



# SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

AN AUTONOMOUS INSTITUTION



Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

## TUTORIAL

### One-D heat equation by explicit method (Bender Schmidt):

1. Solve  $u_{xx}=32u_t, t \geq 0, 0 < x < 1, u(0,t)=0, u(x,0)=0, u(1,t)=t. h=0.25$
2. Solve by Bender –Schmidt formula up to  $t=5$  for the equation  $u_{xx}=u_t$ , subject to  $u(0,t) = 0, u(5,t)=0$  and  $u(x,0)=x^2(25-x^2)$ , taking  $h=1$ .
3. Using Bender-Schmidt's method solve  $\frac{\partial^2 u}{\partial x^2} = \frac{\partial u}{\partial t}$ , given  $U(0,t)=0, u(1,t)=0, u(x,0) = \sin \pi x, 0 < x < 1$  and  $h=0.2$ , Find the  $u$  upto  $t=0.1$ .
4. Solve  $\frac{\partial u}{\partial t} = \frac{1}{2} \frac{\partial^2 u}{\partial x^2}$  with the condition  $u(0,t)=0=U(4,t), U(x,0)=x(4-x)$  Taking  $h=1$  employing Bender-Schmidt recurrence equation. Continue through 10 time steps.