Code No: R161110 **R16** SET - 1

I B. Tech I Semester Supplementary Examinations, April - 2022
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**

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PART –A

1. a) Find two approximations of $f(x) = x^3 - x^2 + 1 = 0$ using False position method (2M)

b) Prove that $E = \Delta - 1$ (2M)

c) Evaluate y(0.1) for $\frac{dy}{dx} = xy + 1, y(0) = 1$ using Euler's method (2M)

d) Is the function $f(z) = xy + iy$ is analytic (2M)

e) Define Radius of convergence (2M)

f) Find the Poles f(z) = $tanz$ (2M)

g) Identify the singularity of $e^{\frac{1}{z}}$ at z = 0 (2M)

PART –B

2. a) Solve $x = cosx$ by iteration method (7M)

b) Solve $x^2 - 2x + 5 = 0$ by bisection method (7M)

3. a) Find y(1.5) using Newton's forward difference formula from the table (7M)

X	1	2	3	4
Y	200	222	325	460

b) Find the polynomial from the following data using Lagrange's interpolation formula (7M)

x	1	2	4	7
y	1	2	4	6
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4. a) Find the solution of $y' = x^2 - y$, y(1)=1at x=1.5, 2.0 using Taylor's series method (7M)

   b) Find the solution of $\frac{dy}{dx} = 3x + y^2, y(0) = 1$, at x=0.5 using RK method of second order method. (7M)

5. a) Construct analytical function whose real part is $u = x^2 - y^2 - y$ (7M)

   b) Define analyticity of a complex function at a point P and in a domain D. Prove that the real and imaginary parts of an analytic function satisfy Cauchy – Riemann Equations. (7M)

6. a) Evaluate $\int_c \left[\frac{e^z}{z^3} + \frac{z^4}{(z+i)^2}\right] dz$ where c: $|z| = 2$ using Cauchy's integral formula (7M)

   b) Expand $\frac{1}{(z^2 - 3z + 2)}$ in the region (i) 0 < | z – 1 | < 1 (ii) 1 < | z | < 2 using Laurent's series (7M)

7. a) Show that $\int_0^{2\pi} \frac{d\theta}{2 + Cos\theta} = \frac{2\pi}{\sqrt{3}}$ (7M)

   b) Evaluate $\oint \frac{zdz}{(z-1)^2}$ Where c :|z| = 2 using Cauchy's Residue theorem (7M)