005; (modified) BCS (ICE) April 2005]

[Ans : Economic ordering quantity = Rs. 12,000; Refer Illustration No. 10]

21. You are required to compute the economic ordering quantity with the help of the details given below :

Material usage per month	Rs. 1,600
Buying cost per order	Rs. 40.
Storage and carrying cost	15% of Inventory value.

[Ans : Economic ordering quantity Rs. 3,200;
Refer Illustration No. 10]

(C) EOQ and ordering schedule

22. Calculate economic order quantity. Also state the number of orders to be placed in a year.

Consumption of material per annum 10,000 Kg.
Cost of Material per kilogram Rs. 2.
Order placing costs per order Rs. 50.
Storage costs 8% on Average Inventory.

[Madras, B.Com (Gen) Ap 2008; B.Com. (ICE), May 1999;
Sept. 1992, Sept. 1991]

[Ans : EOQ = 2,500 Kgs. No. of orders to be placed p.a. = 4 orders]

23. Find the economic order quantity when the annual consumption is 6,000 kilos. Ordering cost is Rs. 120 per order. Price per kilo is Rs. 20 and carrying cost is 20%. Also ascertain the frequency of placing orders.

[Bharathidasan, B.Com.]

[Ans : EOQ = 600 Kilos; No. of orders = 10 per annum
Frequency-one order per 36.5 or 37 days (or)
one order per 1.2 months]

24. The following data pertain to a component part No. 0628:

Purchase price per unit R.s 60

Purchase order cost Rs. 240.

Total requirement for a 45 week year – 9,000 units

Carrying cost – 20% of average Inventory value.

What is the economic order quantity? What is the Frequency of placing the orders?

[Madras, B.A. Corp. Sept. 1985]

[Ans : EOQ = 600 units; No. of orders = 15

Frequency (Based on 45 week year) = One order for every 3 weeks]

(D) EOQ – With Details of costs :

25. A manufacturer buys certain equipment from outside suppliers at Rs. 30 per unit. Total annual needs are 80,000 units. The following further data are available.

Annual return on investment – 10%

Rent, insurance, taxes per unit per year Re. 13.

Cost of placing an order Rs. 100.

Determine the economic order quantity.

/Bharathidasan, B.A., April 1992]

- [Ans : EOQ = 1,000 units]
- $$\left[\sqrt{\frac{2 \times 80,000 \times 100}{(30 \times \frac{10}{100}) + 13}} \right]$$

26. A car making company buys 2,000 steel parts @ Rs. 140 per part for assembly. The buying cost per order is Rs. 35.

The inventory carrying cost is Rs. 14 per unit per year, calculated as :
Return on investment is 8% = Rs. 11.20

Rent, taxes, Insurance, handling charges etc. Rs. 2.80. Calculate the EOQ.

$$[\text{Ans : EOQ} = 100 \text{ units } \left(\sqrt{\frac{2 \times 2,000 \times 35}{11.20 + 2.80}} \right)]$$

27. An engineering company consumes 50,000 units of a component per year. The ordering, receiving and handling costs are Rs. 3 per order while the trucking costs are Rs. 12 per order. Further details are as under.

Interest Rs. 0.06 per unit per year. Deterioration cost Re. 0.004 per unit per annum. Storage cost Rs. 1,000 per annum for 5,000 units.

Calculate the EOQ.

/Madras, B.A. Corp. Sept. 1996]

$$[\text{Ans : EOQ} = 2,384 \text{ (approx) } \left(\sqrt{\frac{2 \times 50,000 \times (2+13)}{.06+.004+.20}} \right)]$$

(E) EOQ and Inventory cost

28. A publishing house purchases 4,000 units of a particular item per year at a unit cost of Rs. 20. The order cost per order is Rs. 50 and the inventory carrying cost is 25%. Find the optimal order quantity and the minimum total cost including the purchase cost.

/Madras, B.A. Corp., Sept. 1997]

[Ans : Optimal order quantity = 283 units;

Minimum total cost = Rs. 81,407.5 (80,000 + 700 + 707.5)]

Hint : See Illustration No. 12 Page 3.57.

29. The following details are available in respect of a firm.
Inventory requirement per year 6,000 units.

Cost per unit (Other than carrying and ordering costs) Rs. 5

Carrying costs per item for one year Re. 1.

Cost of placing each order Rs. 60

Alternative order sizes: (Units) 6,000, 3,000, 2,000, 1,200, 1,000, 600. Determine the economic order quantity.

/Madras, BCS(PYE) Nov. 2006]

- [Ans: EOQ: 849 units; Nearest order size is 1000 units]
30. A company buys its annual requirement of 36,000 units in 6 instalments. Each unit costs Re. 1 and the ordering cost in Rs. 25. The inventory carrying cost is estimated at 20% of unit value. Find the total annual cost of the existing policy. How much money can be saved by Economic Order Quantity?

/Madras, B.Com(CS) (SYSE) Nov. 2008]

[Ans: EOQ: 3,000 units; Saving: Rs. 150 (750 - 600)]

III. COMPUTATION OF STOCK LEVELS

(A) Stock levels for one material :

31. From the following information, calculate :

- Maximum stock level
- Minimum stock level
- Reorder level
- Average stock level.

Minimum consumption – 240 units per day

Maximum consumption – 420 units per day

Normal consumption – 300 units per day

Reorder quantity – 3,600 units

Reorder period – 10 – 15 days.

Normal reorder period – 12 days.

/Thiruvalluvar BBA., Nov. 2009]

/Madras, BCA/B.Sc. (ICE) Oct. 2008; B.Com(PZ5A) Nov. 2007;
B.Com. April 2005; B.C.S. April 2005; Oct. 2003;
B.C.A./B.Sc. April 2003]

[Ans : (a) 7,500 units (b) 2,700 units (c) 6,300 units
(d) 5,100 units (or) 4,500 units]

32. From the following information calculate Maximum, Minimum and Average stock levels.

Normal consumption per day	500 Kgs.
Minimum consumption per day	200 Kgs.
Maximum consumption per day	800 Kgs.
Lead time	10 to 16 days
Reorder quantity	3,000 Kgs.

