PARTIAL DIFFERENTIAL EQUATIONS

1. A differential eqⁿ containing one or more partial derivatives is called a PDE.

2. Partial differentiation occurs only when are at least two independents variables.

$$z = f(x, y)$$

Eg $z = x^2y$ $\quad \frac{\partial z}{\partial x} = 2xy \quad \frac{\partial z}{\partial y} = x^2$

3. The order of a PDE is the order of the highest order partial derivative present in the equation.

order 1. $x\frac{\partial z}{\partial x} + y\frac{\partial z}{\partial y} = 0$

$$\left(\frac{\partial z}{\partial x}\right)^2 + \left(\frac{\partial z}{\partial y}\right) = 0$$

order 2:- $\frac{\partial^2 z}{\partial t^2} = k^2\left(\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2}\right)$

4.) The degree of a PDE is the power of the highest order partial derivative present in the eqⁿ.

5.) Partial derivatives $\frac{\partial z}{\partial x}$, $\frac{\partial z}{\partial y}$, $\frac{\partial^2 z}{\partial x^2}$,

$\frac{\partial^2 z}{\partial x \partial y}$, $\frac{\partial^2 z}{\partial y^2}$ are denoted by $p, q, r,$

s, t respectively.

— × —