Q.P. Code: 16HS602 R16

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations November 2020

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 $x\frac{dy}{dx}+y=\log x$ **6M**

b Solve $\frac{dy}{dx}+y\tan x=y^2\,Sec\,x$ **6M**

OR

2 Solve $(D^3+2D^2+D)y=e^{2x}+x+Sin\,2x$ **12M**

UNIT-II

3 **a** If $u=\frac{yz}{x};v=\frac{zx}{y};w=\frac{xy}{z}$, $show\,that\,\frac{\partial(u,v,w)}{\partial(x,y,z)}=4$ **6M**

b Expand log(1+ ex) is ascending powers of x **6M**

OR

4 **a** Find the radius of curvature at the origin for the curve $y^4+x^3+a(x^2+y^2)-a^2y=0$ **6M**

b Find the minimum value of $x^2+y^2+z^2$ given $x+y+z=3a$ **6M**

UNIT-III

5 **a** Find $\iint(x^2+y^2)dxdy$ over the area bounded by the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ **6M**

b Evaluate the following integral by transforming into polar coordinates

$\int_0^\infty\int_0^\infty e^{-(x^2+y^2)}\,dx\,dy$ **6M**

OR

6 **a** Evaluate $\int_1^e\int_1^{\log y}\int_1^{e^x}\log z\,dz\,dx\,dy$ **6M**

b Show that by the double integration, the area between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ is $16a^2/3$ **6M**

UNIT-IV

7 **a** Find the Laplace transform of $3\cos 3t\cos 4t$ **6M**

b Find the Laplace transform of $e^{-3t}(2\cos 5t-3\sin 5t)$ **6M**

OR

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

b Find $L\{F(t)\}$, where $F(t)$ is a periodic function of period 2a and it is given by $F(t)=\begin{cases}k & o<t<a\\ -k & a<t<2a\end{cases}$ **6M**

UNIT-V

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

b Find $L^{-1}\left\{\frac{1}{2}\log\left(\frac{s^2+b^2}{s^2+a^2}\right)\right\}$ **6M**

OR

10 Using Laplace Transform method, solve $\left(D^2+n^2\right)x = a\sin\left(nt+\alpha\right),\ x = Dx = 0$ at $t=0$ **12M**

*** END ***