/Madras, B.Com., April 2003; B.A. Corp., Oct. 1998]

[Ans : Maximum stock level = 13,800 units;

Minimum stock level = 6,300 units;

Average stock level = 10,050 units or 7,800 units]

33. From the following data for the last twelve months compute reorder level, minimum level and average stock level of a stock item.

Maximum usage in a month 300 Kgs.
Minimum usage in a month 200 Kgs.
Average usage in a month 225 Kgs.

Time-lag in the procurement of materials : Maximum – 6 months; Minimum – 2 months;
Reordering quantity – 750 Kgs.

[Madras, B.Com., Nov. 2006; B.Com.(Sem) (PZSA) Nov. 2005;
B.Com., April 2003; B.A. Corp. Oct. 1998]

[Ans : Reorder level = 1,800 units;
Minimum level = 900 units;

Average stock level = 1,275 units (900 + 375)]

34. Calculate minimum stock level, Maximum stock level and Re-ordering level from the following details :

(i) Minimum consumption – 100 units per day
(ii) Maximum consumption – 150 units per day
(iii) Normal consumption – 120 units per day
(iv) Re-order period – 10-15 days
(v) Reorder quantity – 1,500 units
(vi) Normal reorder period – 12 days

[Thiruvalluvar, B.Com., Nov./Dec. 2009]
[Bharathiar, B.Com., Nov. 2007]

[Madras, B.Com(ICE) Oct. 2009; B.Com., Nov. 2006; BCS (Sem-SYSA)
Nov. 2005; B.C.A./B.Sc. Oct. 2003; B.Sc.(ICE) Oct. 2000]

[Ans : Minimum Stock level = 810 units;
Maximum Stock level = 2,750 units;
Reordering level = 2,250 units]

35. Calculate Reorder level, Minimum stock level, Maximum stock level and Average stock level from the following information:

Normal usage – 300 units per week
Maximum usage – 450 units per week
Minimum usage – 150 units per week
Reorder period – 4 to 6 weeks
Reorder quantity – 2,400 units

[Madras, B.C.A. Nov. 2006; B.Com. March 1997]

[Ans : Reorder level = 2,700 units;
Minimum stock level = 1,200 units;

Maximum stock level = 4,500 units;

Average stock level = 2,850 units (or) 2,400 units]

36. From the following data for the last 12 months, compute the average stock level for a component.

Maximum usage in a month – 300 Units
Minimum usage in a month – 200 Units
Average usage in a month – 225 Units

Time lag in procurement of materials :

Maximum 6 months
Minimum 2 months
Reorder quantity – 760 Units

[Madras, B.Com., Nov. 2006; B.Com., Sept. 1991]

[Ans : Average stock level = 1,530 units $\left(\frac{2160 + 900}{2}\right)$

or = 1,280 units $\left(900 + 760 \times \frac{1}{2}\right)$]

(B) Stocks levels for two or more Materials :

37. Two components X and Y are used as follows :

Normal usage – 600 units per week each
Maximum usage – 900 units per week each
Minimum usage – 300 units per week each

Reorder quantity :

X 4,800 units
Y 7,200 units

Reorder period :

X 4 to 6 weeks
Y 2 to 4 weeks.

Calculate for each component :

(a) Reorder level (b) Minimum level (c) Maximum level (d) Average stock level.

[Bharathiar, B.Com (Economics) Nov. 2007]

[Madras, B.Com(gen & AF) April 2010 $\frac{1}{2}$ Figs; B.Com., BBA ect Nov. 2008]

BCA/B.Sc(ICE) Oct. 2007; B.Com (PZSA) Nov. 2006/

[Ans : (a) X – 5,400 units (b) X – 2,400 units

Y – 3,600 units Y – 1,800 unit

(c) X – 9000 units

Y – 10200 units

(b) X – 5,700 units (or) 4,800 units;

Y – 6,000 units (or) 5,400 units]

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38. Two Materials A and B are used as follows :

Normal consumption	50 units per week each
Minimum consumption	25 units per week each
Maximum consumption	75 units per week each
Re-order quantity	A 300 units B 500 units
Reorder period	A 4 to 6 weeks B 2 to 4 weeks

Calculate (a) Re-order level (b) Minimum level (c) Maximum level (d) Average stock level.

[Periyar B.Com., B.Com(CA) May 2006; May 2005]

[Madras, B.Com., B.Com(AF) Nov. 2009 Modified; B.Com(PZSA) Apr 2007;

BCA/B.Sc.(ICE) May 2005; B.C.A./B.Sc., April 2004;

Oct. 2001; B.Com., April 2001; B.Com., April 2000;

[Ans: (a) A - 450 units; (b) A - 200 units; (c) A - 650 units;

B - 300 units; B - 150 units; B - 750 units;

(d) A - 425 (or) 350 units;

B - 450 (or) 400 units]

39. Two components A and B are used as follows :

Normal usage	3,000 units per week each
Minimum usage	1,500 units per week each
Maximum usage	4,500 units per week each
Reorder quantity	

A - 13,000 units B 14,000 units

Reorder period :

A - 4 to 6 weeks B 2 to 4 weeks

Calculate for each component :

- (a) Reorder level (b) Minimum level
- (c) Maximum level (d) Average stock level

[Madras, B.Com.(Sem. PZSA) April 2006; B.C.S.(ICE)

May 2003; B.A. Corp., March 1994]

[Ans : (a) A - 27,000 units; B - 18,000 units; (b) A - 12,000 units;

B - 9,000 units; (c) A - 34,000 units;

B - 29,000 units; (d) A - 23,000 or 18,500 units;

B - 19,000 or 16,000 units]

(C) Stock levels and EOQ

40. In a company, 50 units are required every day for a machine. A fixed cost of Rs. 50 per order is incurred for placing an order. The inventory carrying cost per item amounts to Re. 0.02 per day. The lead period is 32 days. Compute.

- (a) Economic order quantity
- (b) Re-order level

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Materials

[Madras, B.Com(CS) (SYSE) Nov. 2009]

[Ans: EOQ: 500 units; R.L: 1600 units]

41. The following particulars were collected from a manufacturing unit for the year 2008:

Monthly demand	1,000 units
Cost of placing an order	Rs. 100
Annual carrying cost per unit	Rs. 15
Normal usage	50 units per week
Minimum usage	25 units per week
Maximum usage	75 units per week
Reorder period	4 to 6 weeks

Calculate from the above particulars :

- (a) Reorder quantity (b) Re-order level and (c) Minimum level.

