CHAPTER-2
MATERIAL COSTING

I. VALUATION FOR MATERIAL RECEIPTS

Q1. (SMN1/SMO). An invoice in respect of a consignment of chemicals A and B provides the following information :

	(Rs.)
Chemical A : 10,000 per kgs. at Rs. 10 per kg.	1,00,000
Chemical B : 8,000 kgs. at Rs. 13 per kg.	1,04,000
Central Sales Tax @ 2%	4,080
Railway freight	3,840
Total Cost	2,11,920

A shortage of 500 kgs. in chemical A and 320 kgs. in chemical B is noticed due to normal breakages. You are required to determine the rate per kg. of each chemical , assuming a provision of 2% for further deterioration.

[Change Custom Duty in SMN]

Q2. (SMN2/SMO) At what price per unit would Part No. A 32 be entered in the Stores Ledger, in the following invoice was received from a supplier :

Invoice	Rs.
200 units Part No. A 32 @ Rs. 5	1,000.00
Less : 20 % Discount	200.00
	800.00
Add: Excise Duty @ 15%	120.00
	920.00
Add : Packing charges (5 non-returnable boxes)	50.00
	970.00

Notes :

(i) A 2 per cent discount will be given for payment in 30 days.

(ii) Documents substantiating payment of excise duty is enclosed for claiming CENVAT credit.

[Change Excise Duty in SMN]

II. INVENTORY CONTROL ON THE BASIS OF RELATIVE CLASSIFICATION

(1) ABC ANALYSIS

Q3. (SMN8/SMO). From the following details, draw a plan of ABC selective control :

Item	Units	Unit Cost (Rs.)
1	7,000	5.00
2	24,000	3.00
3	1,500	10.00
4	600	22.00
5	38,000	1.50
6	40,000	0.50
7	60,000	0.20
8	3,000	3.50
9	300	8.00
10	29,000	0.40
11	11,500	7.10
12	4,100	6.20

Q4. (SMN9/C11/SMO) A factory used- 4,000 varieties of inventory. In terms of inventory holding and inventory usage, the following information is complied:

No of varieties of inventory	%	% value of inventory holding (average)	% of Inventory usage (in end product)
3,875	96.875	20	5
110	2.750	30	10
15	0.375	50	85
4,000	100.00	100	100

Required: Classify the items of inventory as per ABC analysis with reasons.

(2) BY SETTING QUANTITATIVE LEVELS
(A) EOQ / ROQ

(i) Formula Method

Q5. **(SMN3/SMO).** (Calculation of EOQ)
Calculate the Economic Order Quantity from the following information. Also state the number of orders to be placed in a year.

Consumption of materials per annum	10,000 kg.
Order placing cost per order	Rs. 50
Cost per kg. of raw material	Rs. 2
Storage costs	8% on average inventory.

Q6. **(SMN4/SMO).** (i)Compute EOQ and the total variable cost for the followings :

Annual Demand	5,000 untis
Unit price	Rs. 20.00
Order cost	Rs. 16.00
Storage rate	2% per annum
Interest Rate	12% per annum
Obsolescence rate	6% per annum

(ii) Determine the total variable cost that would result for the items if an incorrect price of Rs. 12.80 is used.

Q7. **(C10/PM).**A company manufactures a product from a raw material, which is purchased at Rs.60 per kg. The company incurs a handling cost of Rs.360 plus freight of Rs. 390 per order. The incremental carrying cost of inventory of raw material is Re.0.50 per kg per month In addition , the cost of working capital finance on the investment in inventory of raw material is Rs.9 per kg. per annum. The annual production of the product is 1,00,000 units and 2.5 units are obtained from one kg of raw material.

Required:

(i) Calculate the economic order quantity of raw materials.

(ii) Advise, how frequently should orders for procurement be placed.

(i) If the company proposes to rationalise placement of orders on quarterly basis, what percentage of discount in the price of raw materials should be negotiated? **[MTP-OCT 18/1(B)-Similar]**

Q8. **(SMP1/SMO).** Anil & Company buys its annual requirement of 36,000 units in 6 installments. Each unit costs Rs. 1 and the ordering cost is Rs. 25. The inventory carrying cost is estimated at 20% of unit value. Find the total annual cost of the existing inventory policy. How much money can be saved by Economic Order Quantity.

Q9. **(SMP2/SMO).** A company manufactures a special product which requires a component 'Alpha'. The following particulars are collected for the year 2011 :

(i)	Annual demand of Alpha	8,000 units
(ii)	Cost of placing an order	Rs. 200 per order
(iii)	Cost per unit of Alpha	Rs. 400
(iv)	Carrying cost p.a.	20%

The company has been offered a quantity discount of 4% of the purchase of 'Alpha' provide the order size is 4,000 components at a time .

Required :

(i) Compute the economic order quantity.

(ii) Advise whether the quantity discount offer can be accepted.

Q10. **(SMP3/C5/SMO)**The Complete Gardener is deciding on the economic order quantity for two brands of lawn fertilizer:
Super Grow and Nature's Own. The following information is collected:

	Fertilizer	
	Super Grow	**Nature's Own**
Annual Demand	2,000 Bags	1,280 Bags
Relevant ordering cost per purchase order	Rs. 1,200	Rs. 1,400
Annual relevant carrying cost per bag	Rs.480	Rs.560

Required:

(i) Compute EOQ for Super Grow and Nature's Own.

(ii) For the EOQ, what is the sum of the total annual relevant ordering costs and total annual relevant carrying costs for Super Grow and Nature's Own?

(iii) For the EOQ, Compute the number of deliveries per year for Super Grow and Nature's Own.

(November, 1999)

Q11. **(C17/PM).**ZED Company supplies plastic crockery to fast food restaurants in metropolitan city. One of its products is a special bowl, disposable after initial use, for serving soups to its customers. Bowls are sold in pack 10 pieces at a price of Rs. 50 per pack.

