Regulation R18 Subject Code:2H3AE

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech. III Semester Supplementary Examinations, July 2022

PROBABILITY & STATISTICS

(Common to CE,ME,CSE & IT)

Maximum Marks: 70 Date:19.07.2022 Duration: 3Hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 10 questions. Answer any 5 questions.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 Define a Random Variable

2 If $f(x) = k\, e^{-x/5}, x>0$ is a probability density function then find k?

3 Define binomial distribution

4 If $\mu = 5$,and $\sigma = 2$,then write the equation of the normal distribution

5 Write the one use of regression

6 Write the normal equations of straight line

7 Define type I error.

8 Define Right tailed test.

9 Find $t_{0.05}$ when $v = 16$.

10 Find chi- square value for 1 degree of freedom at 5% level of significance

Part-B

Answer any five from the following questions. (5X10M=50Marks)

11 A continuous random variable has the probability function

$$f(x) = \begin{cases} K\, x\, e^{-\lambda x} & \text{for } x \geq 0,\ \lambda > 0 \\ 0 & \text{otherwise} \end{cases}$$

Determine (i) k (ii) Mean (iii) Variance [10]

OR

12 Let 'X' denote the sum of the two numbers that appear when a pair of fair dice is tossed

Determine the (i) Distribution function (ii) Mean and (iii) Variance [10]

13 It has been found that 2% of the tools produced by a certain machine are defective what is the probability that in a shipment of 400 such tools. [10]

(a) 3% of more (b) 2% or less will prove defective

OR

14 Out of 800 families with 5 children each how many would you expect to have (i) 3 boys (ii) 5 girls (iii) either 2 or 3 boys (iv) at least one boy ? Assume equal probabilities for boys and girls. [10]

15 A panel of two judges P& Q graded seven dramatic performance by independently awarding marks as follows.

Performance	1	2	3	4	5	6	7
Marks by P	46	42	44	40	43	41	45
Marks by Q	40	38	36	35	39	37	41

The eight performance, which judge Q would not attend, was awarded 37 marks by judge p, if judge Q has also been present, how many marks would be expected to have been awarded by him to the eight performance. [10]

OR

16 Find if there is any significant correlation between the heights and weights given below. [10]

Height in inches	57	59	62	63	64	65	55	58	57
Weight in lbs	113	117	126	126	130	129	111	116	112

17 Random samples of 400 men and 600 women were asked whether they would like to have a flyover near the residence, 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favor of the proposal are same, at 5% level. [10]

OR

18 In a city A 20% of a random sample of 900 school boys has certain slight physical defect. In another city B 18.5% of a random sample of 1600 schoolboys has the same defect. Is the difference between the proportion significance at 5% level. [10]

19 To compare two kinds of bumper guards 6 of each kind were mounted on a car and then the car was run in to a concrete wall the following are the costs of repairs.

Guard1	107	148	123	165	102	119
Gaurd2	134	115	112	151	133	129

Use the 0.01 level of significance to test whether the difference between two sample means is significant. [10]

OR

20 The means of two random samples of sizes 9 and 7 are 196.42 and 198.82 respectively. The sum of the squares of the deviations from the mean are 26.94 and 18.73 respectively, can the sample be considered to have been from the same normal population. [10]