[Madras, B.Com(CS) (SYSA) April 2009;

B.C.S. April 2003; B.Com.(ICE) Oct. 2002]

[Ans : (a) 400 units (b) 450 units (c) 200 units]

42. The following information pertaining to a firm is available :

Annual consumption	12,000 units (360 days)
Cost per unit	Rs. 1
Cost per order	Rs. 12
Inventory carrying cost	20% p.a.

Lead time (Maximum, Normal and Minimum) 30-15-5 (days)

Daily consumption (Maximum, Normal and Minimum) 45-33-15 (units)

Calculate Inventory levels.

[Madras, B.Com. April 1999]

[Ans : Reorder level = 1,350 units; EOQ = 1,200 units;
Maximum level = 2,475 units; Minimum level = 855 units]

43. Calculate (a) EOQ (b) Maximum level (c) Minimum level and (d) Reordering level from the following data :

Reorder period	4 to 6 weeks
Maximum consumption	100 units per week
Minimum consumption	50 units per week
Normal consumption	75 units per week
Annual consumption	36,000 units
Cost per unit	Rs. 1
Ordering cost	Rs. 25

Inventory carrying cost is 20% of unit value.

[Ans : (a) 3,000 units; (b) 3,400 units;
(c) 225 units; (d) 600 units]

3.110

(D) Ordering quantity from given levels :

44. The following information is available in respect of component D. 20:

Maximum stock level	: 8,400 units
Budgeted consumption	: 1,500 units per month
Maximum	800 units per month
Minimum	
Estimated delivery period	
Maximum	4 months
Minimum	2 months

You are required to calculate

- (a) Reorder level
- (b) Reorder quantity.

[Madras, B.A. Corp., Sept. 1989]

[Ans : (a) 6000 units; (b) 4000 units]

45. From the following data available find out :

(1) re-order level	
(2) re-order quantity	
Maximum stock level	16,800 units
Budgeted consumption	
Maximum	3,000 units per month
Minimum	1,600 units per month
Estimated delivery period	
Maximum	4 months
Minimum	2 months

[Ans : (1) 12,000 units; (2) 8,000 units]

IV PRICING OF MATERIAL ISSUES

(A) FIFO (First in First Out Method)

46. From the following particulars prepare the stores ledger by adopting First in First Out method.

2003-March 1	Purchased 300 units at	Rs. 2 per unit
2	Purchased 600 units at	Rs. 3 per unit
5	Issued 400 units	
8	Issued 200 units	
10	Purchased 600 units at	Rs. 5 per unit
12	Issued 400 units	

[Madras, B.Com(gen & AF) Nov. 2009]

[Ans : Closing Stock : 500 units at Rs. 5 per unit Rs. 2,500]

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Materials

47. The stock in hand of a material as on 1-9-1986 was 500 units at Re. 1 per unit. The following purchases and issues were subsequently made. Prepare the stores ledger account showing how the value of the issues would be recorded under FIFO.

Purchases	Issues
6-9-1986 100 units at Rs. 1.10	9-9-86 - 500 units
20-9-1986 700 units at Rs. 1.20	22-9-86 - 500 units
27-9-1986 400 units at Rs. 1.30	30-9-86 - 500 units
13-10-1986 1,000 units at Rs. 1.40	15-10-86 - 500 units.

[Madras, B.A. Corp., Sept. 1990]

[Ans : Closing Stock : 700 units at Rs. 1.40 = Rs. 980]

48. The following information is extracted from the stores ledger :

Sep.	1	Opening balance	500 units at Rs. 10
	6	Purchases	100 units at Rs. 11
	20	Purchases	700 units at Rs. 12
	27	Purchases	400 units at Rs. 13
Oct.	13	Purchases	1,000 units at Rs. 14
	20	Purchases	500 units at Rs. 15
Nov.	17	Purchases	400 units at Rs. 16

Issues of Materials :

Sep. 9	-	500 units
22	-	500 units
30	-	500 units
Oct. 15	-	500 units
22	-	500 units
Nov. 11	-	500 units

Issues are to be priced on the principle of 'FIFO'. Write the stores ledger account.

[Madras, B.Com(Gen) April 2008; B.Com.(ICE), May 1999]

[Ans : Closing Stock 600 units at Rs. 9,400 (200 × 15+400 × 16)]

49. The following information is extracted from the stores ledger.

Jan. 1	Opening Balance	500 units at Rs. 4
5	Purchases	200 units at Rs. 4.25
12	Purchases	150 units at Rs. 4.10
20	Purchases	300 units at Rs. 4.50
25	Purchases	400 units at Rs. 4.

Issues of Materials were as follows :

Jan. 4	200 units
10	400 units
15	100 units
19	100 units
26	200 units
30	250 units.

Issues are to be priced on the principle of 'FIFO' method. Write the stores ledger Account.

[Thiruvalluvar, B.Com., Ap./May 2010; Periyar, B.Com., May 2005]
 [Madras, B.Com.(CS) (SYSE) April 2010; Nov. 2009; B.Com.(CS)
 Nov. 2007; BCS (PYE) Nov. 2007; B.Com.(old) April 2002;
 [Ans : Closing stock : 300 units at Rs. 4 per unit = Rs. 1,200]

50. (Material returns)

From the following particulars prepare stores ledger account under 'FIFO' method of pricing issues.

1992

Jan. 1	Opening balance	50 units at Rs. 30 per unit
5	Issued	20 units
7	Purchased	48 units at Rs. 40 per unit
9	Issued	20 units
19	Purchased	36 units at Rs. 35 per unit
24	Received back	10 units out of the units issued on 9th January
27	Issued	15 units.

[Madras, B.A. Corp., Sept. 1995]

[Ans : Closing Stock 89 units,

Value Rs. 3,280 ($43 \times 40 + 36 \times 35 + 10 \times 30$)

Hint : Returned Material of 10 units are to be shown like a fresh receipt at the original issue price of Rs. 30.

51. (Material Returns)

Record the following transactions in the stores ledger pricing the materials under FIFO method.

