

Nabadwip Vidyasagar College
Department of Mathematics
Semester-V

CC-11 (Partial Differential Equations & Applications)
1st Unit Test 2022

F.M: 20

Time: 50 Min

A. Answer any five questions

$2 \times 5 = 10$

1. Define order and Degree of a Partial Differential Equation with example.
2. Find the PDE describing the set of all right circular cone whose axis coincides with z axis.
3. Eliminate the arbitrary function and form the PDE from $z = xy + f(x^2 + y^2)$.
4. Solve the PDE $zp = -x$.
5. Eliminate a,b from the equation $z = ax + by + ab$.
6. Solve the PDE $x^2p + y^2q = z^2$.

B. Answer any two questions.

$5 \times 2 = 10$

1. Solve the linear PDE $py + qx = xyz^2(x^2 - y^2)$ by Lagrange's Method.
2. Find the integral surface of the linear partial differential equation $4yzp + q + 2y = 0$ passing through the curve $x + z = 2, y^2 + z^2 = 1$.
3. Reduce the first order linear PDE $z_x - z_y = z$ into canonical form and hence find its general integral.
4. Solve the PDE $4u_x + u_y = 3u$, given $u(0, y) = 3e^{-y} - e^{-5y}$ by the method of Separation of Variable.