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R-13

Code: 1GC42

II B.Tech. II Semester Supplementary Examinations March 2021

Probability & Statistics

(Common to CE, ME, CSE & IT)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

1. a) Find the mean, median, mode and standard deviation for the following distribution.

x	1	2	3	4	5	6	7	8
y	4	9	6	25	22	18	7	3

10M

b) Find the coefficient of the correlation for the following

x	0	5	10	15	20
y	1	15	20	35	40

4M

2. a) State and prove Bayes' theorem

7M

b) Three urns contain: 3 red, 4 white and 1 blue balls; 1 red, 2 white and 3 blue balls; 4 red, 3 white, and 2 blue balls. One urn is chosen at random and a ball is withdrawn. If happen to be red, what is the probability that it came from urn II.

7M

3. a) A random variable X has the following probability function

x	0	1	3	4	5	6	7
P(x)	0	K	2K	2K	3K	K ²	7K ² +K

Find K and P(0<X<5)

7M

b) If X is a continuous random variable and Y=aX+b, prove that E(Y)=aE(X)+b and Var (Y)= a² Var(X), where a and b are constants.

7M

4. a) Determine the Binomial distribution for which the mean is 4 and variance 3

6M

b) Fit a Poisson distribution for the following data and calculate the expected frequencies

x	0	1	2	3	4
f(x)	109	65	22	3	1

8M

5. A population consists of six numbers 4,8,12,16,20,24. Consider all samples of size two which can be drawn without replacement from this population. Find

- i. Population mean
- ii. Population S.D
- iii. Mean of the sampling distribution of means
- iv. S.D of the sampling distribution of means.

14M

6. a) A random sample of size 100 has a standard deviation of 5. What can you say about the maximum error with 95% confidence?

7M

b) A sample of 11 rats from a central population had an average blood viscosity of 3.92 with a standard deviation of 0.61. Estimate the 95% confidence limits for the mean blood viscosity of the population.

7M

7. Two horses A and B were tested according to the time (in seconds) to run a particular track with the following results.

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	--

Test whether the two horses have the same running capacity.

14M

8. Four methods are under development for making discs of a super conducting material. Fifty discs are made by each method and they are checked for super conductivity when cooled with liquid.

	1st Method	2ndMethod	3rdMethod	4thMethod
Super Conductors	31	42	22	25
Failures	19	8	28	25

Test the significant difference between the proportions of conductors at 0.05 level.

14M
