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

B.Tech II Year I Semester Supplementary Examinations December-2021

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. Apply the probability that (i) All are not good (ii) Two are not good. L3 6M
- b Three students A, B, C are in running race. A and B have the same Probability of winning and each is twice as likely to win as C. Find the Probability that B or C wins. L1 6M

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 12M

UNIT-II

- 3 Find a real root of the equation $xe^x - \cos x = 0$ using Newton – Raphson method. L1 12M

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	0.1003	0.1511	0.2027	0.2553	0.3093

UNIT-III

- 5 a Solve $y' = x + y$, given that $y(1) = 0$. Find $y(1.1)$ and $y(1.2)$ by Taylor's series method. L3 6M
- b Using Euler's method $y' = y^2 + x, y(0) = 1$. Find $y(0.1)$ and $y(0.2)$ L3 6M

OR

- 6 Solve $y'' - x(y')^2 + y^2 = 0$ using R-K method of 4th order for $x = 0.2$ given $y(0) = 1$ and $y'(0) = 0$ taking $h=0.2$. L6 12M

UNIT-IV

- 7 a Find the Laplace transform of $f(t) = t^2 e^{2t} \sin 3t$ L1 6M
 b Find the Laplace transform of $f(t) = e^{4t} \sin 2t \cos t$ L1 6M

OR

- 8 a Find $L^{-1} \left\{ \frac{1}{(s^2 + 5^2)^2} \right\}$, using convolution theorem L5 6M
 b Find the Inverse Laplace transform of $\frac{1}{s(s^2 + a^2)}$ L1 6M

UNIT-V

- 9 a Calculate the value of $Z \left\{ \frac{1}{(n+2)(n+1)} \right\}$ L3 6M
 b Find the Z-transform of (i) e^{-an} (ii) ne^{-an} (iii) $n^2 e^{-an}$ L1 6M

OR

- 10 Solve $y_{n+2} + 2y_{n+1} + y_n = n$. Using the Z-transform given that $y_0 = y_1 = 0$. L3 12M

*** END ***