Q.P. Code: 18HS0833 **R18**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations February-2022

PROBABILITY & STATISTICS, NUMERICAL METHODS

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

1 **a** If the probability density of random variable is given by **2M**

$f(x)=\begin{cases} k(1-x^2), for\ 0<x<1 \\ 0, elsewhere \end{cases}$, then find the value of k?

b Define Poisson distribution. **2M**

c Find the median of the following values 26, 8, 6, 12, 15, 32. **2M**

d Write the formula to find a cube root of a number by Newton Raphson's method. **2M**

e Write R-K method of 4^{th} order formula. **2M**

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2 In a certain college 25% of boys and 10% of girls are studying mathematics. The girls constitute 60% of the student body. (a) What is the probability that mathematics is being studied? (b) If a student is selected at random and is found to be studying mathematics, find the probability that the student is a girl? (c) a boy. **10 M**

OR

3 A random variable X has the following probability function **10 M**

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

Determine (i) K (ii) Evaluate $P(X\geq 6)$ and $P(0<X<5)$ (iii) if $P(X\leq K)>1/2$, find the minimum value of K (iv) variance.

UNIT-II

4 **a** 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 3boys? Assume equal probabilities for boys and girls. **6 M**

b Two dice are thrown five times. Find the probability of getting 7 as sum (i) at least once (ii) $p(1<x<5)$. **4 M**

OR

5 Find the mean and variance of a Normal distribution in which 7% of items are under 35and 89% are under 63. **10 M**

UNIT-III

6 Compute the first four central moments to the following data and also find Sheppard's correction, β_1 and β_2 **10 M**

Class intervals	0-10	10-20	20-30	30-40	40-50	50-60	60-70
frequency	2	8	12	40	20	15	3

OR

7 **a** Obtain the rank correlation coefficient for the following data : **5 M**

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

b Find two regression equations from the following data: **5 M**

X	10	25	34	42	37	35	36	45
Y	56	64	63	58	73	75	82	77

UNIT-IV

8 Find out the equation $x log(x)_{10} = 1.2$ using false position method. **10 M**

OR

9 **a** Using Newton's forward interpolation formula and the given table of values **5 M**

x	1.1	1.3	1.5	1.7	1.9
f(x)	0.21	0.69	1.25	1.89	2.61

Obtain the value of f(x) when x=1.4

b Use Newton's Back ward interpolation formula to find f(32). Given f (25) =0.2707, f (30) =0.3027, f (35) =0.3386, f (40) =0.3794 **5 M**

UNIT-V

10 Using R-K method of 4th order, solve $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$, y(0)=1 find y(0.2) and y(0.4). **10 M**

OR

11 Solve $y'' - x(y')^2 + y^2 = 0$ Using R-K method of 4th order for $x = 0.2$ given y (0) = 1, y^1 (0) =0 (take h=0.2). **10 M**

END