

Please check whether you have got the right question paper.

- N.B:
1. Question No. 1 is compulsory.
 2. Solve any **three** questions out of remaining **five** question.
 3. Assume suitable data if required

- Q.1 a) Give short note on scilab also explain for, while and do loops. 10
 b) Solve by Gauss Jordan method $x + y + z = 5$ 10
 $2x + 3y + 5z = 8$
 $4x + 5z = 2$
- Q.2 a) Find y (2.1) using eulers method from equation $dy/dx = -xy^2$ with $y(2) = 1$ 10
 b) Solve by regula falsi method, $x^3 - 3x + 1$, in the interval $[1,2]$ correct upto 3 decimal 10
 places.
- Q.3 a) What is the condition to apply Adam Bashforth method. 05
 b) Use the Crank-Nicolson method to solve the partial differential equation. 15
 $\frac{\partial T}{\partial t} = 0.02 \frac{\partial^2 T}{\partial x^2}$ with the following initial and boundary conditions:
 Initial conditions : $T(x,0) = 100x$ for $0 \leq x \leq 1$; $T(x, 0) = 100(2-x)$ for $1 \leq x \leq 2$ Boundary
 conditions :
 $T(0,t) = 0$; $T(2,t) = 0$
- Q.4 a) Solve by using secant method : $x^3 - x - 1$ correct up to 4 decimal places. 10
 b) Use Newton's Method to find the only real root of the equation $x^3 - x - 1 = 0$ correct to 10
 5 decimal places.
- Q.5 a) Explain in detail method of Line. 10
 b) What is mean by ordinary and partial differential equation give one example each. 05
 c) State the convergence of gauss siedal method. 05
- Q.6 a) Use Runge - Kutta Method of Order 4 to solve the following, using a step size 10
 $h = 0.1$, for $0 \leq X \leq 1$.
 $dx/dy = 5x^2 - y/e^{x+y}$
 $y(0) = 1$
 b) Find the solution of difference Equation $U_{n+1} = \frac{1}{2U_n + 1}$ 10
