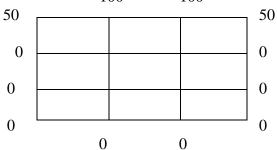
## SRM Institute of Science and Technology Department of Mathematics

## 21MAB206T- Numerical Methods and Analysis

## $\begin{tabular}{ll} \textbf{Unit $V$: - Numerical Solution of Partial Differential Equations}\\ \textbf{Tutorial Sheet} - \textbf{I} \end{tabular}$

- 1. Classify the partial differential equation  $xf_{xx} + yf_{yy} = 0, x > 0, y > 0$
- 2. Classify the partial differential equation  $x^2 f_{xx} + (1 y^2) f_{yy} = 0$
- 3. Solve  $\nabla^2 u = 0$  at the nodal points for the following square region given the boundary condition 100 100



4. Solve  $\nabla^2 u = 0$  for the square region with the given boundary conditions

	20		30		
	20	$u_1$		u2	40
	30	u3		u4	50
40 50					

5. By Iteration method, solve the Laplace equation  $u_{xx} + u_{yy} = 0$ , over the square region, satisfying the boundary conditions.

$$u(0, y) = 0.0 \le y \le 3$$

$$u(3, y) = 9 + y, 0 \le y \le 3$$

$$u(x,0)=3x,0\leq x\leq 3$$

$$u(x,3) = 4x, 0 \le y \le 3$$