

I B. Tech I Semester Supplementary Examinations, July/August - 2021
MATHEMATICS-II (NM&CV)
(Com to ECE, EIE, ECom E)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. Answer **ALL** the question in **Part-A**
 3. Answer any **FOUR** Questions from **Part-B**

PART -A

1. a) Write the condition for the convergence of iterative method. (2M)
- b) Define Shift operator. (2M)
- c) Evaluate $\int_0^{\pi} \frac{dx}{1+x}$ using Trapezoidal Rule . (2M)
- d) Is the function $f(z) = x + iy$ analytic ? (2M)
- e) State Cauchy's integral theorem. (2M)
- f) Find the poles of $f(z) = \frac{z+1}{z(z-1)}$. (2M)
- g) Define removable singularity. (2M)

PART -B

2. a) Solve $3x = 1 + \sin x$ by iteration method . (7M)
- b) Solve $x^2 = 12$ by bisection method. (7M)

3. a) Find $y(3.5)$ using Newton's Backward difference formula from the table

X	1	2	3	4
Y	349	482	591	655

- b) Find the $y(4)$ from the following data (7M)

x	1	2	5	6
y	2	3	6	14

4. a) Find the solution of $\frac{dy}{dx} = \frac{x-y}{x+y}$, $y(0)=1$ at $x=0.5, 0.6$ using Taylor's series method (7M)
- b) Find the solution of $\frac{dy}{dx} = x^2 + y^2$, $y(1)=1$ at $x=1.5$ using modified Euler's method. (7M)

5. a) Find the harmonic conjugate of $x^2 - y^2 + xy$. (7M)

b) Show that $f(z) = \begin{cases} \frac{x^2 y^5 (x + iy)}{x^4 + y^{10}}, & z \neq 0 \\ 0 & , z = 0 \end{cases}$ (7M)

is not analytic at $z = 0$ although C-R equations are satisfied at origin.

6. a) Evaluate $\int_0^{3+i} z^2 dz$ along the line $y = \frac{x}{3}$. (7M)

b) Expand $f(z) = \frac{1}{z(z^2 - 3z + 2)}$ in $0 < |z| < 1$ using Laurent's series. (7M)

7. a) Evaluate $\int_0^{\infty} \frac{\sin mx}{(x-a)} dx$ (7M)

b) Evaluate $\oint_C \frac{1+z}{z(2-z)} dz$ Where $C: |z| = 1$ using Cauchy's Residue theorem. (7M)