Total No. of Pages : 02
(Sem.–1) 5 18
Max. Marks : 70
lestions carrying TWO marks

- 3. Attempt any FOUR questions from SECTION B & C carrying FIFTEEN marks
- each. 4. Select atleast TWO questions from SECTION - B & C each.

## SECTION-A

- Show that the function  $f \Box \Box \frac{xy^3}{x2\Box y^6} \Box \Box 0 \Box f \Box \Box inot continuous at origin.$ 1.
- 2. State Fundamental theorem of algebra and Liouville's theorem.
- What is radius of convergence? Find radius of comvergence of 113 3.
- State Cauchy's Residue theorem and Argument principle. 4.
- 5. Define conformal transformations, critical points and Fixed points.

## SECTION-B

- a) Show that the function u = x3 3xy2 is harmonic and find its harmonic conjugate. Also 6. determine the corresponding analytic function f(z) in terms of z.
  - b) Show that cos[iz[1]cos[iz] for all z and find all values of z for which sin@iz00sin0iz.0

- 7. a) Derive Cauchy's integral formula.
  - b) Applying Cauchy integral formula, calculate

|z020z0206

8. State and prove Morera's theorem.

## SECTION-C

 $e^{az}$  dz, where C is the ellipse

- 9. State and prove Laurent theorem.
- 10. Prove that  $\int_{0}^{\Box} \frac{\sin x}{x \exp a 2} \frac{\Box}{2a2} \int_{0}^{\Box} e^{\Box a} \Box a \Box 0.$
- 11. a) Find the bilinear transformation which transforms the half plane Re(z)000 into the unit circle | w | 001.
  - b) Find the general bilinear transformation which transform the circular disc. | z |  $\Box\Box\Box$  onto the circular disc | w |  $\Box\Box\Box$ '

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.