Total No. of Questions : 4]

SEAT No. : ____

PC1058

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T.Y.B.Com.

356 - F : BUSINESS STATISTICS - III

(2019 Pattern) (Semester- V)

Time : 2½ Hours] ***[Max. Marks : 50***

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Use of statistical table and calculator is allowed.***

Q1) a) Fill in the blanks (any five): **[5]**

i) In game theory, if _____ ≠ minimax, then there does not exist saddle point.
ii) C-chart is used to control _____.
iii) P-chart is used to control _____.
iv) In replacement problem, maintenance cost is always _____.
v) We use _____ criteria to average the elements of payoff of corresponding strategy.
vi) Electronic fluctuations is belonging to _____ causes.

b) State whether each of the following statement is true or false. (Any Five) **[5]**

i) If the value of the game is less than zero then game is called as fair game.
ii) P-chart is used to control proportion of defectives.
iii) In two person zero-sum game, value of the game is always zero.
iv) If quantity in hand is greater than demand then there exist opportunity loss.
v) In replacement problem, we can use value of money which remains same during the period.
vi) Control charts are applying on continuous production process.

Q2) Attempt any two of the following: (5 each) **[10]**

a) Solve the following game:

		Player B		
		B_1	B_2	B_3
Player A	A_1	1	7	2
	A_2	6	2	7
	A_3	6	1	6

P.T.O.

b) Explain the concept of process capability study. Also state the interpretation of capability index C_p and C_{pk}.

c) The number of defects in 10 different carpets are as follows:

1, 0, 2, 3, 1, 2, 1, 3, 0, 0.

Construct C-chart. Comment.

d) What do you meant by control limits? What purpose do they serve in control charts? Write control limits for p-chart.

Q3) a) The following data on the basis of sample of 5 being taken every hour. **[8]**

Sample No.	1	2	3	4	5	6	7	8	9	10
Mean	1080	1390	1460	1380	1090	1230	1370	1310	1630	1230
Range	420	670	180	320	70	690	950	380	1080	580

Construct control charts for mean and range. Comment on whether the process seems to be under control. (n=5, A_2=0.577, D_3=0, D_4=2.115).

b) The demand for a cake in the bakery may be 30, 40, 50, 60 and 70 with respective probabilities 0.2, 0.2, 0.3, 0.2, 0.1 purchasing cost and selling price of cake is Rs. 5 and Rs. 10 respectively. Balance cake is treated as waste. Write the pay-off matrix for the given situation. How much cake should be making using EoL criteria? **[7]**

Q4) a) The maintenance cost and resale value per year of a machine whose purchase price is Rs. 7,000 is given below. **[8]**

Year	1	2	3	4	5	6	7	8
Maintenance Cost (Rs.)	900	1200	1600	2100	2800	3700	4700	5900
Resale value (Rs.)	4000	2000	1200	600	500	400	400	400

Determine at which time it is profitable to replace the machine.

b) For the following pay-off table find the optimal strategy by maximax, maximin, Laplace criterion and Helrwicz criterion. ($\alpha = 0.8$) **[7]**

State of Nature → / Act ↓	N_1	N_2	N_3	N_4
S_1	12	7	8	3
S_2	9	8	6	7
S_3	7	8	8	11