Ex/Met/HS/B/T/424/2024

Bachelor of Metallurgical and Materials Engineering Examination, 2024

(4th Year, 2nd Semester)

Industrial Management & Engineering Economics

Time: Three Hours | Full Marks: 100

Answer any five questions (only first five answered questions shall be examined)

1. Which factors are considered for classification of production systems? Explain 'Process Production'. Describe objectives of MRP. Explain major inputs of MRP.. Illustrate and explain 'fixed position layout'. **2 + 5 + 3 + 5 + 5**

2. What do you understand by the word 'Management'? Describe scope of management. With the help of a graphical presentation describe MBO. Explain functions of top-level management. **2 + 6 + 7 + 5**

3. Make initial allocation of the following transportation problem by north-west corner rule, then optimise the total transportation cost by applying stepping stone method:: **5 + 15**

Transportation Costs per Unit of Sigma Induction Cooker

From \ To	Dhulian	Englishbazar	Falta	Total Supply (No. of Units)
Andul	Rs. 8	Rs. 6	Rs. 7	200
Bangaon	Rs. 6	Rs. 7	Rs. 9	300
Chandannagar	Rs. 7	Rs. 8	Rs. 8	340
Total Demand (No. of Units)	240	360	240	

4. **(a)** Derive EOQ with appropriate diagram and notations. What are its assumptions? **7 + 3**

(b) Piyasa is a manufacturer of canned soft drinks. Its daily consumption of empty cans is 1,000 pieces per day over 260 business days a year. The procurement cost per piece of the cans is Rs. 5. The ordering cost for this item has been estimated at Rs. 100 per order. The carrying cost is 20% of the procurement cost per year. It takes 5 business days for the company to receive empty cans from the vendor. No quantity discounts are available, and also no stock outs are to be tolerated. How many pieces of cans should Piyasa order at a time? How much is the re-order point? What is the cycle time? Compute the total annual variable cost. **3 + 2 + 2 + 3**

5. Make journal entries ledger entries, and finally prepare respective month-end trial balance from following transactions of Mahalakshmi Metals:

   (i) On 02 /01/ 24, Priyanka invested Rs. 60 lakh for opening her own metal organisation called 'Mahalakshmi Metals'.
   (ii) On 10 /01 / 24, Mahalakshmi Metals purchased Building & Equipment of Rs. 50 lakh in cash.
   (iii) On 22 / 01 / 24, purchased inventories of Rs. 20 Lakh on credit.
   (iv) On 31 / 01 / 24, sold goods of Rs 25 lakh on credit. **4 + 12 + 4**

6. From the following trial balance extracted from the books of Mahakal Traders as on 31.03.24. Prepare **(i)** a Trading A/c, **(ii)** a Profit & Loss A/c, and **(iii)** an year-end Balance Sheet. **6 + 8 + 6**

[Turn over

Trial Balance of Mahakal Trader as on 31.03.24

Debit Balances	Rs.	Credit Balances	Rs.
Cash in hand	2,000	Capital	2,00,000
Machinery	60,000	Sales	2,54,800
Stock (on 01.04.23)	50,000	Sundry Creditors	40,000
Bills receivable	1,600	Bank overdraft	22,000
Sundry debtors	50,000	Return outwards	3,000
Wages	70,000	Discount received	1,800
Land	40,000	Bills payable	1,800
Carriage inwards	2,400		
Purchases	1,80,000		
Salaries	24,000		
Rent	4,000		
Postage	1,000		
Return inwards	3,200		
Drawings	10,000		
Furniture	18,000		
Interest	600		
Cash at bank	6,600		
	5,23,400		5,23,400

Stock as on 31.03.24 to Rs. 1, 00,000

7. Write short notes on any four of the following: **4 x 5**

(a) Law of demand and determinants of demand, **(b)** Cobb-Douglas production function, **(c)** indifference curves, **(d)** isoquants, **(e)** external economies of scale, **(f)** assumptions and characteristics of utility.

8. Prove that marginal utility of money (MUm) is constant. What is a Giffin good? If the demand curve P = 20 – 0.1Qd and the supply curve P = 5 + 0.05Qs, calculate market equilibrium price (P*) and market equilibrium quantity (Q*). Calculate the unit elastic point of the previous demand equation. Explain law of returns. **6 + 2 + 3 + 4 + 5**