May 1	Balance	500 units at Rs. 25 per unit
May 3	Received	300 units at Rs. 30 per unit
May 5	Issued	200 units
May 7	Issued	120 units
May 8	Received back	10 units [Issued on May 7]

[Bharathiar, B.Com.(CA) Nov. 2007]

[Madras, B.A. Corp., Apr. 1998]

[Ans : Closing stock : 490 units, value Rs. 13,750

($180 \times 25 + 300 \times 30 + 10 \times 25$)

Hint : Material received back is to be treated like a fresh receipt at the original issue price of Rs. 25.

Materials

52. (Returns)

Prepare a stores ledger account from the following information adopting FIFO method of pricing of issues of materials.

1998

March 1	Opening Balance	500 tonnes at Rs. 200
3	Issue	70 tonnes
4	Issue	100 tonnes
8	Issue	80 tonnes
13	Received from supplier	200 tonnes at Rs. 190.
14	Returned from department	'A' 15 tonnes
16	Issue	180 tonnes
20	Received from supplier	240 tonnes at Rs. 195
24	Issue	300 tonnes
25	Received from supplier	320 tonnes at Rs. 200
26	Issue	115 tonnes
27	Returned from department	'B' 35 tonnes
28	Received from supplier	100 tonnes at Rs. 200.

[Madras, B.Com., March 1998]

[Ans : Closing stock – 565 Tonnes, Valued at Rs. 1,12,275

($110 \times 195 + 320 \times 200 + 35 \times 195 + 100 \times 200$)

Hint : Returns from departments on March 14 and 27 are to be assumed out of the immediate preceding issue since no details are given.

53. (Losses and Returns)

The following transactions are recorded in respect of materials used in a factory during April 1984.

April 1	Opening balance	500 tonnes at Rs. 25
2	Issue	70 tonnes
4	Issue	100 tonnes
7	Issue	80 tonnes
12	Received from vendor	200 tonnes at Rs. 26
14	Refund of surplus from a work order	15 tonnes at Rs. 25
16	Issue 180 tonnes	
20	Received from vendor	240 tonnes at Rs. 25
24	Issue	300 tonnes
25	Received from vendor	320 tonnes at Rs. 28
26	Issue	112 tonnes
27	Refund of surplus from a work order	12 tonnes at Rs. 27
28	Received from vendor	100 tonnes at Rs. 29

[Madras, B.Com., Sept. 1986]

[Ans : Closing Stock 532 units, valued at Rs. 14,684;
 $(100 \times 25 + 320 \times 28 + 12 \times 27 + 100 \times 29)$]

Hint : 1. Returns from work orders are to be treated like fresh receipts.

2. Shortage on stock verification is treated like an issue.

(B) LIFO (Last in First out Method)

54. X Ltd. has purchased and issued the materials in the following order.

Jan. 1995 1	Purchased	300 units at Rs. 5 per unit
4	Purchased	600 units at Rs. 4 per unit
6	Issued	500 units
10	Purchased	700 units at Rs. 5 per unit.

Ascertain the closing stock as on 31-1-95 under LIFO method.

[Madras, B.A. Corp., Sept. 1996]

[Ans : Closing Stock 1100 units valued at Rs. 5,400
 $(300 \times 5 + 100 \times 4 + 700 \times 5)$]

55. From the following particulars, prepare the stores ledger under Last in First out method.

Dec. 1	Stock in hand	500 units at Rs. 20
Dec. 2	Issued	200 units
Dec. 3	Purchased	150 units at Rs. 22
Dec. 4	Issued	100 units
Dec. 5	Purchased	200 units at Rs. 25.

[Madras, B.A. Corp., May 1998]

[Ans : Closing Stock : 550 units valued at
 Rs. 12,100 ($300 \times 20 + 50 \times 22 + 200 \times 25$)]

56. From the following particulars, prepare a stores ledger by adopting LIFO method.

Date	Receipts	Issues
1990 Jan. 1	300 units at Rs. 10 per unit	
10	200 units at Rs. 12 per unit	
15		250 units
18	200 units at Rs. 14 per unit	
20		300 units
25	100 units at Rs. 16 per unit	
31		100 units

[Madras, B.A. Corp., Sept. 1992]

[Ans : Closing Stock 150 units at Rs. 10 per unit = Rs. 1,500]

57. The following information is provided by Coorg Coffee manufacturing unit for the fortnight of April 1996.

Material - A

Stock on 1-4-96	100 units at Rs. 5 per unit
Purchases : 5-4-96	300 units at Rs. 6
8-4-96	500 units at Rs. 7
12-4-96	600 units at Rs. 8
Issues : 6-4-96	250 units
10-4-96	400 units
14-4-96	500 units

Calculate the value of material consumed during the period under LIFO method.

[Madras, B.A. Corp., March 1997]

[Ans : Closing stock : 350 units valued at Rs. 2,300
 $(100 \times 5 + 50 \times 6 + 100 \times 7 + 100 \times 8)$

Material consumed: Rs. 8,300

58. The "Received" side of the stores Ledger Account Shows the following particulars:

Jan. 1	Opening Balance	500 units @ Rs. 4.00
Jan. 5	Received from vendor	200 units @ Rs. 4.25
Jan. 12	Received from vendor	150 units @ Rs. 4.10
Jan. 20	Received from vendor	300 units @ Rs. 4.50
Jan. 25	Received from vendor	400 units @ Rs. 4.00

Issued of material were as follows:

Jan. 4 - 200 units

Jan. 10 - 400 units

Jan. 15 - 100 units

Jan. 19 - 100 units

Jan. 26 - 200 units

Jan. 30 - 250 units

Issued are to be priced on the principle of 'Last In First Out'. Write out the store Ledger Account in respect of the materials for the month of January.

[Madras, B.Com(CS) (SYSE) April 2009]

[Ans : Closing stock : 300 units Rs. 1,325
 $(50 \times 4 + 250 \times 4.50)$]

(C) FIFO and LIFO methods

59. X Company has purchased and issued materials as under :

1998	Stock of materials	200 units at Rs. 2.50 per unit
June 1	Purchased	300 units at Rs. 3 per unit
3	Purchased	500 units at Rs. 4 per unit
7	Issued	600 units
10	Purchased	400 units at Rs. 4 per unit
12	Issued	500 units
18	Purchased	400 units at Rs. 5 per unit
24	Issued	200 units
28	Issued	

Prepare the stores ledger under FIFO method and LIFO method.

