

I B. Tech I Semester Supplementary Examinations, December - 2021
MATHEMATICS-II (NM&CV)
(Com to ECE, EIE, E Com 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 Newton Raphson formula to find the root of an equation. (2M)
- b) Define average operator. (2M)
- c) Evaluate $\int_0^1 \frac{dx}{1+x}$ using Trapezoidal Rule. (2M)
- d) Find $\lim_{z \rightarrow 0} \frac{(x^2 + y^2)}{x + y}$. (2M)
- e) Prove that $f(z) = z^2$ is analytic. (2M)
- f) Define isolated singularity and given an example. (2M)
- g) Find the residue of $e^{\frac{1}{z}}$ at $z = 0$ (2M)

PART -B

2. a) Solve $e^{-x} = x$ by Bisection method . (7M)
- b) Solve $x \log_{10} x = 1.2$ by False position method. (7M)
3. a) Find $y(1.1)$ using Newton Forward difference formula from the table (7M)

X	1	1.2	1.4	1.6
Y	3.49	4.82	5.91	6.5

- b) Find the $y(3)$ from the following data (7M)

x	0	1	2	4
y	2	3	12	14
4. a) Find the solution of $\frac{dy}{dx} = x + y$, $y(0)=1$ at $x=0.1$ using Picard's method (7M)
- b) Find the solution of $\frac{dy}{dx} = x^2 + y$, $y(0)=1$ at $x=0.1$ using Runge-Kutta method of fourth order . (7M)
5. a) Find the analytic function $f(z) = u + iv$ where $v(x, y) = e^x \cos y$. (7M)
- b) Show that $f(z) = \sqrt{|xy|}$ is not analytic at $z = 0$ although the C-R equations are satisfied at the origin. (7M)

6. a) Evaluate $\int_{(1,1)}^{(2,4)} (x^2 + ixy) dz$ along the curve $x = t, y = t^2$. (7M)
- b) Evaluate $\int_c \frac{ze^z}{(z-a)^3} dz$ where 'a' lies within a closed curve by Cauchy integral formula. (7M)
7. a) Evaluate $\oint_c \frac{2e^z}{z(z-3)} dz$ Where $c : |z| = 2$ by Residue theorem. (7M)
- b) Show by the method of Contour integration Evaluate $\int_0^{\infty} \frac{\cos mx}{(x-a)} dx$ (7M)