(Please write your Enrolment No. immediately) Enrolment No. 147

CLASS TEST

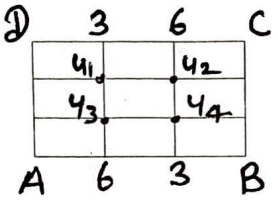
Third Semester, Dec. 2023

Paper Code: ES- 201 **Subject: Computational Methods**

Time: 1 Hrs. **Max. Marks ; 30**

Note : Attempt Q.No. 1 Which is compulsory and any two more questions from remaining.

Q1. (a) Find u_1, u_2, u_3 *and* u_4 *initially* for $u_{xx} + u_{yy} = 0$ with the help of the figure. (3) CO4



(b) Solve the system of equation by Gauss elimination method

$2x - y + 3z = 9, x + y + z = 6, x - y + z = 2$ (4) CO3

(c) Given $\frac{dy}{dx} = \frac{y - x}{y + x}$, with the initial condition y=1 at x=0. Find y for x=0.1 and x=0.2 (3) CO4
Using Euler's method.

Q2. Solve the following system of equation by Cholesky's method (10) CO3

$x + y + 3z = 6, x + 5y + 5z = 20, 3x + 5y + 19z = 106$

Q3. By using Runge- Kutta fourth order method to find y for x=0.1 in step of $h = 0.1$ if $\frac{dy}{dx} = x + y^2$, Given that $y(0) = 1$. (10) CO4

Q4. Find the value of $u(x,t)$ satisfying the parabolic equation $\frac{\partial u}{\partial t} = 4\frac{\partial^2 u}{\partial x^2}$ and the boundary conditions $u(0,t) = 0$, $u(8,t) = 0$, and $u(x,0) = 4x - \frac{1}{2}x^2$ at the points $x = i; i = 0,1,2,3,4$ .... and $t = \frac{1}{8}j$: $j = 0,1,2,3,4,5$. (10) CO4