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

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations Nov/Dec 2019

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 $\left(1+e^{x/y}\right)dx+\left(1-x/y\right)e^{x/y}dy=0$	**6M**
	b	Find the orthogonal trajectories of the family of the parabolas $y^2 = 4ax$. .	**6M**

OR

2	**a**	Solve $(D^2 - 4D+4)y = 8x^2e^{2x} \sin 2x$.	**6M**
	b	Solve $(D^2+a^2)y=\tan ax$ by the method of variation of parameters.	**6M**

UNIT-II

3	**a**	Expand f(x) = Sin-1x in Meclaurins series upto 3 terms.	**6M**
	b	Determine whether the following functions $u=\frac{x+y}{1-xy}$, $V=\tan^{-1}x+\tan^{-1}y$ are functionally dependent or not .If they are functionally dependent, find a relation between them	**6M**

OR

4	**a**	Find the radius of curvature of the curve $x^2y=a(x^2+y^2)$ at (-2a,2a)	**6M**
	b	Find the volume of the largest rectangular parallelepiped that can be inscribed in the ellipsoid $4x^2+4y^2+9z^2=36$	**6M**

UNIT-III

5	**a**	Evaluate $\int_0^1\int_0^1 \frac{dxdy}{\sqrt{1-x^2}\sqrt{1-y^2}}$	**6M**
	b	Change the order of integration $\int_0^1\int_{x^2}^{2-x} xydxdy$ and hence evaluate the double integral.	**6M**

OR

6	**a**	Evaluate $\int_0^{\pi}\int_0^{a\sin\theta} r\,drd\theta$	**6M**
	b	Evaluate $\int_0^1\int_y^1\int_0^{1-x} x\,dzdxdy$	**6M**

UNIT-IV

7	**a**	Find Laplace transform of $f(t)=e^{-3t}\sinh 3t$ using change of scale property.	**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 cos 2t sin 3t.	**6M**
	b	Find the Laplace transform of $f(t)=\left\{\left(t^2-3t+2\right)\sin 3t\right\}$	**6M**

UNIT-V

9 **a** Find by using First shifting theorem, $L^{-1}\left(\frac{3s-2}{s^2-4s+20}\right)$ **6M**

b Using the Convolution Theorem find $L^{-1}\left\{\frac{s}{(s^2+a^2)^2}\right\}$ **6M**

OR

10 Use transform method to solve $y^{11} - 3y^1 + 2y = 4t + e^{3t}$ where $y(0) = 1, y^1(0) = 1.$ **12M**

*** END ***