Code No : **19SHT302**

R19

II B. Tech I Semester Regular Examinations, March - 2021

PROBABILITY AND STATISTICS

(Common CSE and IT)

Time : 3 Hours **Max. Marks : 60**

Note : Answer **ONE** question from each unit **(5 × 12 = 60 Marks)**

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UNIT-I

1. a) Discuss various methods of collecting the primary data. [6M]

   b) The following speeds were recorded at a busy city junction. Compute the Mean and Mode. [6M]

Speed (miles/ hour)	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60- 64
No. of Vehicles	8	6	29	63	60	74	29	14	15	2

(OR)

2. a) What are measures of central tendency? Write a note on any two of them. [6M]

   b) Compute the Quartile's coefficient of skewness for the following distribution [6M]

x	3-7	8-12	13-17	18-22	23-27	28-32	33-37	38-42
f	2	108	580	175	80	32	18	5

UNIT-II

3. a) Fit the exponential curve $y = ae^{bx}$ for the following data. [6M]

x	1	2	3	4	5	6
y	1.6	4.5	13.8	40.2	125	300

   b) Ten dancers were ranked by two judges in the following order. Find the rank correlation. [6M]

Judge 1	1	6	5	10	3	2	4	9	7	8
Judge 2	6	4	9	8	1	2	3	10	5	7

(OR)

4. The marks obtained by ten students in two subjects are given below. Find the coefficient of correlation and the two regression lines. [12M]

Marks in Subject 1 (x)	75	30	60	80	53	15	40	38	48	35
Marks in Subject 2 (y)	45	54	91	58	63	35	43	45	44	85
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UNIT-III

5. a) If X is a random variable having probability density function [6M]

$$f(x) = \begin{cases} \frac{1}{2}(x+1) & -1 < x < 1 \\ 0 & \text{otherwise} \end{cases}.$$

Estimate the mean and variance of the distribution.

b) Discuss about normal distribution. Write any five properties of normal distribution. [6M]

(OR)

6. a) State and prove Baye's theorem. [6M]

b) Suppose that 5 men out of 100 and 25 women out of 10,000 are colour blind. A person is chosen at random. What do you think that the probability of the selected person being a male, assuming that the males and females are equal in number? [6M]

UNIT-IV

7. a) A population consists of the five numbers 3, 6, 9, 15 and 27. Consider all possible samples of size 2 that can be drawn with replacement from this population. Estimate [12M]

   a) The mean of the population
   b) The standard deviation of the population
   c) The mean of the sampling distribution of means
   d) The standard deviation of the sampling distribution of means

(OR)

8. a) A random sample of size 81 is taken from a population whose variance is 20.25 and mean is 32. Construct a 99% confidence interval. [6M]

b) The mean of certain normal population is equal to the standard error of the mean of the samples of 64 from that distribution. Find the probability that the mean of the sample size 36 will be negative. [6M]

UNIT-V

9. a) A random of 10 boys had the following I.Q.s 70, 120, 110, 101, 88, 83, 95, 98, 107 and 100. Do the data support the assumption of population mean I.Q. of 100? Test at 5% level of significance. [6M]

b) A bulk user buys 50 lamps each manufactured by companies 'X' and 'Y'. During their usage it was found that the bulbs manufactured by the company X gave an average life of 1500 hours with a standard deviation of 60 hours and the ones manufactured by the company Y gave an average of 1512 hours with a standard deviation of 80 hours. Is there a significant difference in the mean life of the two makes of lamps? (Use 1% level of significance). [6M]

(OR)

10. a) The number of accidents at a particular junction on a highway per month are as follows: 12, 2, 10, 15, 8, 20, 14, 9, 4, 6. Use chi-square test to determine if these frequencies are in agreement with the belief that accident conditions were the same during the 10-month period. [6M]

b) In a village 325 men out of 600 men were found to be smokers. Does this information support the conclusion that the majority of the men in this village are smokers? [6M]

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