

I B. Tech I Semester Supplementary Examinations, May/June - 2019
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. Answering the question in **Part-A** is Compulsory
 3. Answer any **FOUR** Questions from **Part-B**
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PART -A

1. a) Show that $f(z) = |z|^2$ is not analytic at any point. (2M)
- b) Evaluate $\int_0^{1+i} (x^2 + iy) dz$ along the paths (i) $y = x$ (2M)
- c) Classify the Singularity of $f(z) = \operatorname{Cosec} z$ at $z = 0$ (2M)
- d) Find the Residue of $f(z) = \frac{z}{(z+1)(z-2)}$ at $z = -1$ (2M)
- e) Write the merits of modified Euler's method. (2M)
- f) Write relation between E and δ . (2M)
- g) What is quadratic convergence? (2M)

PART -B

2. a) Find analytic function whose Real part $u(x, y) = x^3 - 3xy^2 + 3x^2 - 3y^2 + 2x + 1$ (7M)
- b) Show that a analytic function $f(z) = u + iv$ form an Orthogonal system. (7M)
3. a) find the Laurent's series of $f(z) = \frac{z^2-1}{(z+2)(z+3)}$ for (7M)
 - (i) $|z| > 3$ (ii) $2 < |z| < 3$
- b) Evaluate $\int_C \frac{e^{2z}}{(z-1)(z-2)} dz$ where $C: |z| = 3$ using Cauchy's integral formula. (7M)
4. a) Evaluate $\oint_C \frac{1+z}{z(2-z)} dz$ Where $c: |z| = 1$ using residue theorem. (7M)
- b) Evaluate $\int_0^\infty \frac{\sin mx}{x(x^2+a^2)} dx$ using residue theorem. (7M)
5. a) By Taylor's method find $y(0.4)$ given that $\frac{dy}{dx} = 3x + y^2, y(0) = 1$ (7M)
- b) Apply RK method of fourth order to find $y(1.2)$ given that $y' = x^2 + y^2, y(1) = 1.5$ (7M)

6. a) Interpolate by means of Newton backward formula, the population of a town for the year 1985, given that. (7M)

year	1939	1949	1959	1969	1979	1989
population	12	15	20	27	39	52

- b) Evaluate $y(7)$ from the following table. (7M)

X	1	3	5	6	8
Y	2	1.5	2.4	4	5.6

7. a) Find the Real root of $x + \log_{10} x - 2 = 0$ using Newton Raphson method. (7M)
- b) Find the Real root of $\tan x = x$ using False position method. (7M)