MATERIAL COSTS

Q1. What is just-in-time (JIT) system? List out its main benefits. **[Dec 18 - 5 Marks]**

Answer: Just-in-Time (JIT):

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

The benefits of Just-in-Time system are as follows:

(a) Increased emphasis on supplier relationships. A company without inventory does not want a supply system problem that creates a part shortage. This makes supplier relationships extremely important.

(b) Supplies come in at regular intervals throughout the production day. Supply is synchronized with production demand and the optimal amount of inventory is on hand at any time. When parts move directly from the truck to the point of assembly, the need for storage facilities is reduced.

(c) Reduces the working capital requirements, as very little inventory is maintained.

(d) Minimizes storage space.

(e) Reduces the chance of inventory obsolescence or damage.

Q2. Write Short Notes on Perpetual Inventory System: **[Dec 21 - 3 marks]**

Answer: Perpetual Inventory System means continuous stock taking. CIMA defines Perpetual Inventory System as 'the recording as they occur of receipts, issues and resulting balances of individual items of stock in either quantity or quantity and value'. Under this system a continuous record of receipt and issue of materials is maintained by the stores department and the information about the stock of materials is always available. Entries in the Bin card and stores ledger are made after every receipt and issue and the balance is reconciled on regular basis with the physical stock. The main advantage of this system is that it avoids disruptions in the production caused by periodic stock taking. It's a very reliable check on the stocks.

Q3. What is just in time (JIT)? Discuss what are the advantage of JIT (any 3). **[Dec 22 - 5 marks]**

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

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(c) Reduces the working capital requirements, as very little inventory is maintained.

(d) Minimizes storage space.

(e) Reduces the chance of inventory obsolescence or damage.

Q4. State two main differences between scrap and spoilage. **[Dec 15 & June 23 - 2 Marks]**

Answer:

- **Scrap** is a residual material resulting from a manufacturing process. It has a recovery value and is measurable. Its treatment in cost account will depend on the total value of scrap.
- **For the control purposes, scrap could be divided into:** legitimate scrap, administrative scrap and defective scrap.
- It can be controlled through selection of right type of material and manpower, determination of acceptable limits of scrap and reporting the source of waste.
- **Spoilage** is the production that fails to meet quality or dimensional requirements and so much damaged in manufacturing operations that they are not capable of rectification and hence have to be withdrawn and sold off without further processing.
- Rectification can be done but its costs may be uneconomic.

Q5. How will you treat the Spoiled Work in Cost Accounts? **[Dec 16 - 2.5 Marks]**

Answer: If it is inherent to the nature of job or production and is normal, it is charged to the specific job or as an overhead for the entire production if there is no specific job. Abnormal spoilage should be charged to the Costing Profit and Loss Account. Any proceeds or recoveries should be credited to the account where the spoilage was debited.

Q6. What is Economic Order Quantity (EOQ)? State the assumptions underlying EOQ. **[June 18 - 5 marks]**

Answer: EOQ is the size of the order for which both ordering and carrying costs are minimum.

Assumptions underlying EOQ:

(a) Ordering Cost per order and Carrying Cost per unit per annum are known and they are fixed.

(b) Anticipated usage of material in units in known.

(c) Cost per unit of the material is constant and is known as well.

(d) The quantity of material ordered is received immediately i.e. lead time is zero.

Q7. Describe the main objectives of Material Control System. **[Dec 19 - 5 marks]**

Answer:

(a) To make continuous availability of materials so that there may be uninterrupted flow of materials for production. Production may not be held up for want of materials.

(b) To purchase requisite quantity of materials to avoid locking up of working capital and to minimise risk of surplus and obsolete stores.

(c) To make purchase competitively and wisely at the most economical prices so that there may be reduction in cost of materials.

(d) To purchase proper quantity of materials to have minimum possible wastage of materials.

(e) To serve as an information center on the knowledge in respect of materials for prices, sources of supply, lead time, quality and specification.

Q8. What is Bill of Materials? What are basic purposes of preparing a Bill of Materials? **[Dec 23 - 5 Marks]**

Answer:

Bill of Material is a complete schedule of parts and materials required for a particular order prepared by the drawing office and issued by it together with necessary blue prints of drawings. For standard products, printed copies of bill of material are kept with blank spaces for any special details of modification to be filled in for a particular job order. The schedule details everything, even to bolts and nuts, sizes and weights.

The documents solve a number of useful purposes, such as:

(a) It provides a quantitative estimate of budget of material required for a given job, process or operation which might be used for control purposes.

(b) It substitutes material requisitions and expedite issue of materials.

(c) The store keeper can draw up a programme of material purchases and issue for a given period.

(d) It provides the basis for charging material cost to the respective job/process.

Q9. Discuss the advantages of ABC analysis

Answer:

The advantages of ABC analysis are as follows:

(a) Closer and stricter control of those items which represent a major portion of total stock value is maintained.

(b) Investment in inventory can be regulated and funds can be utilized in the best possible manner. 'A' class items are ordered as and when need arises, so that the working capital can be utilized in a best possible way.

