Ex/ET/HS/B/T/422/2024

Bachelor of Electronics and Telecommunication Engineering Examination, 2024

(4th Year, 2nd Semester)

Industrial Management

Time: Three Hours | Full Marks: 100

Different parts of the same question should be answered together

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1. Answer any two from (a), (b) and (c) in this block **2 x 10 = 20**

(a) Summarise MBO process. **10**

(b) Enumerate advantages and disadvantages of sole proprietorship organizations. Explain types of merger **4 + 6**

(c) Summarise job shop production. Explain ' Theory X and Theory Y'. **5 + 5**

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2. Answer any two from (a), (b) and (c) in this block **2 x 15 = 30**

(a) How PERT differs from CPM? From the information provided in the following table, draw out the network diagram and find the critical path by activity on arrow method. How long the project will take to be completed? **5 + 5 + 4 + 1**

Activity	Predecessors	Duration (Days)
A	----	6
B	A	4
C	B	7
D	A	2
E	D	4
F	E	10
G	----	2
H	G	10
I	J, H	6
J	----	13
K	A	9
L	C, K	3
M	I, L	5

(b)

Year	Expenditure (Rs. in Crore)
2016	20
2017	30
2018	35
2019	45
2020	60

Project the business expenditure on new plant equipment for the year 2024 by trend projection method. **15**

(c) (i) Derive simple EOQ model with appropriate diagram, notations, assumptions, without back order and without quantity discount. **7**

(ii) An item has a yearly demand of 4000 units. The different costs in respect of make and buy options are as follows. Determine the best option.

	Buy(Rs.)	Make (Rs.)
Item cost / unit	16.00	10.00
Ordering cost / order	240.00	
Set up cost / set up		120.00
Annual carrying cost / unit / year	3.20	2.00
Production rate per year		16000 units

8

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3. Answer any two from (a), (b) and (c) **2 x 10 = 20**

(a) Data for defects on TV sets from 20 samples (sample size = 10) are shown in the table below:

Sample No.	No. of Defects	Sample No.	No. of Defects	Sample No.	No. of Defects	Sample No.	No. of Defects
1	6	6	4	11	6	16	6
2	4	7	5	12	5	17	4
3	5	8	6	13	4	18	7
4	7	9	8	14	7	19	7
5	4	10	7	15	8	20	7

Plot a c-chart on a graph paper and comment on your findings. **10**

(b) A departmental store with a bakery section is faced with the problem of how many cakes to buy in order to meet the day's demand. The departmental store prefers not to sell day-old cakes. Leftover cakes are, therefore, a complete loss. On the other hand, if the day's demand is more than the stock, the additional sales will be lost. The store has now collected information on the past sales based on selected 100 day period, as shown in the following table:

Sales per day (Quantity)	15	16	17	18
Number of days	20	40	30	10

Construct a conditional profit matrix. What is the optimal number of cakes that should be bought each day in order to maximize the store's expected profit? A cake costs Rs. 4 /- and is sold at Rs. 5 /-. **6 + 4**

(c) Define' predictive maintenance'. What is its primary goal? Describe predictive maintenance methodologies. **1 + 1 + 8**

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4. Answer any two from (a), (b) and (c) **2 x 10 = 20**

(a) A marketing manager has five salesmen and five sales districts. Considering the capabilities of the salesmen and nature of the districts, the marketing manager estimates that the sales per month (in hundred rupees) for each salesman in each district would be as follows:

		Districts				
		A	B	C	D	E
Salesmen	1	32	38	40	28	40
	2	40	24	28	21	36
	3	41	27	33	30	37
	4	22	38	41	36	36
	5	29	33	40	35	39

Solve the assignment of salesmen to districts that will result in maximum sales. Apply Hungarian method only. **10**

(b) Obtain the optimal strategies for both the players and the value of the game for two person zero-sum game whose payoff matrix is given as follows (apply sub-game method only): **10**

		Player B	
		B1	B2
Player A	A1	- 6	7
	A2	4	- 5
	A3	- 1	-2
	A4	- 2	5
	A5	7	- 6

(c) The Phlebotomy room of Shiv Shyama Clinic has a queuing system for blood draws. An average of 25 patients arrives for a blood draw each hour. One full-time (very experienced) phlebotomist can take one patient every two minutes, thus 30 draws per hour can be done.

Find out:

(i) The probability that there will be no patient in the blood drawing room.
(ii) The probability that there will be three patients in the blood drawing room.
(iii) Average number of patients waiting.
(iv) Server utilization factor.
(v) Average patients' waiting time in the system. **2 x 5**

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5. Answer any one from (a) and (b) in this block **1 x 10 = 10**

(a) Enumerate objectives of the Trade Union Act. **10**

(b) Summarise your concept of theories of wages. **10**