The demand for plastic bowl has been forecasted at a fairly steady rate of 40,000 packs every year. The company purchases the bowl direct from manufacturer at Rs. 40 per pack within a three days lead time. The ordering and related cost is Rs. 8 per order. The storage cost is 10% per cent per annum of average inventory investment.

Required:

(i) Calculate Economic Order Quantity.

(ii) Calculate number of orders needed every year.

(iii) Calculate the total cost of ordering and storage bowls for the year.

(iv) Determine when should the next order to be placed (Assuming that the company does maintain a safety stock and that the present inventory level is 333 packs with a year of 360 working days.

[R-N-15/1-Similar]

Q12. **(SMP7/SMO).** G. Ltd. produces a product which has a monthly demand of 4,000 units. The product requires a component X which is purchased at Rs. 20. For every finished product, one unit of component is required. The ordering cost is Rs. 120 per order and the holding cost is 10% p.a.

You are required to calculate :

(i) Economic order quantity.

(ii) If the minimum lot size to be supplied is 4,000 units, what is the extra cost, the company has to incur ?

(iii) What is the minimum carrying cost, the company has to incur ?

Q13. Arnav Ltd. Manufactures a product X which requires two raw materials A and B in a ratio of 1 : 4. The sales department has estimated a demand of 5,00,000 units for the product for the yea. To produce one unit of finished product, 4 units of material A is required.

Stock position at the beginning of the year is as below:

Product-X	12,000 units
Material A	24,000 units
Material B	52,000 units

To place an order the company has to spend Rs. 15,000. The company is financing its working capital using a bank cash credit @ 12% p.a.

Product X is sold at Rs. 1,040 per unit, Material A and B is purchased at Rs. 150 and Rs. 200 respectively.

Required:

Compute economic order quantity (EOQ):

(i) If purchase order for the both materials is placed separately.

(ii) If purchase order for the bothe materials is not placed separately. **[MTP-OCT19/1(C)]**

Q14. Aditya Brothers supplies surgical gloves to nursing homes and polyclinics in the city. These surgical gloves are sold in pack of 10 pairs at price of Rs. 250 per pack.

For the month of April 2018, it has been anticipated that a demand for 60,000 packs of surgical gloves will arise. Aditya Brothers purchases these gloves from the manufacturer at Rs. 228 per pack within a 4 to 6 days lead time. The ordering and related cost is Rs. 240 per order. The storage cost is 10% p.a. of average inventory investment.

Required:

(i) CALCULATE the Economic Order Quantity (EOQ)

(ii) CALCULATE the number of orders needed every year

(iii) CALCULATE the total cost of ordering and storage of the surgical gloves.

(iv) DETERMINE when should the next order to be placed. (Assuming that the company does maintain a safety stock and that the present inventory level is 10,033 packs with a year of 360 working days). **[R-M18/1]**

Q15. Answer the following:

(a) M/s X Private Limited is manufacturing a special product which requires a component "SKY BLUE". The following particulars are available for the year ended 31st March, 2018:

–Annual demand of "SKY BLUE"	12000 units
–Cost of placing an order	Rs. 1,800
–Cost per unit of "SKY BLUE"	Rs. 640
–Carrying cost per annum	18.75%

The company has been offered a quantity discount of 5% on the purchases of "SKY BLUE" provided the order size is 3000 components at a time.

You are required to

(i) Compute the Economic Order Quantity.

(ii) Advise whether the quantity discount offer can be accepted. **[INTER-M18/1(A)][M-5]**

Q16.(PM). Aditya Ltd. produces a product 'Exe' using a raw material Dee. To produce one unit of Exe, 2 kg of Dee is required. As per the sales forecast conducted by the company, it will able to sale 10,000 units of Exe in the coming year. The following is the information regarding the raw material Dee.

(i) The Re-order quantity is 200 kg. less than the Economic Order Quantity (EOQ)

(ii) Maximum consumption per day is 20 kg. more than the average consumption per day.

(iii) There is an opening stock of 1,000 kg.

(iv) Time required to get the raw material from the suppliers is 4 to 8 days.

(v) The purchase price is Rs. 125 per kg.

There is an opening stock of 900 units of the finished product Exe.

The rate of interest charged by bank on Cash Credit facility is 13.76%.

To place an order company has to incur Rs. 720 on paper and documentation work.

From the above information find out the followings in relation to raw material Dee :

(a) Re-order Quantity

(b) Maximum Stock Level

(c) Minimum Stock Level

(d) Calculate the impact on the profitability of the company by not ordering the EOQ.

[Take 364 days for a year]. **[R-M-15/1][R-N-17/1][R-M-19/1]**

(ii) Tabular Method

Q17. (SMP5/A6/SMO).EXE Limited has received an offer of quantity discounts on its order of materials as under:

Price per tonne	Tonnes
Rs	**Nos**
1,200	Less than 500
1,180	500 and less than 1,000
1,160	1,000 and less than 2,000
1,140	2,000 and less than 3,000
1,120	3,000 and above

The annual requirement for the materials is 5,000 tonnes. The ordering cost per order is Rs 1,200 and the stock holding cost is estimated at 20% of material cost per annum.

Required:

(a) Compute the most economical purchase level.

(b) What will be your answer to the question which precedes this if there are no discounts offered and the price per tonne is Rs 1,500?

Q18.(PM). Assume that the following quantity discount schedule for a particular bearing is available to a retail store :

Order Size (unit)	Discount
0 – 49	0%
50 – 99	5%
100 – 199	10%
200 and above	12%

The cost of a single bearing with no discount is Rs. 30. The annual demand is 250 units. Ordering cost is Rs. 20 per order and annual inventory carrying cost is Rs. 4 per unit. Determine the optimal order quantity and the associated minimum cost of inventory and purchasing costs, if shortages are not allowed .

