EX/ET/MNG/ME/T/1/421/2022

Bachelor of Electronics and Telecommunication Engineering Examination, 2022

(4th Year, 2nd Semester)

Industrial Management

Time: Four Hours | Full Marks: 70

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 7 = 14**

(a) Explain with an appropriate illustration cellular production. **7**

(b) Enumerate advantages and disadvantages of joint stock companies. Describe types of merger. **3 + 4**

(c) Summarise batch production. Explain ' Theory X and Theory Y'. **3 + 4**

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

(a) From the following data draw out a network diagram, calculate the critical path by activity on arrow method, find the project completion time. **5 + 3 + 2**

Activity	Immediate Predecessor(s)	Activity time (weeks)
A	--	4
B	--	3
C	--	25
D	A	30
E	A,B	4
F	C	15
G	C, E	8
H	C, E	6
I	D, G	3
J	F, H	3

(b)

Year	Expenditure (Rs. in Crore)
2016	25
2017	30
2018	35
2019	45
2020	60

Project the business expenditure on new plant equipment for the year 2022 by trend projection method. **10**

(c) (i) Derive simple EOQ model without back order and without quantity discount. Use calculus. **5**

(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	15.00

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		6000 units	**5**

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3. **Answer any two from (a), (b) and (c)** **2 x 7 = 14**

(a) Assume we have an automobile that is operating in its mature phase and has the following failure history:

Time to failure (hours): 100 800 1280 2600

What reliability can be expected from the automobile after 40, 200, 1000, and 5000 hours? **7**

(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 /-. **4 + 3**

(c) Describe preventive maintenance. **7**

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4. **Answer any two from (a), (b) and (c)** **2 x 7 = 14**

(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. **7**

(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): **7**

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

(c) From the following transportation cost matrix, make initial allocation by LCM method. **7**

	D1	D2	D3	D4	SUPPLY
S1	19	30	50	10	7
S2	70	30	40	60	9
S3	40	8	70	20	18
DEMAND	5	8	7	14	34

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5. Answer any one from (a) and (b) in this block **1 x 8 = 8**

(a) State the objectives of the Trade Union Act. **8**

(b) Enumerate objectives of and drawbacks of wages incentives plan. **8**