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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**B.Tech II Year I Semester Supplementary Examinations July-2022****PROBABILITY, NUMERICAL METHODS AND TRANSFORMS**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

- 1 a In a group there are 3 men and 2 women. Three persons are selected at random from this group. Apply the probability that one man and two women or two men and one woman are selected. **L3 6M**
- b Five persons in a group 20 are engineers. If three persons are selected at random, determine the probability that all engineers and the probability that at least one being an engineer. **L5 6M**

OR

- 2 In a certain college 25% of boys and 10% of girls are studying mathematics. The girls constitute 60% of the student body. **L1 12M**
- (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-II

- 3 Determine the root of the equation $x \log_{10}(x) = 1.2$ using False position method. **L5 12M**

OR

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

UNIT-III

- 5 Using R-K 4th order method for $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$, $y(0) = 1$. Find $y(0.2)$ and $y(0.4)$ **L3 12M**

OR

- 6 Evaluate $\int_0^1 \frac{1}{1+x} dx$ (i) by Trapezoidal rule and Simpson's $\frac{1}{3}$ rd rule. (ii) Using Simpson's $\frac{3}{8}$ th rule and compare the result with actual value. **L5 12M**

UNIT-IV

- 7 a Determine the Laplace transform of $f(t) = e^{3t} - 2e^{-2t} + \sin 2t + \sinh 3t + 9$ **L2 6M**
- b Find the Laplace transform of $f(t) = \frac{1 - \cos at}{t}$ **L1 6M**

OR

- 8 Apply Laplace transform method to solve the differential equation **L3 12M**
 $y'' - 3y' + 2y = 4t + e^{3t}$, where $y(0) = 1$, $y'(0) = 1$

UNIT-V

- 9 Determine the value of $Z(\cos nt)$ and $Z(\sin nt)$. Hence find (i) $Z(n \cos nt)$ (ii) $Z(n \sin nt)$ **L5 12M**

OR

- 10 Applying the Z –transform, solve $y_{n+2} - 6y_{n+1} + 8y_n = 2^n + 6n$ **L3 12M**

*** END ***