Course Code: 1MSCM4
Course: Complex Analysis-I
Credit: 4
Last Submission Date: April 30 (for January Session)
October 31, (for July session)

Max. Marks:-70
Min. Marks:-25

Note:-attempt all questions.

Que.1 Construct the analytic function f (z) = u + iv of which the real part is

$u = e^{x}$ (xcosy- ysiny)

Que.2 State & prove Couchy – Riemann Equations.

Que.3 Find the bilinear transformation which maps the points

$Z_1 = 2$, $Z_2 = i$, $Z_3 = -2$ into the

Points $w_1 = 1$, $w_2 = i$ and $w_3 = -1$

Que.4 Let f (z) be an analytic function of z in a domain D of the Z – plane and let f' (z) ≠ 0 inside D . Then the mapping w = f (z) is conformal at all points of D.

Que.5 Let f (z) be a regular (analytic) function and let f'(z) be continues at each point within and on a closed contour c. Then

$$\int_c f(z)dz = 0$$

Que.6 Let f (z) be analytic in the multiply connected region D bounded by the closed contour c and the two interior contours c_1, c_2 then

$$\int_c f(z) = \int_{c_1} f(z) + \int_{c_2} f(z)\mathrm{dz}$$

Que.7 State and prove Cauchy integral formula.

Que.8 State and prove Morea's theorem.

Que.9 State & prove Taylor's theorem and also gives example related with it.

Que.10 Let f (z) = $\frac{2z^3+1}{z^2+z}$, then find

(1) a Taylor' s series valid in the neighbourhood of the point z = i
(2) a Laurent's series valid within the annulus of which centre in the origin.