Q19. (C12/PM)IPL Limited uses a small casting in one of its finished products The castings are purchased from a foundry. IPL Limited purchases 54,000 castings per year at a cost of Rs.800 per casting. The castings are used evenly throughout the year in the production process on a 360-day-per-year basis. The company estimates that it costs Rs.9,000 to place a single purchase order and about Rs.300 to carry one casting in inventory for a year. The high carrying costs result from the need to keep the castings in carefully controlled temperature and humidity conditions, and from the high cost of insurance.

Delivery from the foundry generally takes 6 days, but it can take as much as 10 days. The days of delivery time and percentage of their occurrence are shown in the following tabulation:

Delivery time (days)	6	7	8	9	10
Percentage of occurrence	75	10	5	5	5

Required:

(i) Compute the economic order quantity(EOQ).

(ii) Assume the company is willing to assume a 15% risk of being out of stock. What would be the safety stock and the re-order point?

(iii) Assume the company is willing to assume a 5% risk of being out of stock. What would be the safety stock and the re-order point?

(iv) Assume 5% stock-out risk. What would be the total cost of ordering and carrying inventory for one year?

(v) Refer to the original data. Assume the using process re-engineering the company reduces its cost of placing a purchase order to only Rs.600. In addition company estimates that when the waste and inefficiency caused by inventories are considered, the true cost of carrying unit in stock is Rs.720 per year.

(a) Compute the new EOQ

(b) How frequently would the company be placing an order, as compared to the old purchasing policy. **(May, 2004)**

(B) STOCK LEVELS

Q20.(SMN5/SMO). Two components , A and B are used as follows :

Normal usage	50 per week each
Maximum usage	75 per week each
Minimum usage	25 per week each
Re-order quantity	A : 300; B : 500
Re-order period	A : 4 to 6 weeks
	B : 2 to 4 weeks

Calculate for each component (a) Re-ordering level, (b) Minimum level, (c) Maximum level , (d) Average stock level.

Q21. (SMN6/SMP6). From the details given below, calculate :

(i) Re-ordering level
(ii) Maximum level
(iii) Minimum level
(iv) Danger level

Re-ordering quantity is to be calculated on the basis of following information :
Cost of placing a purchase order is Rs. 20
Number of units to be purchase during the year is 5,000.
Purchase price per unit inclusive of transportation cost is Rs. 50.
Annual cost of Storage per units is Rs. 5.

Detail of lead time	:	Average – 10 days, Maximum – 15 days , Minimum – 6 days.
		For emergency purchases – 4 days.
Rate of consumption	:	Average : 15 units per day,
		Maximum : 20 units per day.

Q22.(PM). Following details are related to a manufacturing concern :

Re-order Level	16,000 units
Economic Order Quality	90,000
Minimum Stock Level	1,00,000 units
Maximum Stock Level	1,90,000 units
Average Lead Time	6 days
Difference between minimum lead time and Maximum lead time	4 days.

Calculate :

(i) Maximum consumption per day.
(ii) Minimum consumption per day.

Q23. (SMP4/A13/SMO).A company uses three raw materials A, B and C for a particular product for which the following data apply:

Raw Material	Usage per Unit of product (kgs)	Re-Order Quantity (kgs)	Price Per kg	Minimum	Delivery period (in weeks) Average	Maximum	Re-order level (kgs)	Minimum level (kgs)
A	10	10,000	0.10	1	2	3	8,000	?
B	4	5,000	0.30	3	4	5	4,750	?
C	6	10,000	0.15	2	3	4	?	2,000

Weekly production varies from 175 to 225 units, averaging 200 units of the said product. What would be the following quantities: (I) Minimum stock of A? (ii) Maximum stock of B? (iii) Re-order level C? (iv) Average stock level of A?

Q24. A Ltd. produces a product 'Exe' using a raw material Dee. To produce one unit of Exe, 2 kg of Dee is required. As per the sales forecast conducted by the company, it will able to sale 10,000 units of Exe in the coming year. The following is the information regarding the raw material Dee:

(i) The Re-order quantity is 200 kg. less than the Economic Order Quantity (EOQ).

(ii) Maximum consumption per day is 20 kg. more than the average consumption per day.

(iii) There is an opening stock of 1,000 kg.

(iv) Time required to get the raw materials from the suppliers is 4 to 8 days.

(v) The purchase price is Rs.125 per kg.

There is an opening stock of 900 units of the finished product Exe. The rate of interest charged by bank on Cash Credit facility is 13.76%.

To place an order company has to incur Rs.720 on paper and documentation work. From the above information, COMPUTE the followings in relation to raw material Dee:

(i) Re-order Quantity

(ii) Maximum Stock level

(iii) Minimum Stock level

(iv) The impact on the profitability of the company by not ordering the EOQ. [Take 364 days for a year] **[MTP2-M18/2(A), MTP-APR-19/5(B)-Similar]**

3. VALUATION OF MATERIAL ISSUE

Q25. (SMN12/SM). The following transactions in respect of material Y occurred during the six months ended 30th June, 2011 :

Month	Purchase (units)	Price per unit (Rs.)	Issued units
January	200	25	Nil
February	300	24	250
March	425	26	300
April	475	23	550
May	500	25	800
June	600	20	400

Required :

(a) The Chief Accountant argues that the value of closing stock remains the same no matter which method of pricing of material issues is used. Do you agree ? Why or why not ? Detailed stores ledgers are not required.

(b) When and why would you recommend the LIFO method of pricing material issues ?

