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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

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

NUMERICAL METHODS, PROBABILITY & STATISTICS

(Common to CE, ME and AGE)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 Using Newton-Raphson method (i) Find square root of 28 (ii) Find cube root of 15 L3 12 M

OR

- 2 From the following table values of x and $y = \tan x$. Interpolate values of y when $x=0.12$ and $x=0.28$. L1 12 M

x	0.10	0.15	0.20	0.25	0.30
y	0.1003	0.1511	0.2027	0.2553	0.3093

UNIT-II

- 3 Using Taylor's series method find an approximate value of y at $x = 0.2$ for the differential equation $y' - 2y = 3e^x$, $y(0) = 0$. Compare the numerical solution obtained with exact solution. L3 12 M

OR

- 4 a Compute $\int_0^4 e^x dx$ by Simpson's $\frac{3}{8}$ th rule with 12 sub divisions. L5 6M

- b Compute $\int_3^7 x^2 \log x dx$ by Trapezoidal rule and Simpson's $\frac{1}{3}$ rd rule by taking 10 sub divisions. L5 6M

UNIT-III

- 5 Compute the first four central moments to the following data and also find Sheppard's correction, β_1 and β_2 L6 12 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

- 6 In a certain college 25% of boys and 10% of girls are studying mathematics. The girls constitute 60% of the student body. L6 12 M
- (i) What is the probability that mathematics is being studied?
- (ii) If a student is selected at random and is found to be studying mathematics, find the probability that the student is a girl?
- (iii) a boy.

UNIT-IV

7 Probability density function of a random variable X **L6 12 M**

$$f(x) = \begin{cases} \frac{1}{2} \sin x, & \text{for } 0 \leq x \leq \pi \\ 0, & \text{elsewhere} \end{cases}$$

Find the mean, mode and median of the distribution and also find the probability between 0 and $\pi/2$.

OR

8 A random variable x has the following probability distribution function **L1 12 M**

x	1	2	3	4	5	6	7	8
P(x)	k	2k	3k	4k	5k	6k	7k	8k

Find i) k ii) $P(X \leq 2)$ iii) $P(2 \leq x \leq 5)$.

UNIT-V

9 Out of 800 families with 5 children each, how many would you expect to have **L5 12 M**

(i) 3 boys (ii) 5 girls (iii) either 2 or 3 boys (iv) at least one boy.

OR

10 Calculate Correlation coefficient to the following data **L5 12 M**

X	10	15	12	17	13	16	24	14	22	20
Y	30	42	45	46	33	34	40	35	39	38

*** END ***