Total No. of Questions : 12]

SEAT No. :

P-783

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[6006]-16

F.Y. M.C.A. (Engg.)

PROBABILITY AND STATISTICS

(2019 Pattern) (Semester - II) (310910)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Figures to the right side indicate full marks.***
2) ***Assume suitable data, if necessary***
3) ***Use of probability table, electronic pocket calculator is allowed.***

Q1) a) Define probability and explain the concept of sample space and event. **[6]**

b) A pair of dice is thrown find the probability of getting the sum. **[6]**

i) More than nine

ii) Multiple of 3

iii) Divisible by 3 or 4

OR

Q2) a) State and prove Bayes' Theorem. **[6]**

b) From a group of 7 men and 6 women, five persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done? **[6]**

Q3) a) What is sampling explain the types of sampling. **[6]**

b) Below data gives the information of heights of persons calculate mean, median, mode, variance and standard deviation.

heights = [168, 170, 150, 160, 182, 140, 175, 191, 152, 150] **[6]**

OR

Q4) a) Write a note on regression and there methods. **[6]**

b) What are the types of population in statistics? Explain with example. **[6]**

P.T.O.

Q5) a) Write a note on Geometric Distribution. **[5]**

b) A die is thrown 3 times. If getting a 6 is considered as success find the probability of atleast 2 success. **[6]**

OR

Q6) a) Write a note on Binomial Distribution. **[5]**

b) Find p for a Binomial variate X if n = 6 and 9P(X = 4) = P(X = 2). **[6]**

Q7) a) The p.d.f of a continuous random variable X is given by **[6]**

f(x) = kx, 2<=x<=4

i) Find k

ii) P[2<=x<=3]

iii) P[x>=3]

b) Prove : COV [X, Y] = E[X, Y] – {E[X] * E[Y]}. **[6]**

OR

Q8) a) A joint probability distribution of a pair of random variables is given by the following table **[6]**

Y/X	1	2	3
1	0.1	0.1	0.2
2	0.2	0.3	0.1

Find :

i) Conditional distribution of X given Y = 1

ii) P[(X + Y) < 4]

iii) Marginal Distribution of X

iv) Conditional Distribution of Y given X = 2

b) What is continuous random variable and probability density? **[6]**

Q9) a) What is significance testing? How does it differ from hypothesis testing? **[6]**

b) Explain r*c test for independence. **[6]**

OR

Q10) a) Explain the terms : **[6]**

i) Interval estimate

ii) Unbiased estimate

iii) Efficient estimate

iv) Confidence limit

b) What is P value of test? How do we compute P value for two tailed test? **[6]**

Q11) a) Kinder Land Child Care uses a c-chart to monitor the number of customer complaints per week. Complaints have been recorded over the past 20 weeks. Develop a control chart with three-sigma control limits using the following data : **[5]**

Week	Number of Complaints	Week	Number of Complaints
1	0	11	4
2	3	12	3
3	4	13	1
4	1	14	1
5	0	15	1
6	0	16	0
7	3	17	2
8	1	18	1
9	1	19	2
10	0	20	2
		Total	30

b) What is control chart? Name the types of control charts and explain them in brief. **[6]**

OR

Q12) a) Explain Statistical Quality Control with its advantages and limitations. **[6]**

b) Explain r*c test for independence. **[5]**