Q.P. Code: 16HS602 **R16**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations July-2022

ENGINEERING MATHEMATICS-I

(Common to All)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1 **a** Solve $\left(1+e^{\frac{x}{y}}\right)dx+e^{\frac{x}{y}}\left(1-\frac{x}{y}\right)dy=0$ **6M**

b Solve $(D^2-4D+4)y=8e^{2x}\sin 2x$ **6M**

OR

2 A body is originally at 80^0C and cools down to 60^0C in 20 min. If the temperature of the air is 40^0 C, find the temperature of the body after 40 min? **12M**

UNIT-II

3 **a** Expand $\log_e$ (x) in powers of (x-1) and hence evaluate log(1.1) correct to 4 decimals **6M**

b Find the radius of curvature of the curve $x^2y=a(x^2+y^2)\ at\ (-2a,2a)$ **6M**

OR

4 Find the volume of the largest rectangular parallelopiped that can be inscribed in the ellipsoid $4x^2+4y^2+9z^2=36$ **12M**

UNIT-III

5 **a** Evaluate $\int_0^1\int_0^{x^2} e^{y/x}\,dy\,dx$ **6M**

b Evaluate $\int_{-c}^{c}\int_{-b}^{b}\int_{-a}^{a}\left(x^2+y^2+z^2\right)dx\,dy\,dz$ **6M**

OR

6 Evaluate the integral by changing the order of integration $\int_0^1\int_{x^2}^{2-x} xy\,dy\,dx$ **12M**

UNIT-IV

7 **a** Find i) L(sin at) ii) L(cos at) **6M**

b Find the Laplace transform of $f(t)=\int_0^t e^{-t}\cos t\,dt$ **6M**

OR

8 **a** Find the Laplace transform of $f(t)=t^2\sin 3t$ **6M**

b Find the Laplace transform of $f(t)=\frac{1-\cos at}{t}$ **6M**

UNIT-V

9 **a** Find the Inverse Laplace Transform of $\frac{5s-2}{s^2(s+2)(s-1)}$ **6M**

b Find the inverse Laplace transform of $\log\left(1-\frac{a^2}{s^2}\right)$ **6M**

OR

10 Using the Convolution Theorem find $L^{-1}\left\{\frac{1}{(s^2+9)(s^2+1)}\right\}$ **12M**

*** END ***