



R18 Regulation

Subject code: 2H3AE

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech III Semester Regular/Supplementary Examinations, February 2021

PROBABILITY AND STATISTICS
(Common to CE,ME,CSE & IT)

Maximum Marks: 70

Date: 26.02.2021 Duration: 3 hours

- 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 5 Units. Answer any one full question from each unit.
 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

(2M X 10=20 Marks)

1. If the probability that a target is destroyed on any one shot is 0.5. What is the probability that it would be destroyed on 6th attempt.
2. If X_1, X_2 are two random variables and a,b are constants then $E(aX_1 + bX_2)$?
3. If X is a poisson variate such that $p(x=0) = p(x=1) = K$. Determine K
4. The two lines of regression are $8x-10y+66=0; 40x-18y-214=0$ Find the mean values of x and y?
5. Define Type-I and Type-II errors
6. Write any two uses of Chi-square distribution.
7. Write the test statistic of single mean in large samples.
8. Define critical region.
9. Write the assumptions of student's t- test.
10. Write the formula for F- test.

Part-B

Answer All the following questions.

(10M X 5=50Marks)

11. A continuous random variable 'X' is defined by [10M]

$$f(x) = \begin{cases} \frac{1}{16}(3+x)^2, & \text{if } -3 \leq x \leq -1 \\ \frac{1}{16}(6-2x^2), & \text{if } -1 \leq x < 1 \\ \frac{1}{16}(3-x)^2, & \text{if } 1 \leq x \leq 3 \\ 0 & \text{elsewhere} \end{cases}$$

Verify that $f(x)$ is a density function & also find the Mean of 'x'

OR

12 An electrical firm manufactures light bulbs that have a life, before burnout, which is normally distributed with mean equal to 800h and a standard deviation of 40h. Find the probability that a bulb burns between 778h and 834h. [10 M]

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

(a) 3% of more (b) 2% or less will prove defective [10M]

OR

14 A random sample of size 100 is taken from a population whose mean is 60 and variance is 400. Using central limit theorem, with what probability can we assert that mean of the sample will not differ from $\mu = 60$ by more than 4? [10M]

15 Fit a second degree polynomial to the following data $y = a + bx + cx^2$ [10M]

X	1	2	3	4	5	6	7
y	2.3	5.2	9.7	16.5	29.4	35.5	54.4

OR

16 Fit a following of the curve $y = ae^{bx}$

X	2	3	4	5	6
Y	144	172.8	207.4	248.8	298.5

17 A sample of 64 students have a mean weight of 70 kgs. Can this be regarded as a sample from a population with mean weight 56 kgs and standard deviation 25 kgs.

OR

18 A simple sample of the heights of 6400 English men has a mean of 67.585 inches and a S.D of 2.56 inches while a simple sample of height of 1600 Australians has mean of 68.55 and a S.D of 2.52. D the data indicate the Australians are on the average taller than Englishmen use 1% l.o.s (10M)

- 19 The number of automobile accidents per week in a certain community are as follows: 12,8,20,2,14,10,15,6,9,4. Are these frequencies in agreement with the belief that accident conditions were the same during this 10 week period. (10M)

OR

- 20 Given the following contingency table for hair colour and eye colour .find the value of Chi- square ,Is there good association between the two.

		Hair colour			
Eye colour		Fair	Brown	Black	Total
	Blue	15	5	20	40
	Grey	20	10	20	50
	Brown	25	15	20	60
	total	60	30	60	150

[10M]

