Subject: Applied Maths-III

Date :

Class: S.E

Semester: III

Marks : 20

Duration : 1 Hr

Branch : MECH

Test : I

Solve any **four** questions   (5 marks each)

1. Find the constants a, b, c, d if

   $f(Z) = (x^2 + 2ax + by^2) + i(cx^2 + 2dxy + y^2)$ is analytic.

2. Evaluate $\int f(z)dz$ along the parabola $y = 2x^2$ from $z = 0$ to $z = 3 + 18i$,

   where $f(z) = x^2 - 2iy$

3. Evaluate $\int\limits_{C} \dfrac{3z^2 + z}{(z^2 - 1)}\, dz$, where C is the circle $|z| = 2$

4. Find Laurent's series which represents the function $f(z) = \dfrac{2}{(z-1)(z-2)}$ when

   $1 < |z| < 2$

5. Evaluate $\int_0^{2\pi} \dfrac{d\theta}{5 + 3\sin\theta}$

6. Find the bilinear transformation which maps the points $z = 0, 1, \infty$ onto the points $w = -5, -1, 3$