(c) With greater control over the inventories, savings in material cost can be realized.

(d) It helps in maintaining enough safety stock for 'C' category items.

(e) Scientific and selective control helps in the maintenance of high stock turnover ratio.

Q10. The following is an extract of stores ledger of a particular item of stock with incomplete information for October 2013. You are required to fill in the rate column pf issues correct to two decimal places. Also fill in the values under the 'Balance column' wherever indicated with a Identify the method of stock issue followed by the company. How would you treat the value of the shortages on 30 Oct in Cost Accounts? **[Dec 13 - 8 Marks]**

Date	Receipts		Issues		Balance	
Oct 2013	Quantity (Kg)	Rate (Rs. / Kg)	Quantity (Kg)	Rate (Rs. / Kg)	Quantity (Kg)	Value (Rs.)
1					50,000	1,25,000
7	5,000	2.4				
10			30,000			62,000
15			20,000			
20	15,000	2.6				
25	10,000	2.5				
29			20,000			
30 shortage normal loss			200			?
30 shortage abnormal loss			400			?
31					9,400	?

Answer:

Date	Receipts		Issues		Balance	
	Quantity (kg)	Rate (Rs. / kg)	Quantity (kg)	Rate (Rs. / kg)	Quantity (kg)	Value Rs.
01.10.2013	-	-	-	-	50,000	1,25,000
07.10.2013	5,000	2.40	-	-	55,000	1,37,000
10.10.2013	-	-	30,000	2.50	25,000	62,000
15.10.2013	-	-	20,000	2.50	5,000	12,000
20.10.2013	15,000	2.60	-	-	20,000	51,000
25.10.2013	10,000	2.50	-	-	30,000	76,000
29.10.2013			20,000	2.55 (51,000/20,000)	10,000	25,000
30.10.2013 (shortage Normal loss)	-	-	200	2.50	9,800	24,500
30.10.2013 (shortage Abnormal loss)			400	2.50	9,400	23,500
31.10.2013					9,400	23,500

Note:

1. Rate per unit = 1,25,000 + 12,000 - 62,000 = 75,000/30,000 = 2.50
2. Company has followed First in First Out method.
3. Abnormal Loss will be charged to Costing Profit & Loss A/C.

Q11. PC Company purchases a specialized item and the quantity to be purchased is 2500 pieces at a price of Rs. 200 per piece. Ordering cost per order is Rs. 200 and carrying cost is 2% per year of the inventory cost. Normal lead time is 20 days and safety stock are nil. Assume yearly working days as 250.

1. Calculate the Economic Ordering Quantity.
2. Re-order Inventory Level.
3. If a 2% discount on price is given for order quantity 1,250 pieces or more in a lot, should the company accept the offer of discount? **[Dec 13 - 8 marks]**

Answer:

1. Economic Ordering Quantity = $\sqrt{\frac{2AO}{C}} = \sqrt{\frac{2\times2,500\times200}{2\%\times200}}$ **= 500**

2. Reorder Inventory level = Normal lead time x normal usage = 20 x 2500/250 = 200

3. Minimum order quantity to get 2% discount = 1250 Pcs

Total Cost = Buying cost + Carrying Cost + Purchase Price

$= \frac{2,500}{1,250}$ x 200 + $\frac{1,250}{2}$ x 196 x 2% + 2,500 x 196

= 400 + 2,450 + 4,90,000 **= Rs. 4,92,850**

Total Cost quantity ordered Is 500 pcs.

Total Cost = $\frac{2,500}{500}$ x 200 + $\frac{500}{2}$ x 200 x 2% + 2,500 x 200

= 1,000 + 1,000 + 5,00,000 **= Rs. 5,02,000**

Based on EOQ total cost is more than total cost at discount offer, hence discount offer should be availed.

Q12. Manufacture of each unit of Product X requires 2 kgs. each of raw materials A, B and C. There was no opening stock of any material. Following transactions took place in production period relating to purchase of raw materials: **[Dec 13 - 8 marks]**

A's supplier charged Rs. 10,000 for 100 kgs. of A. Additionally, insurance was Rs. 600 and the freight to get A to the store was Rs. 800.

B's invoice price showed Rs. 12,000 charged by the supplier for 100 kgs. Freight was Rs. 800, which was included in the Rs. 12,000. There was no insurance. B had a normal evaporation loss of 10% in transit. A further abnormal loss of 20 kg of B was reported due to a small accident in transit. Rs. 200 was recovered from the transporter.

C's supplier charged Rs. 15,000 for 120 kgs. of C. C absorbs moisture on exposure to the outside air and by the time it came to the store, it weighed 150 kgs. This is a normal feature of C.

Materials were issued to production as per requirement. Compute the material cost per unit of X corrected to two decimal places, using the Generally Accepted Cost Accounting Principles for material cost and giving the break-up of each raw material.

