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

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

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

ENGINEERING MATHEMATICS-III

(Common to all Branches)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1	**a**	If $f(z)=u+iv$ is an analytic function of z and if $u-v=e^x(\sin x-\cos y)$. Find $f(z)$ in terms of z.	**L3**	**6M**
	b	Find the analytic function whose real part is $e^x(x\sin y+y\cos y)$	**L3**	**6M**

OR

2	**a**	Evaluate $\int_C \frac{\sin^2 z}{\left(z-\frac{\pi}{6}\right)^3}dz$ where $C:\lvert z\rvert=1$	**L5**	**6M**
	b	Evaluate $\int_C \frac{\log z}{(z-1)^3}dz$ where $C:\lvert z-1\rvert=\frac{1}{2}$ using Cauchy Integral formula	**L5**	**6M**

UNIT-II

3	**a**	Find the poles of the function $f(z)=\frac{z^2+1}{z^2-2z}$ and the residues at each pole	**L3**	**6M**
	b	Find the poles and residues of tan h z	**L3**	**6M**

OR

4	**a**	Find the bilinear transformation which maps the point's $(\infty,i,0)$ in to the points $(0,i,\infty)$	**L3**	**6M**
	b	Find the bilinear transformation that maps the point's $(0,1,i)$ in to the points $(1+i,-i,2-i)$ in w-plane	**L3**	**6M**

UNIT-III

5		Find a real root of the equation $xe^x-\cos x=0$ using Newton- Raphson method.	**L3**	**12M**

OR

6		Find a positive root of $x^3-x-1=0$ correct to two decimal places by bisection method.	**L3**	**12M**

UNIT-IV

7		Fit the curve of the form $y=ae^{bx}$ to the following data	**L3**	**12M**

x	0	1	2	3	4	5	6	7	8
y	20	30	52	77	135	211	326	550	1052

OR

8 Evaluate $\int_0^1 \frac{1}{1+x}dx$ **L5** **12M**

(i) by Trapezoidal rule and Simpson's $\frac{1}{3}$rd rule.

(ii) (ii) Using Simpson's $\frac{3}{8}$th rule and compare the result with actual value.

UNIT-V

9 Using Taylor's series method find an approximate value of y at $x=0.2$ for the differential equation $y'-2y=3e^x$, $y(0)=0$. Compare the numerical solution obtained with exact solution. **L3** **12M**

OR

10 Using R-K method 4th order find $y(0.1)$, $y(0.2)$ and $y(0.3)$ given that **L3** **12M**

$\frac{dy}{dx}=1+xy, y(0)=2$

*** END ***