[Madras, B.Com., (ICE) May 2000 (old);
B.Com., (ICE), C&M, May 1999]

[Ans : Closing Stock : FIFO : 500 units
valued at Rs. 2,400 ($100 \times 4 + 400 \times 5$);
LIFO: 500 units valued at Rs. 1,800 ($200 \times 2.5 + 100 \times 3 + 200 \times 5$)]

60. The following information is provided by Sunrise Industries for the fortnight of April, 1998.

Material stock on 1-4-1998 100 units at Rs. 5 per unit

Purchases	
5-4-98	300 units at Rs. 6
8-4-98	500 units at Rs. 7
12-4-98	600 units at Rs. 8
Issues	
6-4-98	250 units
10-4-98	400 units
14-4-98	500 units

Required:

Calculate using FIFO and LIFO methods of pricing issues :

- (a) the value of material consumed during the period.
- (b) the value of stock of materials on 15-4-98.

[Madras, B.A. Corp., April 1999]
[Ans : (a) Value of materials consumed :

under FIFO : Rs. 7,800;

under LIFO : Rs. 8,300;

(b) Closing stock : FIFO – 350 units at Rs. 8 per unit : Rs. 2,800;

LIFO – 350 units valued at Rs. 2,300

($100 \times 5 + 50 \times 6 + 100 \times 7 + 100 \times 8$)

Materials

(FIFO and LIFO with returns & costs)

61. Enter the following transactions in the stores ledger of Y material using (i) FIFO and (ii) LIFO methods.

May 1980

1	Balance 250 units at Re. 1 per unit
3	Issued 50 units on material requisition No. 61.
6	Received 800 units, vide goods received [Note No. 13] at Rs. 1.10 per unit.
7	Issued 300 units on Material requisition No. 63.
8	Returned to stores 20 units issued on material requisition No. 61.
12	Received 300 units as per goods received note No. 15 at Rs. 1.20 per unit.
15	Issued 320 units [Material requisition No. 83]
18	Received 100 units, vide goods received note No. 77 at 1.20 per unit.
20	Issued 80 units [Material requisition No. 102]
23	Returned to vendors 20 units from goods received Note No. 77 received on 18th.
27	Received 200 units on goods received note No. 96 at Re. 1 per unit.
28	Freight paid on purchase [vide goods received note No. 96] Rs. 50.
30	Issued 250 units on material requisition No. 113.

[Madras, B.Com., April 1983]

[Ans : Closing stock : (i) FIFO – 650 units valued at Rs. 781
($50 \times 1.10 + 20 \times 1 + 300 \times 1.20 + 80 \times 1.20 + 200 \times 1 + 50$)

(ii) LIFO – 650 units valued at Rs. 695 ($200 \times 1 + 450 \times 1.10$)]

Note : 1. Returned to store is treated like a fresh receipt and issue is as per the method used.

2. Return to supplier is like an issue, but at the original purchase price
3. Freight paid should be added to the cost of the specific purchase.

(FIFO & LIFO with Returns and Losses)

62. From the following transactions, prepare separately the stores ledger account, using the following methods : (i) FIFO and (ii) LIFO.

Jan 1	Opening balance	100 units @ Rs. 5 each
5	Received	500 units @ Rs. 6 each
20	Issued	300 units
Feb 5	Issued	200 units
Feb 6	Received back from work order	10 units
	Issued on 5th February	
Feb 7	Received	600 units @ Rs. 5 each
Feb 20	Issued	300 units
Feb 25	Returned to supplier	50 units purchased on 7th February
Feb 26	Issued	200 units
March 10	Received	500 units at Rs. 7 per unit
March 15	Issued	300 units

Stock verification on 15th March revealed a shortage of 10 units.

[Ans : Closing Stock : (i) FIFO – 350 Units valued at Rs. 7 each, Rs. 2,450; (ii) LIFO – 350 units valued at Rs. 2,140
 $(100 \times 5 + 10 \times 6 + 50 \times 5 + 190 \times 7)$]

(D) HIFO (Highest in First out method)

63. Prepare a stores ledger account assuming that issues are priced on the principle of highest in first out.

Dec.		
1	Received	1,000 units at Rs. 20 per unit
10	Received	500 units at Rs. 22 per unit
11	Received	200 units at Rs. 21 per unit
15	Issued	500 units
20	Issued	150 units
22	Received	700 units at Rs. 23 per unit
24	Received	300 units at Rs. 19 per unit
28	Issued	500 units
30	Received	200 units at Rs. 18 per unit
31	Issued	300 units.

[Ans : Closing stock – 1,450 units, valued at Rs. 28,300 $(950 \times 20 + 300 \times 19 + 200 \times 18)$]

(E) Specific Price with FIFO

64. From the following information prepare a stores ledger account under specific pricing with FIFO.

April 1	Opening balance	50 Kgs. at Rs. 10
April 2	Issued	30 Kgs.
April 4	Purchased	60 Kgs. @ Rs. 11
April 5	Purchased	50 Kgs. at Rs. 12 for a specific job to be issued on 15th April.
April 6	Issued	25 Kgs.
April 10	Purchased	50 Kgs. at Rs. 10
April 16	Issued	60 Kgs.
April 25	Purchased	25 Kgs. at Rs. 12
April 30	Issued	35 Kgs.

[Madras, B.Com. March 1993 adapted]

[Ans : Closing stock : 35 units valued at Rs. 400 $(10 \times 10 + 25 \times 12)$]

Hint : The lot purchased on April 5 is to be reserved and issued to specific job on April 15.

(F) Specific price with LIFO

65. Prepare a stores ledger account for material 'X' for March 1991, pricing the material on the basis of LIFO with specific pricing.

Date	Receipt Quantity	Rate Rs.	Issue Quantity
1-3-1991	200	20	-
4-3-1991	-	-	100
5-3-1991	30 for issue for a job on 12th	21	
10-3-1991	300	18	-
20-3-1991	-	-	250
30-3-1991	100	16	-
31-3-1991	-	-	100

[Pondicherry, B.Com., April 1992 Adapted]

[Ans : Closing Stock : 150 units valued at Rs. 2,900
 $(100 \times 20 + 50 \times 18)$]

Hint : The quantity purchased on 5th March is to be issued to a specific job on 12th March.

