R18

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year I Semester Supplementary Examinations November-2020
MATHEMATICS-III
(Electronics & Communication Engineering)

Time: 3 hours   Max. Marks: 60

PART-A
(Answer all the Questions **5 x 2 = 10** Marks)

1 **a** Write Trapezoidal formula.   **2M**

    b Write the diagonal five-point formula.   **2M**

    c Find $L(\cos^2 2t)$.   **2M**

    d Define the inverse Fourier sine and cosine transforms.   **2M**

    e Find the particular integral of the equation $4r + 12s + 9t = e^{3x-2y}$.   **2M**

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2 Find the root of the equation $xe^x = 2$ by using Regula-falsi method upto five decimal places.   **10M**

OR

3 The following table gives the distance in nautical miles of the visible horizon for the given heights in feet above the earth's surface: **10M**

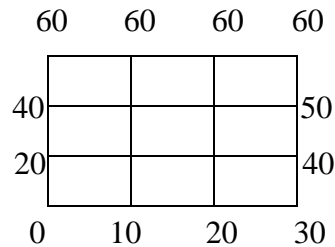| x = height	100	150	200	250	300	350	400
y = distance	10.63	13.03	15.04	16.81	18.42	19.90	21.2'

Find the values of y when (i) x = 218 ft (ii) x = 410ft

UNIT-II

4 Using R-K method of 4th order, solve $\dfrac{dy}{dx} = \dfrac{y^2 - x^2}{y^2 + x^2}$, y(0)=1 Find y(0.2) and y(0.4).   **10M**

OR

5 Solve the Laplace equation $u_{xx} + u_{yy} = 0$ given that   **10M**

UNIT-III

6 Find the inverse Laplace transform of $\dfrac{s}{s^4 + 4a^4}$.   **10M**

<div align="center">**OR**</div>

7 Solve the D.E $\dfrac{d^2 x}{dt^2} + 9x = \sin t$ using Laplace Transform given that   **10M**

$$x(0) = 1, x\left(\dfrac{\pi}{2}\right) = 1$$

<div align="center">**UNIT-IV**</div>

8

a Prove that F[x^n f(x)] $= (-i)^n \dfrac{d^n}{dp^n}\left[F(p)\right].$ **5M**

b Prove that $F_s\{$ x f(x) $\} = -\dfrac{d}{dp}\left[F_c(p)\right].$ **5M**

<div align="center">**OR**</div>

9 Solve the integral equation $\displaystyle\int_0^\infty F(x)\cos px\,dx = \begin{cases} 1 - p, & 0 \le p \le 1 \\ 0, & p > 1 \end{cases}$. Hence deduce that   **10M**

$$\int_0^\infty \dfrac{\sin^2 t}{t^2}\,dt = \dfrac{\pi}{2}.$$

<div align="center">**UNIT-V**</div>

10

a Solve $(D^2 + 3DD' + 2D'^2)z = 24xy.$ **5M**

b Solve $\dfrac{\partial^3 z}{\partial x^3} - 2\dfrac{\partial^3 z}{\partial x^2 \partial y} = 2e^{2x} + 3x^2 y.$ **5M**

<div align="center">**OR**</div>

11 The points of trisection of a string are pulled aside through the same distance on   **10M**
opposite sides of the position of equilibrium and the string is released from rest.
Derive an expression for the displacement of the string at subsequent times and show
that the midpoint of the string always remains at rest.

<div align="center">***END***</div>