Q26.(SMN13/SMO). The following information is provided by Sunrise Industries for the fortnight of April, 2011 :

Material Exe :

Stock on 1-4-2011 100 units at Rs. 5 per unit

Purchases

5-4-11	300 units at Rs. 6
8-4-11	500 units at Rs. 7
12-4-11	600 units at Rs. 8

Issues

6-4-11	250 units
10-4-11	400 units
14-4-11	500 units.

Required :

(A) Calculate using FIFO and LIFO methods of pricing issues :

(a) The value of materials consumed during the period

(b) The value of stock of materials on 15-4-11.

(B) Explain why the figures in (a) and (b) in part A of this question are different under the two methods of pricing of material issues used. You need not draw up the Stores Ledgers.

Q27.(SMP8/SMO). 'AT' Ltd. furnishes the following store transactions for September, 2011 :

1-9-11	Opening Balance	25units value Rs. 162,50
4-9-11	Issues Req. No. 85	8 units
6-9-11	Receipts from B & Co. GRN No.26	50 units @ Rs. 5.75 per unit
7-9-11	Issues Req. No. 97	12 units
10-9-11	Return to B & Co.	10 units
12-9-11	Issues Req. No. 108	15 units
13-9-11	Issue Req. No. 110	20 units
15-9-11	Receipts from M & Co. GRN. No. 33	25 units @ Rs. 6.10 per unit
17-9-11	Issues Req. No. 121	10 units
19-9-11	Received replacement from B & co. GRN No. 38	10 units
20-9-11	Returned from Department, material of M & Co. MRR No. 4	5 units
22-9-11	Transfer from Job 182 to Job 187 in the dept. MTR 6	5 units
26-9-11	Issues Req. No. 146	10 units
29-9-11	Transfer from Dept. "A" to Dept. "B" MTR 10	5 units
30-9-11	Shortage in Stock Taking	2 units

Write up the priced stores ledger on FIFO method and discuss how would you treat the shortage in stock taking.

Q28. **(SMP9/SMO).**The following information is extracted from the Stores Ledger :

Material X	
Opening Stock	Nil
Purchases :	
Jan. 1	100 @ Rs. 1 per unit
Jan. 20	100 @ 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 First-In-First-Out, Last-in-First-Out and the Weighted Average Method. Tabulate the values allocated to Job W 16, Job W 17 and the closing stock under the methods aforesaid and discuss from different points of view which method you would prefer.

4. INVENTORY TURNOVER RATIO

Q29. **(SMN10/C9/SMO).**The following data are available in respect of material X for the year ended 31st March 2007.
Opening stock Rs.90,000,
Purchases during the year Rs.2,70,000,
Closing Stock Rs.1,1 0,000.
Calculate:

(i) Inventory turnover ratio; and
(ii) the number of days for which the average inventory is held. (Nov, 1997)

Q30. **(SMN11/A14).**From the following data for the year ended 31st March 20X2, 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 at 01.04.20X1	10,000	9,000
Purchases during the year	52,000	27,000
Closing Stock as at 31.03.20X2	6,000	11,000

Q31. The following details are provided by M/s SKU Enterprises for the year ended 31 March, 2018:

Particulars	Material – M (Rs.)	Material – N (Rs.)
Stock as on 01-04-2017	6,00,000	10,00,000
Stock as on 31-03-2018	4,50,000	7,25,000
Purchases during the year	9,50,000	18,40,000

You are required to :

(i) Calculate Turnover Ratio of both the materials.
(ii) Advise which of the two materials is fast moving.

- (Assume 360 days in a year.) **[INTER-M18/5(A)(i)][M-5]**

Q32. **(SMN7/SMO).** M/s Tyro tubes trades in four wheeler tyres and tubes. It stocks sufficient quantity of tyres of almost every vehicle. In year end 2011-12, the report of sales manager revealed that M/s Tyrotubes experienced stock-out of tyres.
The stock-out data is as follows :

*Stock-out of Tyres	No. of times
100	2
80	5
50	10
20	20
10	30
0	33

M/s Tyrotubes loses Rs. 150 per unit due to stock-out and spends Rs. 50 per unit on carrying of inventory.
Determine optimum safest stock level.
*Demand that could not be fulfilled due to insufficient stock of tyres.

Solution:

Computation of Stock – out and inventory carrying cost

Safety Stock Level (units) (1)	Stock-out (units) (2)	Probability (3)	Stock-out cost(Rs.) (4)=(2)×Rs 150	Expected stock-out cost(Rs.)(5)=(3)×(4)	Inventory carrying cost (RS.) (6)=(1)×Rs. 50	Total cost (Rs.) (7)=(5)+(6)
100	0	0.00	0	0	5,000	5,000
80	20	0.02	3,000	60	4,000	4,060
50	50	0.02	7,500	150		
	30	0.05	4,500	225		
			12,000	375	2,500	2,875
20	80	0.02	12,000	240		
	60	0.05	9,000	450		
	30	0.10	4,500	450		
			25,500	1,140	1,000	2,140
10	90	0.02	13,500	270		
	70	0.05	10,500	525		
	40	0.10	6,000	600		
	10	0.20	1,500	300		
			31,500	1,695	500	2,195
0	100	0.02	15,000	300		2,700
	80	0.05	12,000	600		
	50	0.10	7,500	750		
	20	0.20	3,000	600		
	10	0.30	1,500	450		
			39,000	2,700	0	2,700

At safety stock level of 20 units, total cost is least i.e. Rs. 2,140.

Working note:

Computation of Probability of Stock-out

Stock-out (units)	100	80	50	20	10	0	Total
Nos. of times	2	5	10	20	30	33	100
Probability	0.02	0.05	0.10	0.20	0.30	0.33	1.00

Explanation:

Stock-out means the demand of an item that could not be fulfilled because of insufficient stock level.

Safety stock is the level of stock of any item which is maintained in excess of lead time consumption. It is kept as cushion against any unexpected demand for that item.

