Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Regular Examinations Feb-2021

PROBABILITY, NUMERICAL METHODS AND TRANSFORMS

(Electrical & Electronics Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

1 a Two cards are selected at random from 10 cards numbered 1 to 10. Find the probability that the sum is even if (i) The two cards are drawn together. (ii) The two cards drawn one after other with replacement.   **6M**

   b Two marbles are drawn in succession from a box containing 10 red, 30 white, 20 blue and 15 orange marbles, with replacement being made after each draw. Find the probability that (i) Both are white (ii) First is red and second is white.   **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. (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.   **12M**

UNIT-II

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

OR

4 a Using Newton's forward interpolation formula and the given table of values obtain the value of $f(x)$ when $x=1.4$.   **6M**

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

   b Use Newton's backward interpolation formula to find $f(32)$ given $f(25)=0.2707$, $f(30)=0.3027$, $f(35)=0.3386$, $f(40)=0.3794$.   **6M**

UNIT-III

5 Tabulate $y(0.1)$, $y(0.2)$ and $y(0.3)$ using Taylor's series method given that $y^1 = y^2 + x$ and $y(0) = 1$ **12M**

OR

6 a Using Euler's method solve $y^1 = y^2 + x$, $y(0)=1$. Find $y(0.1)$ and $y(0.2)$ **6M**

   b Evaluate $\int_{0}^{4} e^x \, dx$ by by Simpson's 3/8 rule with 12 sub divisions   **6M**

UNIT-IV

7 a Find the Laplace Transform of $f(t) = \dfrac{1-\cos at}{t}$ **6M**

   b Find $L^{-1}\left[\log\left(\dfrac{s-a}{s-b}\right)\right]$ **6M**

OR

8   Solve $\frac{d^2x}{dt^2} + 2\frac{dx}{dt} + x = 3\,t\,e^{-t}$ using Laplace transform given that   12M

$x(0) = 4, \frac{dx}{dt} = 0$ at $t = 0$

UNIT-V

9   a   Applying linearity property, find the Z –transforms of the following functions
(i) $an^2 + bn + c$ (ii) $(n-1)^2$ 6M

   b   If $Z[f(n)] = \frac{z}{z-1} + \frac{z}{z^2+1}$, find $Z[f(+2)]$ 6M

OR

10   Solve $y_{n+2} + 2y_{n+1} + y_n = n$ using the Z –transform given that $y_0 = y_1 = 0$ 12M

*** END ***