SNS COLLEGE OF ENGINEERING

Coimbatore – 641 107

UNIT – III APPLICATION OF PARTIAL DIFFERENTIAL EQUATIONS

TUTORIAL 3

1. A uniform rod of length 50 cm with insulated sides is initially at a uniform temperature 100^0c.Its ends are kept at 0^0c.Find the temperature distribution.

2. A rod of 30cm long has its ends A & B at 20^0C and 80^0C respectively until steady state conditions prevail. The temperature at the end B is then suddenly reduced to 60^0C and at the end at A is raised to 40^0C and maintained so. Find the resulting temperature U(x, t).

3. A rod of length *l* has its ends A & B kept at 0^0c & 100^0c respectively, until steady state conditions prevail. If the temperature at B is reduced to 0^0c and kept so, while that of A is maintained, Find the temperature u(x,t) at a distance x from A at time t.

4. A metal bar 10 cm long with insulated sides has its ends A and B kept at $20^0 c$ & $40^0 c$ respectively until steady state conditions prevail. The temperature at A is then suddenly raised to $50^0 c$ and at the same instant that at B is lowered to $10^0 c$ .find the subsequent temperature at any point at the bar at any time.