Safety stock level	Impact
100 units	Any unexpected demand upto 100 units can be met
80 units	Stock out will only arise if unexpected demand will be for 100 units. In this case 20 units will remain unsatisfied. The probability of any unexpected demand for 100 units is 0.02.
50 units	Any unexpected demand beyond 50 units will be remain unsatisfied. If unexpected demand for 100 units arises (probability is 0.02) 50 units will be unsatisfied. Similarly if unexpected demand for 80 units arises (probability is 0.05), 30 units will be unsatisfied.
20 units	Any unexpected demand beyond 20 units will be remain unsatisfied. If unexpected demand for 100 units arises (probability is 0.02), 80 units will remain unsatisfied. If unexpected demand for 80 units arises (probability is 0.05), 60 units will remain unsatisfied. Similarly, when unexpected demand for 50 units arises (probability is 0.10), 30 units will remain unsatisfied.
10 units	Any unexpected demand beyond 10 units will be remain unsatisfied. If unexpected demand for 100 units arises (probability is 0.02). 90 units will remain unsatisfied. If unexpected demand for 80 units arises (probability is 0.05), 70 units will remain unsatisfied. If unexpected demand for 50 units arises (probability is 0.10), 40 units will

	remain unsatisfied. Similarly, when unexpected demand for 20 units arises (probability is 0.20), 10 units will remain unsatisfied.
0 unit	When no safety stock level is maintained, any unexpected demand cannot be satisfied. It unexpected demand for 100 units arises (probability is 0.02), 100 units will remain unsatisfied. If unexpected demand for 80 units arises (probability is 0.05), 80 units arises (probability is 0.05), 80 units will remain unsatisfied. If unexpected demand for 50 units will remain unsatisfied. If unexpected demand for 80 units arises 50 units arises (probability is 0.10), 50 units arises (probability is 0.10), 50 units will remain unsatisfied. If unexpected demand for 20 units arises (probability is 0.20), 20 units will remain unsatisfied. Similarly, unexpected demand for 10 units (probability is 0.30), 10 units will remain unsatisfied.

ADDITIONAL QUESTIONS FOR PRACTICE

Q33. **(C6/PM).**A company has the Option to produce a particular material from two sources:
Source I assures that defectives will not be more than 2% of supplied quantity.
Source II does not give any assurance, but on the basis of past experience of supplies received from it, it is observed that defective percentage is 2.8%.
The material is supplied in lots of 1,000 units. Source II supplies the lot at a price, which is lower by Rs 100 as compared to Source I. The defective units of material can be rectified for use at a cost of Rs.5 per unit
You are required to find out which of the following sources is more economical. **(May , 2001)**

Q34. **(C21N).** X Ltd. is reviewing its stock policy, and has the following alternatives available for the evaluation of stock:

(i) Purchase stock twice in a month, 400 units.
(ii) Purchase monthly , 800 units.
(iii) Purchase every three months , 2,400 units
(iv) Purchase six monthly , 4,800 units.
(v) Purchase annually, 9,600 units.

It is ascertained that the purchase per unit is Rs. 40 for deliveries upto 2,000 units. A 5% discount is offered by the supplier on the whole order where deliveries are 2,001 to 4,000 Units and 10% reduction on the total order for deliveries in excess of 4,000 units. Each purchase order incurs administration costs of Rs. 250. Interest on capital and other storage costs are Rs. 12.50 per unit of average stock quantity held.
Calculate the optimum order size. **[June 2009]**

Q35. Arnav Udyog, a small scale manufacturer, produces a product X by using two raw materials A and B in the ratio of 3:2. Material A is perishable in nature and if not used within 5 days of purchase it becomes obsolete. Material B is durable in nature and can be used even after one year. The company has estimated a sales volume of 30,000 kg. for the month of July 2016 and expects that the trend will continue for the entire year. The ratio of input and output is 5:3. The purchase price of per kilogram of raw material A and B is Rs.15 and Rs.22 respectively exclusive of taxes. Material A can be purchased from the local market within 1 to 2 days period. On the other hand Material B is purchased from neighboring state and it takes 2 to 4 days to receive the material in the store.
To place an order the company has to incur an administrative cost of Rs.120. Carrying cost for Material A and B is 15% and 5% respectively.
At present Material A is purchased in a lot of 8,000 kg. to avail 10% discount on market price.
VAT applicable for material A is 4% (credit available) and CST on Material B is 2% (credit not available).
Company works for 25 days in a month and production is carried out evenly.
You are required to calculate:

(i) Economic Order Quantity (EOQ) for each material;
(ii) Maximum stock level for Material A;
(iii) Calculate saving/ loss in Material A if purchase quantity equals to EOQ. **(R-N-16/1)**

Q36. Aditya Ltd. has a monthly requirement for an item of raw material is 1,000 units. The purchase price per unit of material is Rs.60. The cost of processing an order is Rs.540 and the carrying cost is 20%. There is a single supplier for the material which offers quantity discounts as under:

Order Quantity (in units)	Price per unit (Rs.)
Less than 2,000 units	60.00
2,000 units and less than 4,000 units	59.80
4,000 units and less than 6,000 units	59.50
6,000 units and less than 8,000 units	58.90
8,000 units and above	58.40

The company uses the cash credit facility provided by the company's banker to finance its raw material purchase. The bank due to its own infrastructural constraint, can accommodate a maximum of five fund transfer (NEFT/ RTGS) requests for any single beneficiary per annum. The company in short term is unable to arrange any other source of finance.