3.120

(G) Base stock with FIFO

66. The following receipts and issues were made for a material during the month of May 1993.

Receipts	Balance of Stock	
1-5-93	Balance of Stock	500 units @ Rs. 4.50 per unit
7-5-93	Purchases	400 units @ Rs. 5.00 per unit
15-5-93	Purchases	1,000 units @ Rs. 5.5 per unit
23-5-93	Purchases	700 units @ Rs. 4.8 per unit
Issues		
3-5-93	Issue 200 units	
8-5-93	Issue 100 units	
17-5-93	Issue 700 units	
26-5-93	Issue 700 units	

Assume that base stock is 200 units out of opening stock, use FIFO method.

[Madras, B.Com., 1994 Adapted]

$$\begin{aligned} \text{Ans : Closing stock : Base stock } 200 \text{ units at Rs. } 4.50 &= \text{Rs. } 900 \\ \text{Other stock } 700 \text{ units at Rs. } 4.8 &= \text{Rs. } 3,360 \\ \text{Total stock } 900 \text{ units, valued at Rs. } 4,260 \end{aligned}$$

Hint : Base stock of 200 units at Rs. 4.50 out of the opening stock should always be a part of the stock and should not be issued.

(H) Base stock with LIFO

67. From the following particulars write up the stores ledger card :

1990		
January 1	Purchased	500 tons at Rs. 2 per ton.
10	Purchased	300 tons at Rs. 2.10 per ton.
13	Issued	500 tons
20	Purchased	400 tons at Rs. 2.20 per ton.
25	Issued	300 tons
27	Purchased	500 tons at Rs. 2.10 per ton.
31	Issued	200 tons

Adopt base stock method with LIFO. Base stock is 200 tons out of the Jan 1 purchase.

[Bharathidasan, B.A., April 1992]

$$\begin{aligned} \text{Ans : Closing stock : Base stock } 200 \text{ tons at Rs. } 2 \text{ each} &= \text{Rs. } 400; \\ \text{Others stock } 500 \text{ tons valued at Rs. } 1,050; \\ (100 \times 2 + 100 \times 2.2 + 300 \times 2.10) \end{aligned}$$

3.121

Materials

68. From the following information prepare stores ledger account.

Jan.	
1	Purchased 500 kg at Rs. 2
10	Purchased 300 kg at Rs. 3
15	Issued 600 kg
20	Purchased 400 kg at Rs. 4
25	Issued 300 kg
27	Purchased 500 kg at Rs. 3
31	Issued 200 kg

Adopt the base stock method of issue and ascertain the value of closing stock, base stock 200 kg.

[Madras, B.Com(gen & AF) April 2009]

[Ans: Closing stock Rs. 1,600 ($200 \times 2 + 400 \times 3$)]

(I) Simple Average Method

69. The following transactions took place in respect of an item of Material.

	Receipt Quantity K.G.S.	Rate Rs.P.	Issue Quantity K.G.S.
2-3-02	200	2.00	-
10-3-02	300	2.40	-
15-3-02	-	-	250
18-3-02	250	2.60	-
20-3-02	-	-	200

Record the above transactions in stores Ledger, pricing issues at simple average rate.

[Thiruvalluvar BBA April/May 2010; Bharathi, B.Com., Nov. 2007]

[Madras, B.Com(gen & AF) April 2010; B.Com(CS)

(ICE) Oct. 2008; B.Com(PZ5A) Nov. 2007; B.Com., Oct. 2003;

B.C.A./B.Sc., April 2002; Oct. 2001]

[Ans : Closing stock : 300 units valued at Rs. 720]

70. The following particulars have been extracted in respect of material X. Prepare ledger account showing the receipts and issues, pricing the materials issued on the basis of Simple Average Method.

Receipts:

3.10.2004	Purchased 500 units @ Rs. 4.00 per unit
13.10.2004	Purchased 900 units @ Rs. 4.30 per unit
23.10.2004	Purchased 600 units @ Rs. 3.80 per unit

Issues:

5.10.2004	Issued 400 units
15.10.2004	Issued 600 units
25.10.2004	Issued 600 units

[Madras, B.Com(PZ5A) Nov. 2005]

[Ans : Closing stock: 400 units;

Value : Rs. 1,630]

71. Prepare a stores ledger account and enter the following transactions adopting the simple average method of pricing out issues.

		1985	
February	1	Opening balance	50 units at Rs. 3 per unit
	5	Issued	20 units
	7	Purchased	40 units at Rs. 4 per unit
	9	Issued	25 units
	19	Purchased	75 units at Rs. 5 per unit
	20	Issued	15 units
	21	Received back	10 units out of Feb. 9 issue
	26	Issued	60 units

[Madras, B.Com., Sept. 1986]

[Ans : Closing stock 55 units valued at Rs. 262.50]

(J) Weighted Average Method

72. The following transactions took place in respect of a material item.

Date	Receipt Quantity	Rate	Issue Quantity
2-3-2002	200	Rs. 2.00	—
10-3-2002	300	Rs. 2.40	—
15-3-2002	—	—	250
18-3-2002	250	Rs. 2.60	—
20-3-2002	—	—	200

Prepare a stores ledger sheet, pricing the issues at weighted average rate.

[Bharathiar, B.Com., Nov. 2007; April 2007]

[Madras, B.Com.(gen & AF) April 2010; B.Com(PZSA)
Nov. 2007; B.C.A./B.Sc., April 2002]

[Ans : Closing stock 300 units at Rs. 2.42 = Rs. 726]

73. XY Ltd. purchased and issued the materials in the following order :

1985 March		
1	Purchased	300 units at Rs. 3 per unit
5	Purchased	500 units at Rs. 4 per unit
10	Issued	500 units
12	Purchased	700 units at Rs. 4.50 per unit
15	Issued	700 units
20	Purchased	300 units at Rs. 5 per unit
30	Issued	150 units

Ascertain the quantity of closing stock as on 31st March and state its value under "Weighted average cost" method.