Answer:

Particular	Quantity	Value			
Material A:					
Invoice Price	100	10,000			
Insurance		600			
Freight		800			
Total Cost	**100**	**11,400**	**Rs. / kg of A =**		**114**
Material B	100	12,000			
Normal loss 10%	10				
	90	**12,000**	**Rs. / kg of B =**		**133.3333**
Abnormal loss	20	2,666.667			
Material C	120	15,000			
Normal gain	30				
Total	**150**	**15,000**	**Rs. / kg of C =**		**100**
Material Cost of X					
A: 2 kgs	2	X	114	=	228
B: 2 kgs	2	X	133.3333	=	266.67
C: 2 kgs	2	X	100	=	200
Total material cost per unit of X					**694.67**

Freight till the shop floor and insurance are part of material cost or shows the addition of these items in material A,

B: Normal loss charged to material cost as per GACP. It should either write this or show the working for normal loss of B

B: Abnormal loss is not charged to production. It is written off to the Costing P & L A/c. Either this has to be written or the workings shown in B to state how much abnormal loss is excluded as above.

Q13. The annual demand for an item is 3200 units. The unit cost is Rs. 6 and the inventory carrying cost is 25% per annum. If the cost of one procurement is Rs. 150, determine the time between two consecutive orders, assuming procurement is at EOQ. **[June 14 - 2 Marks]**

Answer:

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

$$= \sqrt{\frac{2 \times 150 \times 3,200}{6 \times 25\%}}$$

$$= \sqrt{\frac{9,60,000}{1.5}} = \textbf{800 units}$$

No. of orders per year = $\frac{3200}{800}$ = 4.

Hence, Time between 2 orders = $\frac{12}{4}$ = 3 months.

Q14. The opening stock, closing stock and purchases of materials were respectively 10,000, 16,000 and 84,000 during a production period. Compute the inventory turnover ratio. **[June 14 - 2 Marks]**

Answer:

Inventory Turnover Ratio = $\frac{\text{Cost of material used}}{\text{Average Stock}} = \frac{10,000 + 84,000 - 16,000}{(10,000 + 16,000)/2} = \frac{78,000}{13,000}$ = **6 times.**

Q15. 200 kg. of a certain material valued at Rs. 50 per kg. were issued from the Stores Department to the Production Department, During transit, 2 kg. physically disappeared due to shrinkage (1% shrinkage is considered normal) In the production process, the yield of good output was 80% of the input. 8% of the input had a slightly substandard dimension and this can be sold as seconds in the market at a discount of 25% of the selling price of good output, which is Rs. 300 per kg. 12% of the input emerged as trimmings in the process. This was collected and can be sold in the market at a net price of Rs. 20 per kg. which is credited to the manufacturing overhead as per the company's practice.

Explain with reasons, the quantities that you will classify as (1) waste, (2) scrap and (3) spoilage.

What will be the material cost per unit of the good output? (A simply computed value will suffice. A detailed statement is not required) **[June 14 - 8 marks]**

Answer:

Material issued to production	200 kg
Less: Shrinkage (1% of 200)	2kg
Input	198 kg
Less: 12% of 198 trimming	23.76 kg
	174.24 kg
Less: 8% substandard (8% of 198)	15.84 kg
Output	**158.40**

1. **Waste:** As waste has practically no value, its accounting is relatively simple. The effect of the waste is to reduce the quantity of output. In order to arrive at the unit cost of the process, operation, or job, the total cost of the process, etc., is distributed over the reduced output, i.e., the units of good production only. -The cost of abnormal waste', should, however, be excluded from the total cost and charged to the Profit and Loss Account.

   Waste generated = 2kg

2. **Scrap:** Scrap is the form of incidental material residue coming out of certain types of manufacturing processes but it is usually in small amounts and has low measurable utility or market value, recoverable' without further processing. Scrap is discarded material having some value.

   Scrap generated = 23.76kg

3. **Spoilage:** Spoilage arises when the production output is damaged in such a manner and to such an extent that it cannot be used for the original purpose for which it was designed but is to be disposed off in some suitable manner without further processing. Spoilage involves not only the loss of material but also labour and manufacturing overheads.

   Spoilage = 15.84kg

   Cost of material (200 x 50) = Rs. 10,000.00

   Material cost per unit of output = $\frac{10,000}{158.4}$ = Rs. 63.13/unit.

Q16. Material with invoice value Rs. 10,000 was received in the Stores Dept. The transport cost was Rs. 200. Since the material leaked in transit, damage to other goods of Rs. 350 had to be paid to the transporter. What would be the material cost?

[Dec 14 - 2 marks]

Answer:

Material Invoice value	Rs. 10,000
Transport cost	Rs. 200
	Rs. 10,200

As per CAS - 6 material receipts are valued at purchase price including duties and taxes, freight inwards, insurance and other expenditure directly attributable to procurement of material.

Further any demurrage or detention charges or penalty levied by transport or other authority shall not form part of cost of material.

Q17. A manufacturing company buys its monthly requirement of 7500 units of material in 10 equal instalments every year. Purchase cost per unit is 15 and ordering cost is Rs. 450 per order. Inventory carrying cost is 15% p.a. At what quantity of purchase will the ordering costs equal the inventory carrying costs?

