Q.P. Code: 16HS612 **R16**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B. Tech II Year I Semester Supplementary Examinations June 2019

ENGINEERING MATHEMATICS-III

(Common to All Branches)

Time: 3 hours Max. Marks: 60M

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

UNIT-I

1 **a** Show that the function $f(z)=z+2\bar{z}$ is not analytic anywhere in the complex plane. 5 M

b Find the analytic function $f(z)=u+iv$ whose real part is given by $u=a(1+\cos\theta)$ 7 M

OR

2 **a** Evaluate $\int_0^{3+i} z^2\,dz$ along (i) the line $y=x/3$ (ii) the parabola $x=3y^2$ 6 M

b Evaluate $\int_c \frac{e^{-z}}{z+1}\,dz$, where c is the circle $(i)\,|z|=2$ and $(ii)\,|z|=\frac{1}{2}$ 6 M

UNIT-II

3 Show that $\int_0^{\pi} \frac{1}{a^2+\sin^2\theta}d\theta=\frac{\pi}{a\sqrt{1+a^2}},\,(a>0)$ by using residue theorem. 12 M

OR

4 **a** Find the bilinear transformation which maps the points $(-1,\ 0,\ 1)$ in to the points $(0,\ i,\ 3i)$. 6 M

b Prove that the transformation $w=\sin z$ maps the families of lines into two families of confocal central conics. 6 M

UNIT-III

5 Compute the real root of the equation $x\sin x+\cos x$ by Newton-Raphson method which is near $x=\pi$. 12 M

OR

6 **a** Use Newton's Backward interpolation formula to find $f(32)$ from the following table 6M

x	25	30	35	40
$f(x)$	0.2707	0.3027	0.3386	0.3794

b Using Lagrange's interpolation formula, find the parabola equation passing through the points (0,1), (1,3) and (3,55) 6M

UNIT-IV

7 **a** Fit the equation of the curve $y=ae^{bx}$ to the following data. 7 M

x	1	2	3	4
y	7	11	17	27

b Evaluate $\int_0^4 e^x\,dx$ by Simpson's $\frac{1}{3}$ rule with 10 subdivisions. 5 M

OR

8 **a** Fit the curve of the form $y=a\,b^x$ for the give data 6 M

x	2	3	4	5	6
y	8.3	15.4	33.1	65.2	127.4

b Evaluate $\int_0^1 \sqrt{1+x^3}\,dx$ taking h =0.1 using Trapezoidal rule. 6 M

UNIT-V

9	**a**	Using Taylor's series method to solve the equation $\frac{dy}{dx} = x^2 + y^2$ with $y(0) = 0$ and obtain the value of y when $x = 0.4$.	6 M
	b	Solve $\frac{dy}{dx} = \frac{y - x}{y + x}$ with initial condition $y(0) = 1$ by Picard's method and compute the value of $y(0.1)$.	6 M
		OR	
10	**a**	Solve $\frac{dy}{dx} = \frac{2y}{x}$ with $y(1) = 2$ by Euler's method and compute the value of $y(2)$.	6 M
	b	Apply the fourth order R-K method to find $y(0.1)$ and $y(0.2)$, given $\frac{dy}{dx} = xy + y^2$ with $y(0) = 1$.	6 M

*** END ***