APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY
08 PALAKKAD CLUSTER

Q.P.Code : TE0819MA201-I **(Pages: 3)** **Name:** .....

Reg. No:.....

FIRST SEMESTER M.TECH. DEGREE EXAMINATION DECEMBER 2019

Branch: Civil Engineering **Specialization: Transportation Engineering**

08MA6201 APPLIED STATISTICS AND PROBABILITY

Time:3 hours **Max.marks: 60**

Answer all six questions.

Modules 1 to 6: Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

Q.no.	Module 1	Marks
1.a	Find the mean and variance of Poisson distribution.	3

Answer b or c

b	In a normal distribution 35 % of observations are below 40 and 15% are above 70. Find mean and variance of the normal distribution	6
c	Fit a normal distribution for the following data	6

X	0	1	2	3	4
P(X)	10	15	35	30	10

Q.no.	Module 2	Marks
2.a	Suggest an unbiased estimator for p if X follows binomial distribution.	3

Answer b or c

b	A sample of 30 members has a mean 3.4 cm and s.d 2.61 cm. Is the sample from a population of mean 3.25 cm and s.d 2.61 cm.	6
c	In one sample of 9 observations the sum of deviations of sample values from the sample mean was 94.8 and in the other sample of 10 observation it was 102.6. Test whether this difference is significant at 5% level.	6

Q.no.	Module 3	Marks
3.a	Define partial and multiple correlation coefficients	3

Answer b or c

b Fit a linear equation to the following data by the method of least squares and also find the value of x=6. **6**

X	1	2	3	4	5
F	7	10	21	28	32

c In a partially destroyed laboratory records of an analysis of correlation data only following results only legible: **6**

Variance of x = 4, Regression equations 8x-10y+66=0,

40x-18y=214. What are

i. the mean values of x and y
ii. the correlation coefficient between x and y
iii. standard deviation of y

Q.no.	Module 4	Marks
4.a	Explain the ANOVA for CRD.	3

Answer b or c

b Three varieties of a crop are tested in a randomized block design with four replications, the layout being as given below. The yields are given in kilograms. Analyse for significance. **6**

C52	A55	B56	A53
A51	B53	C56	C55
B54	C57	A53	B54

c Analyse the variance in the following Latin square of yield (in kgs) of paddy where A,B,C,D denote different methods of cultivation: **6**

D152	A151	C153	B152
B154	C153	A152	D155
A150	B149	D150	C151
C152	D153	B151	A152

Examine whether the different methods of cultivations have given significantly different yields.

Q.no.	Module 5	Marks
5.a	Explain different methods to estimate trend.	4

Answer b or c

b	Explain moving average to estimate trend .	8
c	Calculate the sessional indices from the following data using Ratio to trend method	8

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1992	72	68	80	70
1993	76	70	82	74
1994	74	66	84	80
1995	76	74	84	78
1996	78	74	86	82

Q.no.	Module 6	Marks
6.a	Define mulivariate normal distribution.	4

Answer b or c

b	Explain the principle components	8
c	Let $f(x,y) = 2-x-y \quad 0< y <1, 0< x <1$ Find $f(y/x), f(x), g(y), f(x/y)$	8