What is the total annual cost under the prevailing inventory policy? **[Dec 2014 - 8 marks]**

If the supplier is willing to offer a discount of 3% on supplies more than 22,500 per order, what would you recommend as the revised order quantity? Evaluate by comparison with the option of ordering at economic order quantity.

Answer:

Quantity to be ordered when buying cost equals carrying cost,

Let the quantity ordered be x $\frac{90,000}{x}$ x 450 = $\frac{x}{2}$ x 15 x 15%

X = 6,000 units

When 6,000 units are ordered at a time, buying cost will be equal to carrying cost.

Verification:

Buying cost = 90,000/6,000 x 450 = Rs. 6,750

Carrying cost = $\frac{6,000}{2}$ × 15 × 15% = Rs. 6,750

Given:

Monthly demand 7500 units

Annual demand 7500 x 12 = 90,000 units

No. of orders 10 per year

Statement of total annual cost

Particulars	Amount
Total purchase price (90,000 x 15)	13,50,000
Total buying cost (10 x 450)	4,500
Total carrying cost (90,000/10 x 1½ x 15x 15%)	10,125
Total cost	**13,64,625**

Q18. Naitik Limited produces a product Which has a weekly demand of 2500 units. The product requires 5 kg. material for every finished unit of product. Material is purchased at Rs. 104 per unit. The ordering cost is Rs. 200 per order and the carrying cost is 10% per annum.

1. Calculate Economic Order Quantity,
2. Should the company accept an offer of 3% discount by the supplier who wants to supply the annual requirement of the material in five equal instalments? **[June 15 - 8 marks]**

Answer:

1. Weekly demand = 2500 units

   Material requirement. = 5Kg. /unit

   Annual demand = 2500 x 5 x 52 = 6,50,000

Cost per Kg. = 104/5 = Rs. 20.8

Ordering Cost Rs. 200 per order

Carrying 10% per annum

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

$$= \sqrt{\frac{2 \times 6,50,000 \times 200}{20.8 \times 10\%}}$$

= 11,180kg.

2. Total annual cost when order size is EOQ:

Annual demand	= 6,50,000 Kg.
Total purchase price	= 6,50,000 x 20.8 = Rs. 1,35,20,000
Carrying Cost	= 11,180/2 x 20.8 x 10% = Rs. 11,627
Total buying Cost	= 6,50,000/11,180 x 200 = Rs. 11,628
Total Cost	**= Rs. 1,35,43,255**

Total annual cost when 5 orders are made:

Annual demand	= 6,50,000 Kg.
Numbers of orders	= 5
Order Size	= 6,50,000/5 = 1,30,000 Kg.
Purchase price/unit	= $20.8 - \frac{3}{100} \times 20.8 = 20.176$
Total purchase price	= 6,50,000 x 20.176 = Rs. 1,31,14,400
Carrying Cost	=1,30,000/2 x 20.176 x 10% = Rs. 1,31,144
Total buying Cost	= 5 x 200 = Rs. 1,000
Total Cost	**= Rs. 1,32,46,544**

As total cost is reducing when, discount is availed.

Hence, company should accept the offer.

Q19. A trading company starts its operation on 1.1.2014. Its stock register reveals the following data regarding the purchase of goods in 2014:

Jan to March	10,000 units @Rs. 10 each
April to June	12,500 units @ Rs. 14 each
July to Sep	7,500 units @ Rs. 16 each
Oct to Dec	15,000 units @ Rs. 17 each

The company sells 27,500 units by 31 Dec 2014. Value the closing stock by FIFO and LIFO methods and also find the cost of goods sold under each method. **[June 2015 - 4 marks]**

Answer: Total Quantity sold 27,500 units

Value of closing stock and cost of goods sold under FIFO Method Cost of goods sold:

10,000 units @ Rs. 10	Rs. 1,00,000
12,500 units @ Rs. 14	Rs. 1,75,000
5,000 units @ Rs. 16	Rs. 80,000
	Rs. 3,55,000

Value of closing stock by FIFO Method:

2,500 units @ Rs. 16	Rs. 40,000
15,000 units @ Rs. 17	Rs. 2,55,000
	Rs. 2,95,000

Value of closing stock and cost of goods sold under LIFO Method Cost of goods sold:

15,000 units @ Rs. 17	Rs. 2,55,000
7,500 units @ Rs. 16	Rs. 1,20,000
5,000 units @ Rs. 14	Rs. 70,000
	Rs. 4,45,000

Value of closing stock by FIFO Method:

10,000 units @ Rs. 10	Rs. 1,00,000
7,500 units @ Rs. 14	Rs. 1.05,000
	Rs. 2,05,000

Q20. A Ltd. was ordering (in economic order quantities) (EOQ) its raw material RM at a price of Rs. 750 per unit. The average annual consumption was 18000 units. Carrying cost was 20% of average inventory and the ordering cost was Rs. 1,500 per order. A Ltd. wants to move towards the Just-In-Time system and the new policy proposes as follows: the average number of units held in stock will be 100 units; ordering cost per order will be Rs. 1,510; carrying cost will be 20% of average inventory. However, the purchase price will increase. The total new ordering cost will be 9 times the new carrying cost.

