R16

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) = Cosec z at z = 0   (2M)

   d) Find the Residue of $f(z) = \dfrac{z}{(z+1)(z-2)}$ 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) = $\dfrac{z^2-1}{(z+2)(z+3)}$ for   (7M)

   (i) $|z| > 3$ *(ii)* $2 < |z| < 3$

   b) Evaluate $\int_c \dfrac{e^{2z}}{(z-1)\,(z-2)}$ dz where C: $|z| = 3$ using Cauchy's integral formula.   (7M)

4. a) Evaluate $\oint_C \dfrac{1+z}{z(2-z)}$dz Where c :|z| = 1 using residue theorem.   (7M)

   b) Evaluate $\int_0^\infty \dfrac{\sin mx}{x(x^2 + a^2)} dx$ using residue theorem.   (7M)

5. a) By Taylor's method find y(0.4) given that $\dfrac{dy}{dx} = 3x + y^2, y(0) = 1$ (7M)

   b) Apply RK method of fourth order to find y(1.2) given that $y^1 = x^2 + y^2$,y(1)= 1.5   (7M)

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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 tanx = x using False position method.   (7M)

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