R20

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Regular Examinations May-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 A class consists of **6** girls and **10** boys. If a committee of **3** is chosen at random from the class, find the Probability that (i) **3** boys are selected (ii) Exactly **2** girls are selected.   **L1**   **6M**

b From a city 3 newspapers A, B, C are being published. A is read by 20%, B is read by 16%, C is read by 14% both A and B are read by 8%, both A and C are read by 5% both B and C are read by 4% and all three A, B, C are read by 2%. Find out the percentage of the population that read at least one paper.   **L1**   **6M**

OR

2 Two dice are thrown. Let A be the event that the sum of the point on the faces is 9. Let B be the event that at least one number is 6.   **L1**   **12M**

Find (i) $P(A \cap B)$, (ii) $P(A \cup B)$, (iii) $P(A^c \cup B^c)$, (iv) $P(A^c \cap B^c)$.

UNIT-II

3 a Using Newton-Raphson method to value the reciprocal of 12.   **L3**   **6M**

b Find a real root of the equation $x \tan x + 1 = 0$ using Newton – Raphson method.   **L1**   **6M**

OR

4 From the following table values of x and $y = \tan x$. Find the values of y when $x = 0.12$ and $x = 0.28$ **L1**   **12M**

x	0.10	0.15	0.20	0.25	0.30
$y = \tan x$	0.1003	0.1511	0.2027	0.2553	0.3093

UNIT-III

5 a Solve $y' = x + y$, given $y(1) = 0$ find $y(1.1)$ and $y(1.2)$ by Taylor's series method.   **L3**   **6M**

b Using R-K method of 4th order find $y(0.1)$ given that $y' = 1 + x y$, $y(0) = 2$.   **L3**   **6M**

OR

6 a Compute $\int_0^{\pi/2} \sin x \, dx$, using Trapezoidal rule, Simpson's $\frac{1}{3}$ rule and compare with exact value.   **L5**   **6M**

b Calculate $\int_0^4 e^x \, dx$, by Simpson's $\frac{3}{8}$ rule with 12 sub divisions.   **L3**   **6M**

UNIT-IV

7 a Find the Laplace transform of $f(t) = \cos h\, at \cdot \sin bt$.   L1   6M

b Using Laplace transform, evaluate $\int\limits_{0}^{\infty} \dfrac{\cos at - \cos bt}{t}\, dt$.   L5   6M

OR

8 a Evaluate $L^{-1}\left[\dfrac{s^2 + s - 2}{s(s+3)(s-2)}\right]$ by using partial fractions.   L2   6M

b Using Convolution theorem, evaluate $L^{-1}\left[\dfrac{1}{\left(s^2 + a^2\right)^2}\right]$ L3   6M

UNIT-V

9 Solve $\left(D^2 + 2D + 1\right)x = 3t\, e^{-t}$ given $x(0) = 4, x'(0) = 0$, by Applying Laplace Transform technique.   L3   12M

OR

10 a Evaluate $Z\left[\dfrac{1}{(n+1)(n+2)}\right]$ L5   6M

b Calculate $Z^{-1}\left[\dfrac{z^2}{(z-1)(z-3)}\right]$, Using Convolution theorem.   L3   6M

*** END ***