

EX/IEBE/Prod/T/421/2018

Bachelor of Instrumentation & Electronics Engineering Examination, 2018
(4th Year, 2nd Semester)
Industrial Management

Time: Three Hours

Full Marks: 100

Different parts of the same question should be answered together

1. Answer any two from (a), (b) and (c) in this block

2 x 10 = 20

(a) Classify and summarise functions of management.

10

(b) Who is the father of modern management? Enumerate 14 principles of management as recommended by him.

1 + 9

(c)

Year	Expenditure (Rs. in Crore)
2011	20
2012	30
2013	35
2014	45
2015	60

Project the business expenditure on new plant equipment for the year 2018 by trend projection method. **10**

2. Answer any two from (a), (b) and (c) in this block

2 x 15 = 30

(a) The following table shows the activities of a network optimistic (a), most likely (m), and pessimistic (b) time estimates in number of weeks. Draw the project network and find the probability of the project completion in 20 weeks. A table of 'Standard Normal Probabilities for Z-scores' has been provided in **Appendix - 1**. **15**

Job	A	B	C	D	E	F	G	H	I	J
a	4	1	2	3	2	1.5	1.5	2.5	1.5	1
m	5	1.5	3	4	3	2	3	3.5	2	2
b	12	5	4	11	4	2.5	4.5	7.5	2.5	3
Predecessor	None	None	A	A	A	C	D	B, E	H	F, G, I

(b) (i) The JU IEE students have invented a specialty satellite smart phone (Cosmic Phone). Phones are now up for sale from the departmental office under a queuing system. The sale is reserved as one for each buyer. An average of 25 buyers arrives for purchasing each hour. One contractual employee (Ganesh) can sell a phone on FIFO basis to one buyer every two minutes. Find out the probability that there will be one buyer in the office room, plus the probability that will be two buyers in the office room. **2 + 2**

(ii) 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 /-. 7 +

(c) 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): 15

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

(d) 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
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.

15

Answer any two from (a), (b) and (c) in this block

2 x 10 = 20

(a) What are the ways to improve reliability? Explain Bath Tub curve.

4 + 6

(b) Define 'predictive maintenance'. What is its primary goal? Describe predictive maintenance methodologies.

1 + 1 + 8