Required:

(i) Calculate the optimum purchase order size for the company;

(ii) Calculate the order level where the company could have minimised its total cost;

(iii) The amount of loss that the company has to bear due to bank's inability to process fund transfer requests. **(R-M-17/1)**

Q37. Aditya Ltd. has a monthly requirement for an item of raw material is 1,000 units. The purchase price per unit of material is Rs.60. The cost of processing an order is Rs.540 and the carrying cost is 20%. There is a single supplier for the material which offers quantity discounts as under:

Order Quantity (in units)	Price per unit (Rs.)
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8,000 units and above	58.40

The company uses the cash credit facility provided by the company's banker to finance its raw material purchase. The bank due to its own infrastructural constraint, can accommodate a maximum of five fund transfer (NEFT/ RTGS) requests for any single beneficiary per annum. The company in short term is unable to arrange any other source of finance.

Required:

(i) Calculate the optimum purchase order size for the company;

(ii) Calculate the order level where the company could have minimised its total cost;

(iii) The amount of loss that the company has to bear due to bank's inability to process fund transfer requests. **(R-M-17/1)**

Q38. **(C8/PM).**The quarterly production of a company's product which has a steady market is 20,000 units. Each unit of a product requires 0.5 Kg. of raw material. The cost of placing one order for raw material is Rs.100 and the inventory carrying cost is Rs 2 per annum. The lead time for procurement of raw material is 36 days and a safety stock of 1,000 kg. of raw materials is maintained by the company. The company has been able to negotiate the following discount structure with the raw material supplier.

Order quantity Kgs.	Discount Rs.
Upto 6,000	NIL
6,000 — 8,000	400
8,000 — 16,000	2,000
16,000 — 30,000	3,200
30,000 — 45,000	4,000

You are required to:

(i) Calculate the re-order point taking 30 days in a month.

(ii) Prepare a statement showing the total cost of procurement and storage of raw material after considering the discount of the company elects to place one, two, four or six order in the year,

(iii) State the number of orders which the company should place to minimize the costs after taking EOQ also into consideration **(May, 2002)**

Q39. Steel Heart Pvt. Ltd. Manufactures TMT bars from MS Ingots and MS Billets. After production of TMT bars, sorting is carried out to find any defects or units that do not match with standard specification. The products which do not match with the standard product specification are treated as scrap. You are required to state the treatment of the products which do not match with the product specifications in Cost Accounts. **[R-M-15/10]**

Answer: Scrap has been defined as the incidental residue from certain types of manufacture, usually of small amount and low value, recoverable without further processing.

Scrap may be treated in cost accounts in the following ways:-

(i) When the scrap value is negligible: It may be excluded from costs. In other words, the cost of scrap is borne by good units and income from scrap is treated as other income.

(ii) When the scrap value is not identifiable to a particular process or job: The sales value of scrap net of selling and distribution cost, is deducted from overhead to reduce the overhead rate. A variation of this method is to deduct the net realisable value from material cost.

(iii) When scrap is identifiable with a particular job or process and its value is significant: The scrap account should be charged with full cost. The credit is given to the job or process concerned. The profit or loss in the scrap account, on realisation, will be transferred to the Costing Profit and Loss Account.

Q40.(PM). Prepare a Store Ledger Account from the following transactions of XY Company Ltd.

April, 2014	Particulars
April 1	Opening balance 200 units @ Rs. 10 per unit
April 5	Receipt 250 units costing Rs. 2,000
April 8	Receipt 150 units costing Rs. 1,275
April 10	Issue 100 units
April 15	Receipt 50 units costing Rs. 500
April 20	Shortage 10 units
April 21	Receipt 60 units costing Rs. 540
April 22	Issue 400 units

The issues upto 10-4-14 will be prices at LIFO and from 11-04-14 issues will be priced at FIFO. Shortage will be charged as overhead.

Q41. (PM). The following are the details of receipts and issues of a material of stores in a manufacturing company for the period of three months ending 30th June, 2014 :

Receipts :

Date	Quantity (kg.)	Rate per kg. (Rs.)
April 10	1,600	5.00
April 20	2,400	4.90
May 5	1,000	5.10
May 17	1,100	5.20
May 25	800	5.25
June 11	900	5.40
June 24	1,400	5.50

There was 1,500 kg. in stock at April 1, 2014 which was valued at Rs. 4.80 per kg.

Issues :

Date	Quantity (kg.)
April 4	1,100
April 24	1,600
May 10	1,500
May 26	1,700
June 15	1,500
June 21	1,200

Issues are to be priced on the basis of weighted average method.

The stock verifier of the company reported a shortage of 80 kgs on 31st May, 2014 and 60 kgs. On 30th June, 2014. The shortage is treated as inflating the price of remaining material on account of shortage.

You are required to prepare a Stores Ledger Account.

Q42.(PM). Aditya Ltd. is engaged in heavy engineering works on the basis of job order received from industrial customers. The company has received a job order of making turbine from a power generating company. Below are some details of stores receipts and issues of copper wire, used in the manufacturing of turbine :

Feb. 1 Opening stock of 1,200 kgs. @ Rs. 475 per kg.
Feb. 5 Issued 975 kgs. Of mechanical division vide material requisition no. Mec 09/13
Feb. 6 Received 3,500 kgs @ Rs. 460 per kg vide purchase order no. 159/2013
Feb. 7 Issued 2,400 kgs. to electricial division vide material requisition no. Ele 012/13
Feb. 9 Returned to stores 475 kgs. by electrical division against material requisition no. Ele 012/13.
Feb. 15 Received 1,800 kgs. @ Rs. 480 per kg. vide purchase order no. 161/2013
Feb. 17 Returned to supplier 140 kgs. out of quantity received vide purchase order no. 161/2013.
Feb. 20 Issued 1,900 kgs. to electrical division vide material requisition no. Ele 165/2013.

On 28th February, 2014 it was found that 180 kgs. Of wire was fraudulently misappropriated by the stores assistant and never recovered by the company.

From the above information you are required to prepare the Stock Ledger account using 'Weighted Average' method of valuing the issues.