(a) What was the EOQ before the new policy?

(b) Calculate the inventory turnover ratio before and after the new policy.

(c) How much is the increase in purchase price under the new policy?

Compare the two policies regarding raw material management and offer your comments. **[Dec 15 - 12 marks]**

Answer:

(a) Let, 'q' be the EOQ

At EOQ, ordering cost = Carrying cost

18,000/q x 1,500 = 750 x 20% x q/2

$q^2 = \frac{18,000 \times 1,500 \times 2}{750 \times 20\%}$

q = 600

Therefore, before the new policy the EOQ was 600 units.

(b) Inventory turnover ratio = $\frac{\text{Cost of goods sold}}{\text{Average inventory}}$

Before the new policy = $\frac{18,000 \times 750}{\frac{600}{2} \times 750} = \frac{18,000}{300}$ 60 times

After the new policy = $\frac{18,000 \times 750}{100 \times 750} = \frac{18,000}{100}$ = 180 times

(c) Let 'X' be the new purchase price

As per the question,

9 (20% x 100 x X) = (18000/200) x 1510 [assuming the EOQ = 100 x 2 = 200 units]

Or, 180 X = 1,35,900 Or, X = 755

Therefore, increase in purchase price is Rs. 5 p.u.

Comparison of policies

Particulars	Computation	Old policy	New policy
Purchase cost	18,000 x 750	1,35,00,000	
	18,000 x 755		1,35,90,000
Ordering cost	(18,000 / 600) x 1,500	45,000	
	(18,000 / 200) x 1,510		1,35,900
Carrying cost	20% of (600 / 2) x 750	45,000	
	20% of (200 / 2) x 755		15,100
Total		**1,35,90,000**	**1,37,41,000**

As the total cost is more in case of new policy, inventory management should be as per EOQ method.

Q21. Calculate the recorder level from the following data:

Lead time: 3 weeks; Safety stock: 100 units; Annual uniform usage: 2,600 units. **[June 16 - 2 Marks]**

Answer: Reorder level = Average usage x Average lead time + Safety stock

$= \frac{2,600}{52} \times 3 + 100$

= 250 units

Q22. A company requires 1,00,000 units of an item annually. The cost per unit is Rs. 10. Ordering cost is Rs. 500 per order and inventory carrying cost is 50% per unit per annum.

(a) Find the Economic Order Quantity (EOQ).

(b) The supplier offers a discount of 3% for order quantity 4500-5999 and 3.5% for order quantity 6000 and above. Work out a statement comparing the total inventory management costs for the EOQ, 4500 and 6000 units of order and comment on your findings. Advise the company on how much to order. **[June 16 - 10 Marks]**

Answer:

(a) $EOQ = \sqrt{\frac{2AO}{C}} = \sqrt{\frac{2 \times 1,00,000 \times 500}{10 \times \frac{50}{100}}}$

EOQ = $\sqrt{2,00,00,000}$ = 4,472 units (appx.)

(b) Total Inventory Cost under different options:

1. EOQ

Purchase Cost	1,00,000 x 10	10,00,000
Ordering Cost	(1,00,000/4472) x 500	11,180
Carrying Cost	4,472 x 10 x 0.5 x 0.5	11,180
Total		**10,22,360**

2. When order quantity is 4,500

Purchase Cost	1,00,000 x 9.7	9,70,000
Ordering Cost	(1,00,000/4,500) x 500	11,111
Carrying Cost	4,500 x 9.7 x 0.5 x 0.5	10,912
Total		**9,92,023**

3. When order quantity is 6,000

Purchase Cost	1,00,000 x 9.65	9,65,000
Ordering Cost	(1,00,000/6,000) x 500	8,333
Carrying Cost	6,000 x 9.65 x 0.5 x 0.5	14,475
Total		**9,87,808**

The company should order 6,000 units, as the total cost is minimum in that case.

Q23. The average quarterly consumption of a material is 5200 units. Unit cost is Rs. 65. Storage cost is 15% p.a. and the ordering cost is Rs. 150 per order. Find the Economic Order Quantity (EOQ). **[Dec 16 - 2 marks]**

Answer: Average annual consumption - 5200 x 4 = 20800 units.

