

## ASSIGNMENT - 1

Q1: Form the PDE by eliminating the arbitrary constants  $a, b$  from the following

(i)  $\log z = a \log x + \sqrt{1-a^2} \log y + b$

(ii)  $4z(1+a^2) = (x+ay+b)^2$

Q2: Find PDE of all right circular cones whose axis coincides with the  $z$ -axis.

Q3: Form the PDE by eliminating arbitrary functions in the following

(i)  $z = (x+y) \phi(x^2-y^2)$

(ii)  $\phi\left(\frac{1}{x}-\frac{1}{y}, \frac{1}{y}-\frac{1}{z}\right)$

(iii)  $f(x^3-y^3, x^2-z^2)$

(iv)  $z = f(2x+3y) + g(3x-y)$

Q4: Find the complete soln and singular soln for the PDEs:

(i)  $z = px + qy - 2\sqrt{pq}$

(ii)  $z = px + qy + \log(pq)$

(iii)  $pq = x$

Q5: (a) Find general soln by Lagrange's method of the PDE  $y^2 zp + x^2 zq = xy^2$

(b) solve  $(D^2 - D_1^2)z = e^{x+y}$