

Reg. No:

--	--	--	--	--	--	--	--	--	--

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

B.Tech II Year I Semester Regular & Supplementary Examinations March-2023

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 State and prove additional probability theorem. CO1 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. CO1 L2 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. (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. CO1 L3 12M

**UNIT-II**

- 3 Find a real root of the equation  $xe^x - \cos x = 0$  using Newton - Raphson method correct to four decimal places. CO2 L3 12M

OR

- 4 Using Newton's forward and backward interpolation formulae, obtain the value of  $f(1.2)$  and  $f(1.8)$  for the given table of values CO2 L3 12M

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

**UNIT-III**

- 5 Find  $y(0.1)$  and  $y(0.2)$  using fourth order Runge-Kutta method, given that  $y' = x^2 - y$  and  $y(0) = 1$ . CO3 L3 12M

OR

- 6 Evaluate  $\int_0^1 \frac{1}{1+x} dx$  by Trapezoidal rule, Simpson's  $\frac{1}{3}$  rule and Simpson's  $\frac{3}{8}$  rule and compare the result with actual value CO4 L4 12M

**UNIT-IV**

- 7 a Find the Laplace transform of  $3 \cos 4(t-2)u(t-2)$  CO5 L2 6M  
 b Find  $L^{-1} \left\{ \frac{3(s^2 - 2)^2}{2s^5} \right\}$  CO5 L1 6M



OR

8 a Using Laplace transform, evaluate  $\int_0^{\infty} \frac{\cos at - \cos bt}{t} dt$ . CO5 L5 6M

b Find inverse Laplace transform of  $\frac{s^2 + s - 2}{s(s+3)(s-2)}$ , using partial fractions. CO5 L3 6M

UNIT-V

9 a Solve  $y'' + 7y' + 10y = 4e^{-3t}$  where  $y(0) = 0, y'(0) = -1$  by using Laplace transform method. CO6 L6 8M

b Find Z-transform of the following (i)  $ne^{-an}$  (ii)  $n^2e^{-an}$  CO6 L3 4M

OR

10 a State convolution theorem and use the theorem to CO6 L3 6M

evaluate  $Z^{-1} \left\{ \frac{z^2}{(z-a)(z-b)} \right\}$

b Find the inverse Z-transform of  $\frac{2z^2 + 3z}{(z+2)(z-4)}$  CO6 L1 6M

\*\*\* END \*\*\*