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

$= \sqrt{\frac{2 \times 20,800 \times 150}{65 \times .15}}$

= 800 units

Q24. The following information is available relating to raw material movement in the month of Nov 2016:

Date (Nov 2016)	Details of quantities in number of units
1	Opening stock 500 at Rs. 200 per unit
3 to 5	Issue of 250 units
13	Received 200 units @ Rs. 190
14	Returned to Stores 15 units issued earlier to November at opening stock rate
16	Issue of 250 units
20	Receipt of 240 units @ Rs. 195
24	Issue of 290 units

You are required to compute the inventory turnover ratio for the month of November, 2016 using:

(i) FIFO and (ii) LIFO methods of pricing and comment on your findings. (A detailed stores ledger account is not required. Only relevant figures for the ratio need to be computed). **[Dec 16 - 10 Marks]**

Answer:

Date Nov	Receipts		Issue (FIFO)		Closing Stock (FIFO)			Issue (LIFO)		Closing Stock (LIFO)		
	Qty	Rate	Qty	Rate	Qty	Rate	Rs.	Qty	Rate	Qty	Rate	Rs.
1					500	200	1,00,000			500	200	1,00,000
3 - 5			250	200	250	200		250	200	250	200	
13	200	190										
14	15	200			250 200 15	200 190 200				250 200 15	200 190 200	
16			250	200	200 15	190 200		15 200 35	200 190 200	215	200	
20	240	195			200 15 240	190 200 195				215 240	200 195	
24			200 15 75	190 200 195	165	195	32,175	240 50	195 200	165	200	33,000
Total opening plus closing stock							1,32,175					1,33,000
Average stock							66,087.5	rft				66,500
Consumption Value (515 x 200 + 200 x 190 + 75 x 195)							1,55,625	(350 x 200 + 200 x 190 + 240 x 195)				1,54,800
Inventory Turnover ratio = Consumption/Avg. Invy.							2.35					2.33

Comment: Declining prices imply lower consumption cost under LIFO together with higher inventory value which reduces the numerator and increases the denominator and hence, the marginal reduction in the Inventory turnover ratio.

Q25. Two components A and B 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	A 4,800 units	B 7,200 units
Reorder period	A 4 to 6 weeks	B 2 to 4 weeks

Calculate for each component:

(a) Re-order level

(b) Minimum level

(c) Maximum level

(d) Average stock (Based on Re-order quantity) **[Dec 16 - 5 marks]**

Answer:

SN	Particulars	Component A	Component B
1	Re-order level	6 x 900 = 5400 units	4 x 900 = 3,600 units
2	Minimum Level	5,400-(600 x 5) = 2400 units	3,600 - (600 x 3) = 1,800 units
3	Maximum Level	5,400 + 4,800 - 1,200 = 9,000 units	3600 + 7200 - 600 = 10,200 units
4	Average stock level = Minimum level + ROQ/2	2,400 + 2,400 = 4800	1,800 + 3,600 = 5,400 units

Q26. The following summarized information is available from the records of Oil Ltd. for the month of. March, 2017:

Sales for the month: Rs. 19,25,000

Opening stock as on 1 March, 2017: 1,25,000 litres @ Rs. 6.50 per liter Purchases (including freight and insurance):

March 5	1,50,000 litres @ Rs. 7.10 per liter
March 27	1,00,000 litres @ Rs. 7.00 per liter

Closing stock as on 31 March, 2017 1,30,000 litres

Expenses for the month is Rs. 45,000. Pricing of material issues is being done at the end of the month after all receipts during the month.

On the basis of above information, calculate the following using FIFO and LIFO methods of pricing:

1. value of closing stock as on 31 March, 2017.
2. Cost of goods sold during March, 2017.
3. Profit or loss for March, 2017.

(A detailed stores ledger account is not required. Only relevant figures need to be Calculated). **[June 17 - 8 marks]**

Answer:

1. Valuation of closing stock as on 31.03.2017:

(a) **FIFO Method:** (the closing stock will comprise the items purchased in the end)

Particulars	Rs.
1,00,000 litres purchased on 27.03.2017 @ Rs. 7.00	7,00,000
30,000 litres from purchases made on 05.03.2017 @ Rs. 7.10	2,13,000
1,30,000 value of closing stock under FIFO method	9,13,000

(b) **LIFO Method:** (the closing stock will comprise the items lying in opening stock and purchased in the beginning)

Particulars	Rs.
1,25,000 litres from opening stock @ Rs. 6.50	8,12,500
5,000 litres from purchases made on 05.03.2017 @ Rs. 7.10	35,500
1,30,000 value of closing stock under LIFO method	8,48,000

2. Cost of Goods Sold:

Particulars	FIFO Method	LIFO Method
Opening stock as on 01.03.2017	8,12,500	8,12,500
Purchases made on 05.03.2017	10,65,000	10,65,000
Purchases made on 27.03.2017	7,00,000	7,00,000
Total	**25,77,500**	**25,77,500**

Less: Closing stock as per (1)	9,13,000	8,48,000
Cost of material consumed	16,64,500	17,29,500
Add: Expenses	45,000	45,000
Cost of goods sold	17,09,500	17,74,500

3. Profit for March, 2017:

Particulars	FIFO Method	LIFO Method
Sales	19,25,000	19,25,000
Cost of goods sold	17,09,500	17,74,500
Profit	2,15,500	1,50,500

Q27. From the following particulars with respect to a particular item of materials of a manufacturing company, calculate the best quantity to order:

Ordering quantities (tonne)	Price per ton (Rs.)
Less than 250	6.00
250 but less than 800	5.90
800 but less than 2,000	5.80
2,000 but less than 4,000	5.70
4,000 and above	5.60

