Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations August-2021
NUMERICAL METHODS ANDTRANSFORMS
(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 Using Newton-Raphson method (i) Find square root of 28 (ii) Find cube root of 15. **12 M**

OR

2 From the following table values of x and $y=tan\,x$. Interpolate values of y when $x=0.12$ and $x=0.28$. **12 M**

x	0.10	0.15	0.20	0.25	0.30
y	0.1003	0.1511	0.2027	0.2553	0.3093

UNIT-II

3 Using Euler's method, find an approximate value of y corresponding to $x=1$ given that $\frac{dy}{dx} = x + y$ and $y = 1$ when $x = 0$ taking step size $h = 0.1$ **12 M**

OR

4 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^1(0)=0 taking h=0.2 **12 M**

UNIT-III

5 a Find the Laplace transform of $f(t) = \left(\sqrt{t} + \frac{1}{\sqrt{t}}\right)^3$. **6M**

  b Find the Laplace transform of $f(t) = e^{4t}\sin2t\,\cos t$. **6M**

OR

6 a Find the Inverse Laplace transform of $\frac{1}{s(s^2 + a^2)}$. **6 M**

  b Find $L^{-1}\left\{s\log\left(\frac{s-1}{s+1}\right)\right\}$. **6 M**

UNIT-IV

7 a If $f(x) = |\sin x|$, expand f(x) as a Fourier series in the interval $(-\pi, \pi)$. **6 M**

  b Find the half range cosine series for $f(x) = x$ in the interval $0 \le x \le \pi$. **6 M**

OR

8 a Find the half range sine series expansion of $f(x) = x^2$ when $0 < x < 4$. **6 M**

  b Find the half range cosine series expansion of $f(x) = x(2 - x)$ in $0 \le x \le 2$. **6 M**

UNIT-V

9 Find the Fourier sine and cosine transforms of f(x)=$\frac{e^{-ax}}{x}$ and deduce that $\int_0^\infty \frac{e^{-ax} - e^{-bx}}{x}\sin sx\,dx = \tan^{-1}\left(\frac{s}{a}\right) - \tan^{-1}\left(\frac{s}{b}\right)$. **12 M**

OR

10 a Find the Fourier cosine transform of $e^{-ax} \cos ax, a > 0$.   6 M

   b   6 M

   Find the Fourier cosine transform of $f(x) = \begin{cases} x, & for\ 0 < x < 1 \\ 2 - x, & for\ 1 < x < 2 \\ 0, & for\ x > 2 \end{cases}$.

*** END ***