[Madras, B.Com., March 1986]

[Ans : Closing Stock : 450 units at Rs. 4.61875 = Rs. 2,078]

74. (Returns)

From the following details of stores receipts and issues of material 'A' in a concern prepare the store ledger using weighted average method of valuing the issues.

Nov. 1	Opening stock	2,000 units at Rs. 5.00 each
Nov. 3	Issued	1,500 units to production.
Nov. 10	Received	4,500 units at Rs. 6 each.
Nov. 12	Returned to stores	100 units by production department.
(From the issue of Nov. 3)		

[Madras, B.A. Corp., March 1997]

[Ans : Closing Stock : 5,100 units at Rs. 5.8824 = Rs. 30,000]

75. (Returns)

Prepare a stores ledger A/c by adopting the weighted average method of pricing.

2004

Sept. 1	Opening balance	50 units at Rs. 3 per unit
4	Issued	2 units
8	Purchased	48 units at Rs. 4 per unit
9	Issued	20 units
15	Purchased	76 units at Rs. 3 per unit
22	Received back into stores	19 units out of 20 units issued on Sept. 9th.
30	Issued to production	10 units.

[Madras, BCA/B.Sc.(ICE) May 2005 (10 Times)]

B.Com., Oct. 1998]

[Ans : Closing stock : 161 units at Rs. 3.27778 = Rs. 527.72]

(K) Simple average and Weighted Average Methods

76. Show the stores ledger entries as they would appear when using :

- (a) The simple average method and
- (b) The weighted average method of pricing issues in connection with the following transactions :

1993		Units	Price Rs.
May	1	Balance in hand b/f	300
	2	Purchased	200
	4	Issued	150
	6	Purchased	200
	11	Issued	150
	19	Issued	200
	22	Purchased	200
	27	Issued	150

[Madras, B.Com., Sept. 1995]

[Ans : Closing Stock : (a) 250 units valued at Rs. 537.5;

(b) 250 units at Rs. 2.28 = Rs. 570]

77. The following transactions occur in the purchase and issue of a material.

Jan 2	Purchased	4,000 units at Rs. 4.00 per unit
20	Purchased	500 units at Rs. 5.00 per unit
Feb 5	Issued	2,000 units
10	Purchased	6,000 units at Rs. 6.00 per unit
12	Issued	4,000 units
Mar 2	Issued	1,000 units
5	Issued	2,000 units
15	Purchased	4,500 units at Rs. 5.50 per unit
20	Issued	3,000 units

Prepare stores ledger account using

(a) Simple Average Method (b) Weighted Average Method.

[Madras, B.Com. C&M, Sept. 1996]

[Ans : Closing Stocks : (a) 3,000 units valued at Rs. 15,000;
 (b) 3,000 units at Rs. 5.4863 per unit = Rs. 16,459]

78. The following receipts and issues were made of materials during the month of May

93. Prepare the stores ledger account on the basis of (a) Simple average and (b) Weighted Average.

Receipts

1-5-93	Opening balance of stock	300 units at Rs. 4.50 per unit
7-5-93	Purchases	400 units at Rs. 5.00 per unit
15-5-93	Purchases	1,000 units at Rs. 5.50 per unit
23-5-93	Purchases	700 units at Rs. 4.80 per unit

Issues

3-5-93	Issue	300 units
8-5-93	Issue	100 units
17-5-93	Issue	700 units
26-5-93	Issue	700 units.

[Madras, B.Com., March 1994]

[Ans : Closing stock : (a) 600 units valued at Rs. 3,080;
 (b) 600 units at Rs. 5.07 per unit = Rs. 3,042]

(L) Simple Average and other methods

79.

1987		
Jan 5	Purchased	4,000 units at Rs. 4 per unit
20	Purchased	500 units at Rs. 5 per unit
Feb 5	Issued	2,000 units
10	Purchased	6,000 units at Rs. 6 per unit
15	Issued	4,000 units
18	Issued	1,000 units
March 4	Issued	2,000 units
12	Purchased	4,500 units at Rs. 5.50 per unit
24	Issued	3,000 units.

From the above particulars prepare stores ledger account under
 (i) LIFO method.
 (ii) Simple average method.

[Madras, B.Com. Sept. 1988]

[Ans : Closing stock : (i) 3,000 units valued at Rs. 14,250
 $(1,500 \times 4 + 1,500 \times 5.5)$

(ii) 3,000 units valued at Rs. 15,000]

(M) Weighted Average and other methods

80. Show the stores ledger entries as they would appear when using (1) the weighted average method. (ii) the LIFO method of pricing issues, in connection with the following transactions :

April		Units	Value
			Rs.
1	Balance in hand b/f	300	600
2	Purchased	200	440
4	Issued	150	-
6	Purchased	200	460
11	Issued	150	-
19	Issued	200	-
22	Purchased	200	480
27	Issued	250	-

[Madras, B.Com. Oct. 1999;

B.A. Cop. Sept. 1989]

[Ans : Closing Stock : (i) 150 units at Rs. 2.28 = Rs. 342;
 (ii) 150 units valued at Rs. 300]

81. The following information is extracted from the stores ledger.

Opening stock	Material X
Purchases :	Nil
Jan. 1	100 at Rs. 1 per unit
Jan. 20	100 at Rs. 2 per unit
Issues :	
Jan 22	60 for job W-16
Jan 23	60 for job W-17

Complete the receipts and issues valuation by adopting the FIFO, LIFO and the weighted average methods.

[Madras, B.Com.(CS) (SY3A) April 2009; B.Com. C&M, Sept. 1995]

[Ans : Value of closing stock :

(1) Under FIFO Rs. 160 (80 units at Rs. 2 each);

(2) Under LIFO Rs. 80 (80 units at Re. 1 each);

(3) Under weighted average Rs. 120 (80 units at Rs. 1.5 each)]

82. X Ltd. has purchased and issued the material on the following order:

Jan 1	Purchased	300 units at Rs. 3 per unit
4	Purchased	600 units at Rs. 4 per unit
6	Issued	500 units
10	Purchased	700 units at Rs. 4 per unit
15	Issued	800 units
20	Purchased	300 units at Rs. 5 per unit
23	Issued	100 units.

Prepare store ledger account. Ascertain the quantity of closing stock as on 31st January and state what will be its value (in each case) if issues are made under the following methods.