The annual demand for the material is 4,000 tonnes. Stock holding costs are 25% of material cost p.a. The delivery cost per order is Rs. 6.00. **[Dec 17 - 8 marks]**

Answer: **Statement showing computation of total inventory cost at different order size:**

SN	Particulars	Ordering Quantities				
		200	**250**	**800**	**2,000**	**4,000**
1	Purchasing cost	24,000	23,600	23,200	22,800	22,400
2	No. of orders	20	16	5	2	1
3	Ordering Cost	120	96	30	12	6
4	Average size of orders	100	125	400	1,000	2,000
5	Inventory carrying cost per unit	1.5 (6x25%)	1.475 (5.9x25%)	1.45 (5.8x25%)	1.425 (5.7x25%)	1.4 (5.6x25%)
6	Inventory carrying cost (4) x (5)	150	184.375	580	1,425	2,800
7	Total inventory cost (1) + (3) + (6)	24,270	23,880	23,810	24,237	25,206

For the above computations the best quantity to order is 800 units.

Note: Minimum ordering quantity assumed to be 200 tons; it may be any quantity below 250 tons, but decision will be same.

Q28. ZEDYAAH TUBES LTD. manufactures a special product, which requires ZEDY. The following particulars were collected for the year 17-18:

Monthly demand of Zedy	7500 units
Cost of placing an order	Rs. 500
Re-order period	5 to 8 weeks
Cost per unit	Rs. 60
Carrying cost % p.a.	10%
Normal usage	500 units per week

Minimum usage	250 units per week
Maximum usage	750 units per week

Required: Calculate the following:

1. Re-order quantity
2. Re-order level
3. Minimum stock level
4. Maximum stock level
5. Average stock level **[Dec 18 - 7 marks]**

Answer:

Re-order quantity	$= \sqrt{\frac{2AB}{CS}}$ $= \sqrt{\frac{2 \times 7500 \times 12 \times 500}{60 \times 10\%}}$ $= \sqrt{\frac{9,00,00,000}{6}}$ $= \sqrt{1,50,00,000}$ = 3,873 units
Re-order level	= Maximum Usage x Maximum re-order period =750 x 8 = 6000 units
Minimum Stock level	= Re-order level - [Normal Usage x Normal re-order period or Average delivery time] =6000 - [500 x 6.5] = 6000 -3,250 = 2,750 units
Maximum Stock level	= Re-order level + Re-order quantity - [Minimum Usage x Minimum re-order period] = 6000 + 3,873 - [250 x 5] = 8,623 units
Average Stock level	= (Minimum Stock level + Maximum Stock level) / 2 = (2,750 + 8,623) / 2 = 5,687 units or,
	= Minimum Stock level + (1 / 2) (Re-order quantity) =2750 + (1/2) (3,873) = 4,687 units.

Q29. ZION LTD uses three types of materials A, B and C for production of Product - P for which the following data apply:

Raw Material	Usage per unit of Product (kgs)	Reorder Quantity (kgs)	Price per kg Rs.	Delivery period (in weeks)			Re-order Level (kgs)	Minimum Level (kgs)
				Minimum	Average	Maximum		
A	10	10000	0.10	1	2	3	8000	?
B	4	5000	0.30	3	4	5	4750	1550
C	6	10000	0.15	2	3	4	?	2000

Weekly production varies from 175 to 225 units, averaging 200 units of the said product.

What would be the following quantities?

(a) Minimum stock of A,

(b) Maximum stock of B,

(c) Re-order level of C,

(d) Average stock level of A. **[Dec 19 - 9 marks]**

Answer:

Minimum stock of A	Re-order level - (Average rate of consumption x Average time required to obtain fresh delivery) = 8,000 kgs. - (200 x 10 x 2) kgs = 4,000 kgs.
Maximum stock of B	Re-order level - (Minimum consumption x Minimum delivery period) + Re-order quantity = 4,750 kgs. - (175 x 4 x 3) kgs. + 5,000 kgs. = 9,750 - 2,100 = 7,650 kgs.
Re-order level of C	Maximum delivery period x Maximum usage = 4 x 225 x 6 = 5,400 kgs. or
	= Minimum stock of C + [Average rate of consumption x Average time required to obtain fresh delivery] = 2,000 kgs. + [(200 x 6) x 3] kgs. = 5,600 kgs.
Average stock level of A	= Minimum stock level of A + $^1/2$ Re-order quantity of A = 4,000 kgs. + $^1/2$ x 10,000 kgs. = 4,000 kgs. + 5,000 kgs. = 9,000 kgs. OR,
	Average Stock Level of A $\frac{\text{Minimum Stock level of A + Maximum Stock Levelof A}}{2} = \text{(Refer to working note)}$ $4{,}000 + 16{,}250/2 = 10{,}125$ kgs.

Working note:

Maximum stock level of A= ROL + ROQ - (Minimum consumption x Minimum re-order period)

=8,000 kgs. + 10,000 kgs. - [(175 x 10) x 1] kgs.

