St. Joseph's College of Engineering, Chennai – 119.

St. Joseph's Institute of Technology, Chennai – 119.

Department of Mathematics

MA6351-Transforms and Partial Differential Equations

Assignment – V

UNIT I PARTIAL DIFFERENTIAL EQUATIONS

YEAR-II   (Common to all Branches)   Semester III

PART – A

1. Obtain the partial differential equation by eliminating arbitrary constants 'a' & ' b' from $(x-a)^2 + (y-b)^2 + z^2 = 1$.

2. Form the partial differential equation by eliminating ' g ' from $g(x^2 + y^2 + z^2, x + y + z) = 0$.

3. Eliminate the arbitrary function ' f ' from $z = f\left(\dfrac{y}{x}\right)$ and form the PDE.

4. Find the singular integral of $z = px + qy + 2\sqrt{pq}$

5. Solve $p(1+q) = qz$.

6. Solve $yp = 2xy + \log q$

7. Solve $\left(D^3 - 3DD'^2 + 2D'^3\right)Z = 0$.

8. Find the Particular Integral $\dfrac{\partial^2 z}{\partial x^2} - 2\dfrac{\partial^2 z}{\partial x \partial y} + \dfrac{\partial^2 z}{\partial y^2} = \sin(2x + 3y)$

PART – B

1. a Find the singular solution of the equation $z = px + qy + \sqrt{1 + p^2 + q^2}$

   b Solve $(D^2 + DD' - 6D'^2)z = x^2 y + y \cos x$

2. a Find the general solution of $x(y^2 - z^2)p + y(z^2 - x^2)q = z(x^2 - y^2)$

   b Solve $(2D^2 - 5DD' + 2D'^2)\, z = 5\sin(2x + y) + e^{y-x}$

3. a Solve $z^2(p^2 + q^2) = x^2 + y^2$

   b Solve $(D^2 - D'^2 - 3D + 3D')\, z = e^{3x+2y} + \sin(x + 2y)$

4. a Solve $z^2 = 1 + p^2 + q^2$

   b Solve $(x^2 - yz)p + (y^2 - zx)q = (z^2 - xy)$