Q43. **[IMP.]** The following details apply to an annual budget for a manufacturing company:

Quarter	1st	2nd	3rd	4th
Working days	65	60	55	60
Production (units per working day)	100	110	120	105
Raw material purchases (%by weight of annual total)	30%	50%	20%	---
Budgeted purchases price (per kg.)	Re. 1	Rs. 1.05	Rs. 1.125	---

Quantity of raw materials per unit of production : 2 kg.
Budgeted opening stock of raw materials 4,000 kg. (cost Rs. 4,000)
Budgeted closing stock of raw materials 2,000 kg.
Issues are priced on FIFO basis.
Calculate the following budget figures:

(a) Quarterly and annual purchases of raw material, by weight and value.
(b) Closing quarterly stock by weight and value. **[R-M-10/3]**

Q44. **[V.IMP]** Aditya Agro Ltd. produces edible oils of different varieties. The monthly demand pattern for the finished products are as follows:

Mustard oil	45,000 Litre
Soybean oil	15,000 Litre
Olive oil	3,000 Litre

To produce one litre of Mustard oil, Soybean oil and Olive oil, 5 kg. of mustards, 6 kg. of soybeans and 4.5 kg. of olives are required respectively. There is no opening and closing stock of materials.

Aditya Agro Ltd. can purchase the materials either from the farmers directly or from the wholesale market. The company can purchase any quantity of materials from the wholesale market but in case of purchase from the farmers, it has to purchase the minimum specified quantity of materials at a time. Following is the material-wise summary related with the purchase of materials:

	Wholesale Market	Farmers
Mustard:		
Minimum Quantity to be purchased	Any quantity	13,50,000 kg.
Purchase price per kg. (Rs.)	15.00	12.50
Central Sales Tax (CST)*	2%	—
Transportation cost per purchase (Rs.)	6,000	15,000
Sorting and piling cost per purchase (Rs.)	—	1,200
Loading cost per 50 kg. (Rs.)	10.00	5.00
Unloading cost per 50 kg. (Rs.)	2.00	2.00
Soybean:		
Minimum Quantity to be purchased	Any Quantity	2,70,000 kg.
Purchase price per kg. (Rs.)	11.00	9.00
Value Added Tax (VAT)**	4%	—
Transportation cost per purchase (Rs.)	9,000	12,000
Sorting and piling cost per purchase (Rs.)	—	800
Loading cost per 50 kg. (Rs.)	10.00	3.00
Unloading cost per 50 kg. (Rs.)	2.00	2.00
Olive:		
Minimum Quantity to be purchased	Any Quantity	1,62,000 kg.
Purchase price per kg. (Rs.)	36.00	28.00
Import duty***	---	10%
Transportation Cost per purchase (Rs.)	3,000	11,000
Sorting and piling cost per purchase (Rs.)	1,800	---
Loading cost per 50 kg. (Rs.)	10.00	25.00
Unloading cost per 50 kg. (Rs.)	2.00	2.00

The company is paying 12.5% p.a. as interest to its bank for cash credit facility and 100 per 100 kg. as rent to the warehouse.

[*CST will be added with the purchase price of mustards, **VAT will not be added with the purchase price of soybeans; **Import duty will be added with the purchase price of olive.]

You are required to

(i) Calculate the purchase cost of each material
  (a) from Wholesale market
  (b) from the Farmers

(ii) Calculate Economic Order Quantity of each material under the both options.

(iii) Recommend the best purchase option for the material 'olive'. **[R-N-14/1]**

Q45. **(A16)**From the following invoice received from a supplier, calculate the material cost per unit:

Quantity	Particulars	Amount Rs.	Rate Rs.
150 kgs	Material X	20.00 per kg	3,000
100 kgs	Material Y	24.00 per kg	2,400
			5,400
	Less Trade discount		180
Add:			5,220
Cost of containers (capacity of each 25 kgs)			120
Cartage and carriage			150
Octroi duty @ 1%			54
			5,544

Terms :

(i) 5% cash discount for payment within a week.

(ii) Return value of containers Rs.9 each.

Q46. **(A17).**The particulars relating to 1200 Kg of a certain raw material purchased by Krishna sales corporation Ltd. During March were as follows:

(a) Lot prices quoted by supplier and accepted by the company for placing the purchase order:
Lot upto 1000 kgs @ 22 per kg
Between 1001—1500 kgs @ Rs 20 per kg.
Between 1501—2000 kg @ Rs 18 per kg.

(b) Trade discount 20%

(c) Additional charges for containers Rs. 10 per drum of 25 kg.

(d) Credit allowed on return of containers Rs. 8 per drum.

(e) Value Added Tax at 10% on raw material and 5% on drums.

(f) Total freight paid by the purchaser Rs. 219.40

(g) Insurance at 2.5% (on Net Invoice Value) paid by the purchaser.

(h) Stores overhead applied at 5% on total purchase cost of material (excluding stores overheads).

(i) Normal Loss 5% and Abnormal Loss 140 kg.

(j) Scrap value of loss Rs. 5 per kg.

(k) Units issued to production 600 kgs.

The containers are returned in due course. Draw up suitable statements to show:

(i) Total cost of material purchased

(ii) Unit cost of material issued to production

(iii) Total cost of material issued to production

(iv) Total cost of material in hand

(v) Total cost of abnormal loss.

Q47. **(A18).**A manufacturer of Surat purchased three chemicals A, B and C from Mumbai. 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	,000
Total Cost	**44,155**

A shortage of 200 kg in Chemical A, of 280 kg in Chemical B and of 100 kg Chemical C was noticed due to normal breakages. At Surat, the manufacturer paid Octroi duty Re 0.10 per kg. He also paid cartage 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 issue of chemicals assuming a provision of 5% towards further deterioration.