=16,250 kgs

Q30. M/s SJBA Private Limited manufactures 20,000 units of a product per month. The cost of placing an order is Rs. 1,500. The purchase price of the raw material is Rs. 100 per kg. The re-order period is 5 to 7 weeks. The consumption of raw materials varies from 200 kg to 300 kg per week, with the average consumption being 250 kg. The carrying cost of inventory is 9.75% per annum. Lead time for emergency purchases is 5 days.

You are required to calculate:

(a) Re-order quantity

(b) Re-order level

(c) Maximum level

(d) Minimum level

(e) Average stock level

(f) Danger level **[Dec 22 - 8 marks]**

Answer:

Re-order quantity or EOQ = $\sqrt{\frac{2AO}{ci}}$	A = 250kg*52 = 13,000 kg O = 1,500 C = 100 I = 9.75% EOQ = (√2*13,000*1,500) / (√9.75) = 2,000 kg
Re-order Level	=Max re-order period x Max consumption 7 weeks* 300 kg = 2100 kg
Maximum Level	=Re-order level + Re-order quantity - (Min re-order period x Min. consumption) = 2100 + 2000 - (5 x 200) =3100kg
Minimum Level	Re-order level - (Avg re-order period* Avg Consumption) = 2100 - (6* 250) = 600 kg
Avg Stock Level	= 1/2 (Max Level + Min level) $^1/_2$(3100+600) = 1850 kg or

	Minimum Level + ½ ROQ = 600+ $^1/_2$ *2000 = 1600 kg
Danger Level	= Average Consumption x Lead time for Emergency Purchases = 250 * 5/7 = 178.57 kg

Q31. M/s KPM Ltd. buys its annual requirement of 80,000 units of a component "Alpha" in 10 instalments. Each unit of 'Alpha' costs Rs.10 and the ordering cost is Rs.25. The inventory carrying cost per annum is estimated at 20% of unit value of 'Alpha'.

You are asked by the KPM Ltd. to find the total annual cost of the existing inventory policy. Also, how much money can be saved by using Economic Order Quantity (EOQ)? **[June 23 - 5 marks]**

Answer:

- Inventory Cost Analysis for M/s KPM Ltd.
- This document provides a detailed analysis of the inventory costs for M/s KPM Ltd. and the potential savings by using the Economic Order Quantity (EOQ) model.

Given Information:

- Annual requirement of component 'Alpha': 80,000 units
- Cost per unit of "Alpha": Rs. 10
- Ordering cost per order: Rs. 25
- Inventory carrying cost per annum: 20% of unit value

Step-by-Step Solution:

Step 1: Calculate the Total Cost of the Existing Inventory Policy

1. Number of instalments/orders per year: 10
2. Number of units per order:
   Annual requirement / Number of instalments 80,000 units / 10 = 8,000 units per order
3. Ordering cost per year:
   Number of orders* Ordering cost per order 10 * Rs. 25 = Rs.250
4. Average inventory: Order quantity/2
   8000/2 = 4,000 units
5. Carrying cost per unit per year: 20% of Rs.10 = Rs. 2
6. Total carrying cost per year:
   Average inventory * Carrying cost per unit 4000 * Rs. 2 = Rs. 8,000
7. Cost of purchasing the units: 80,000 * 10 = Rs. 8,00,000
8. Total cost of the existing policy:
   Cost of purchasing + Ordering cost per year + Total carrying cost per year
   Rs. 8 ,00,000 + Rs. 250 + Rs. 8,000 = **Rs. 8,08,250**

Step 2: Calculate the Total Cost using Economic Order Quantity (EOQ)

1. EOQ formula: $\sqrt{\frac{2AO}{c}}$
2. EOQ calculation:
   EOQ = $\sqrt{\frac{2 \times 80{,}000 \times 25}{2}}$
   EOQ = 1,414.21 units (approximately 1,414 units)
3. Number of orders per year using EOQ:
   Annual requirement / EOQ
   80,000 / 1,414 Rs. 56.57 orders (approximately 57 orders)
4. Ordering cost per year using EOQ:
   Number of orders using EOQ * Ordering cost per order 57 * Rs. 25 = Rs. 1 ,425
5. Average inventory using EOQ:
   EOQ / 2 = 1,414 / 2 **= 707 units**
6. Total carrying cost per year using EOQ:
   Average inventory using EOQ * Carrying cost per unit 707 * Rs. 2 = Rs. 1,414

7. Total cost using EOQ = Cost of purchasing + Ordering cost using EOQ + Total carrying cost using EOQ
   Rs. 8,00,000 + Rs. 1,425 + Rs. 1,414 = Rs. 8,02,839

Step 3: Calculate the Savings

1. Savings by using EOQ: Total cost of existing policy - Total cost using EOQ
   Rs.8,08,250 - Rs.8,02,839 = Rs. 5,411

Conclusion

- The total annual cost of the existing inventory policy is Rs. 8,08,250.
- The total annual cost using EOQ is Rs.8,02,839.
- The savings by using EOQ are approximately Rs. 5,411.
- By using EOQ, M/s KPM Ltd. can save around Rs. 5,411 annually on inventory costs