(a) Average cost (b) FIFO (c) LIFO

[Madras, B.C.A./B.Sc., Oct. 2001 (ICE) April 2001;
B.Com. Sept. 1992]

[Ans : Closing Stock : (a) Under weighted average method,
500 units at Rs. 4.438 per unit = Rs. 2,220;

(b) Under FIFO method 500 units valued at Rs. 2,300 ($200 \times 4 + 300 \times 5$);

(c) Under LIFO method : 500 units valued at Rs. 1,900 ($300 \times 3 + 200 \times 5$)]

(N) Standard Price Method

83. The standard price of a material is fixed at Rs. 20 per unit. Show the stores ledger entries as they would appear when using the standard price method.

	Units	Rate Rs.
1	Balance in hand b/f	400
4	Purchased	500
6	Issued	600
8	Issued	200
10	Purchased	700
12	Issued	150
14	Issued	200
16	Issued	100
19	Purchased	800
20	Issued	400
25	Issued	300

Calculate the material price variance.

[Ans : Closing Balance 450 units valued at Rs. 10,400;
Material price variance Rs. 1,400 (Adverse)]

84. (Computation of standard price and variance)

With the help of the following information, prepare the stores ledger card based on the Standard price method.

Aug.	2004	Kgs.	Rs.
1	Opening balance	2,000 @	11 per unit
2	Purchased	3,000 @	12 per unit
3	Issued	2,500	
5	Issued	500	
8	Purchased	1,000 @	13 per unit
10	Issued	500	
15	Issued	200	
18	Issued	100	
20	Purchased	1,000	11 per unit
28	Issued	500	
30	Issued	200	

The credit balance of material price variance was Rs. 1,000 on 1st August 2004.

$$\text{[Ans : Standard Price} = \frac{\text{Value of Op. Stock} - \text{Credit bal. of Mat. Price Variance}}{\text{No. of Opening stock units}}$$

$$= \frac{22,000 - 1,000}{2,000} = \text{Rs. } 10.5;$$

Closing Stock = 2,500 units valued at Rs. 34,750

Closing Material price variance = 26,250 - 34,750
= Rs. - 8,500 (Adverse)]

(O) Inflated price method :

85. A Consignment consisted of two chemicals A and B. The invoice gives you the following data. Chemical A 4,000 units at Rs. 25 per unit. Chemical B 3,200 units at Rs. 32.50 per unit. Sales tax Rs. 8,160. Railway freight Rs. 3,840. A shortage of 200 units in chemical A and 128 units in chemical B was noticed due to breakage. What is the stock price you would adopt for pricing issues, assuming a provision of 5% towards further loss?

[Bangalore, B.Com.]

[Ans : Issue price : Chemical A : Rs. 29.40 per unit;
Chemical B : Rs. 37.65 per unit]

Hint : Refer Illustration 33 Page 3.88.

(P) Inventory valuation under different methods

86. The Burma Oil Company closes its accounts at the end of each month:

The following information is available for the month of June 2005.

June 2005:	Rs.
Sales	2,50,000
Administrative expenses	5,000
Inventory: June 1, 50 tons @ Rs. 1,000	50,000
Purchases including carriage inward:	
June 10, 150 tons @ Rs. 800	1,20,000
June 20, 150 tons @ Rs. 900	1,35,000
Inventory: June 30, 100 tons	

Compute the following data by the FIFO method:

- (i) Inventory valuation on June 30
- (ii) Amount of cost of goods sold for June
- (iii) Profit or loss for June.

[Periyar, M.Com(CA), M.Com., April/May 2005]

[Ans: (i) Rs. 90,000 (100×900); (ii) Rs. 2,15,000; (iii) Rs. 30,000]

87. A public company had stock of 200 units at Rs. 5 per unit as on 1-2-2005. The following were the purchases made during February 2005.

Feb 5th	300 units at Rs. 6 per unit
Feb 10th	600 units at Rs. 7 per unit
Feb 20th	800 units at Rs. 8 per unit
Feb 25th	400 units at Rs. 5 per unit

The physical stock on 28-2-2005 was 1,300 units. What would be the value of closing stock on 28-2-2005 if the material were issued according to

- (1) FIFO method
- (2) LIFO method
- (3) Average method?

[Ans : Value of closing stock :

(1) FIFO method - 1,300 units valued at Rs. 9,100

$$(100 \times 7 + 800 \times 8 + 400 \times 5)$$

(2) LIFO method - 1300 units valued at Rs. 8,600

$$(200 \times 5 + 300 \times 6 + 600 \times 7 + 200 \times 8)$$

(3) Average method - 1,300 units at Rs. 7 per unit = Rs. 9,100]

Chapter 4

Labour

I. COMPUTATION AND CONTROL OF LABOUR COST

I. Introduction

Labour cost is an important element of cost. It also forms significant part of prime cost and total cost. Labour costs are associated with human beings. This association makes it a significant item of cost not only because of huge wage bill of modern organisations but also because labour cost has certain special features which other elements like material do not possess. The human element makes the control of labour cost difficult. Labour is the most perishable commodity. Once unused it cannot be recovered and the labour cost is bound to increase cost of production. At the same time labour is the only factor which has the unlimited productive capacity. In many instances labour can achieve wonders in regard to the amount and quality of work performed by them. However, labour is complex and therefore it requires systematic planning and control.

2. Types of Labour

As in the case of materials, labour is also classified into (a) direct labour and (b) indirect labour.

(a) Direct labour cost is cost of labour expended in altering the construction, composition or condition of the product. Direct labour cost is easily identified and allocated to cost units. It fluctuates in proportion to output. It can be easily ascertained and allocated because of its close relationship with the output.

(b) Indirect labour cost is the amount of wages paid to workmen who are not directly involved in altering the composition of the product. Examples of indirect labour cost are remuneration to sweepers, helpers, watchmen, mechanics and supervisors. The indirect labour cost cannot be identified and allocated to cost units.

Strictly speaking the main difference between direct and indirect labour cost is based not only on the nature of work done but also on the basis of practicability and expediency. If a particular worker spends considerable time on a specific job which makes the identification of his time to the job practicable the wages of worker becomes direct. If both of these conditions are not satisfied