Assignment 9

Advanced Mathematical Techniques in Chemical Engineering (CH 61015)

Full Marks: 30

Solve the following PDEs using Green's function method

1.

$$\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2} + t$$

At t=0, u=1, at x=0, $\frac{\partial u}{\partial x} = 1$, at x=1, u=0

2.

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = xy$$

At x=0, $\frac{\partial u}{\partial x} = 1$, at x=1, u=0; at y=0, u=2 and at y=1, $\frac{\partial u}{\partial y} + y = 0$

3. $\frac{\partial^2 u}{\partial t^2} + \frac{\partial^2 u}{\partial x^2} = t$

At t=0, $\frac{\partial u}{\partial t} = 1$ and u=2, at x=0, $\frac{\partial u}{\partial x} = 0$; at x=1, u=0