Q.P. Code: 20HS0832 **R20**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B. Tech II Year I Semester Supplementary Examinations November-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	Out of 15 items 4 are not in good condition, 4 are selected at random. Find the probability that (i) All are not good (ii) Two are not good	L3	6 M
	b	A class has 10 boys and 5 girls. Three students are selected at random one after another. Find the probability that (i) First two are boys and third is girl. (ii) First and third are of same sex and the second is of opposite sex.	L3	6 M

OR

2		In a bolt factory machines A, B, C manufacture 20%, 30% and 50% of the total of their output and 6%, 3% and 2% are defective. A bolt is drawn at random and found to be defective. Find the probabilities that it is manufactured from (i) Machine A (ii) Machine B (iii) Machine C.	L1	12 M

UNIT-II

3		Using Newton-Raphson method, obtain the values of (i) Square root of 28 (ii) Cube root of 15.	L3	12 M

OR

4	a	Using Newton's forward interpolation formula, Obtain the value of $f(x)$ when $x=1.4$ for the following table of values.	L3	6 M

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

	b	Use Newton's backward interpolation formula to find $f(32)$ for the given data $f(25)=0.2707$, $f(30)=0.3027$, $f(35)=0.3386$, $f(40)=0.3794$.	L3	6 M

UNIT-III

5	a	Solve $y'=x\,y^2+y$, given $y(0)=1$ using Taylor's series method to find $y(0.1)$ and $y(0.2)$.	L3	6 M
	b	Using R-K method of 4th order find $y(0.1)$ given that $y'=x+y$, $y(0)=1$.	L3	6 M

OR

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

UNIT-IV

7	a	Find the Laplace transform of $f(t)=e^{-3t}(\cos 4t+3\sin 4t)$.	L1	6 M
	b	Using Laplace transform, evaluate $f(t)=e^{-4t}\int_0^t \frac{\sin 3t}{t}dt$	L5	6 M

OR

8	**a**	Evaluate $L^{-1}\left[\log\left(\frac{s-a}{s-b}\right)\right]$	L5	6 M
	b	Using Convolution theorem, Find $L^{-1}\left[\frac{1}{(s+a)(s+b)}\right]$	L3	6 M

UNIT-V

9	**a**	Using Laplace Transform method to solve $y'+y=1$ given $y(0)=0$.	L3	6 M
	b	Apply Laplace transform method to solve $y''+7y'+10y=4e^{-3t}$, given $y(0)=0$, $y'(0)=-1$.	L6	6 M

OR

10		Solve the difference equation $y_{n+2}-3y_{n+1}+2y_n=0$ given that $y_0=0$ and $y_1=1$, using Z – transform.	L3	12 M

*** END ***