Q48. **(A19).**At what price per unit would Part No. A 32 be entered in the stores ledger, if the following invoice was received from a supplier?

	Rs.
Invoice	1,000
200 units Part No. A 32 @ Rs. 5	200
Less : 20% discount	800
	120
Add: Excise duty @ 15%	920
	50
Add : Packing charges (5 non-returnable taxes)	970

Notes:

(i) A 2 per cent discount will be given for payment in 30 days.

(ii) Documents substantiating payment of excise duty is enclosed for claiming MODVAT credit.

Q49. **[V.IMP]** - The following information has been extracted from the records of a cotton merchant, for the month of March, 2013:

Sales for the month: Rs. 62,00,000

Opening Stock as on 01.03.2013: 22,000kgs @Rs.58.50.

Purchases made during the month

Date	Quantity (kgs.)	Rate (Rs.)
03.03.2013	35,000	59.00
18.03.2013	32,000	59.50
25.03.2013	22,000	60.00

(on all the purchases, freight is paid @Rs.1.75 per kgs)

Closing stock as on 31.03.2013: 23,000kgs

Salary paid to accounting Rs.11,000.

From the above information you are required to calculate the following:

(i) Value of closing stock as on 31.03.2013 (using First in first Out (FIFO) method)

(ii) Cost of goods sold during March, 2013 and

(iii) Profit for the month of March, 2013. **[R-M-13/1]**

Q50. The following are the details of receipt and issue of material 'CXE' in a manufacturing Co. during the month of April 2019 :

Date	Particulars	Quantity (kg)	Rate per kg
April 4	Purchase	3000	Rs. 16
April 8	Issue	1000	
April 15	Purchase	1500	Rs. 18
April 20	Issue	1200	
April 25	Return to supplier out of purchase made on April 15	300	
April 26	Issue	1000	
April 28	Purchase	500	Rs. 17

Opening Stock as on 01-04-2019 is 1000 kg @ Rs. 15 per kg.

On 30th April, 2019 it was found that 50 kg of material 'CXE' was fraudently misappropriated by the store assistant and never recovered by the Company.

Required:

(i) Prepare a store ledger account under each of the following method of pricing the issue :
   (a) Weighted Average Method
   (b) LIFO

(ii) What would be the value of material consumed and value of closing stock as on 30-04-2019 as per those two methods ? **[INTER/M19/4(B)]**

Q51. HBL Limited production 'M' which has a quarterly demand of 20,000 units. Each product requires 3 kg. and 4 kg. of material X and Y respectively. Material X is supplied by a local supplier and can be produced at factory stores at any time, hence, no need to keep inventory for material X. The material Y is not locally available, it requires to be purchased from other states in a specially designed truck container with a capacity of 10 tons.

The cost and other information related with the materials are as follows :

Particulars	Material – X	Material – y
Purchase price per kg. (excluding GST)	Rs. 140	Rs. 640
Rate of GST	18%	18%
Freight per trip (fixed, irrespective of quantity)	-	Rs. 28,000
Loss of materials in transit*	-	2%
Loss in process*	4%	5%

*On purchased quantity

Other information :

- The company has to pay 15% p.a. to bank for cash credit facility.
- Input credit is available on GST paid on materials.

Required ;

(i) CALCULATE cost per kg. of material X and Y.

(ii) CALCULATE the Economic Order Quantity for both for the material. **[R-N19/1]**

Q52. A store keeper has prepared the below list of items kept in the store of the factory .

Item	Units	Unit cost(Rs.)
A	12,000	30.00
B	18,000	3.00
C	6,000	35.00
D	750	220.00
E	3,800	75.00
F	400	105.000
G	600	300.00
H	300	250.00
I	3,000	250.00
J	20,000	7.50
K	11,500	27.50
L	2,100	75.00

The store keeper requires your help to classify the items for prioritization. You are required to Apply ABC analysis to classify the store items as follows:
Store items which constitutes approx 70%, 20% and 10% of total value as A, B and C respectively.

[MTP-MAR-18/2(A)]

Q53. ACE Ltd. produces a products EMM using a material 'REX'. To produce one unit of EMM 0.80 kg of 'REX' is required. As per the sales forecast conducted by the company it will able to sell 45600 units of products EMM in the coming year. There is an opening stock of 3150 units of product EMM and company desires to maintain closing stock equal to one month's forecasted sale. Following is the information regarding material 'REX' :

(i)	Purchase price per kg	Rs. 25
(ii)	Cost of placing order	Rs.240 per order
(iii)	Storage cost	2% per annum
(iv)	Interest rate	10% per annum
(v)	Average lead time	8 days
(vi)	Difference between minimum and maximum lead time	6 days
(vii)	Maximum usage	150 kg
(viii)	Minimum usage	90 kg

Opening stock of material 'REX' is 2100 kg and closing stock will be 10% more than opening stock.

Required :

(i) Compute the EOQ and total cost as per EOQ.
(ii) Compute the reorder level and maximum level.
(iii) If the company places an order of 7500 kg of REX at a time, it gets 2% discount, should the offer be accepted ?

[IPC/M19/2(A)]

Q54. ASJ manufacturer produces which requires a component costing Rs. 1,000 per unit. Other information related to the component are as under :

Usage of component	1,500 units per month
Ordering cost	Rs. 75 per order
Storage cost rate	2% per annum
Obsolescence rate	1% per annum
Maximum usage	400 units per week
Lead Time	6 – 8 weeks

The firm has been offered a quantity discount of 5% by the supplier on the purchase of component, if the order size is 6,000 units at a time.

You are required to compute :

(i) Economic Order Quantity (EOQ)
(ii) Re –order Level and advise whether the discount offer be accepted by the firm or not.

[IPC/M18/1(A)]

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Home work