

D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1**SEMESTER EXAMINATIONS****NOVEMBER – 2016****SMA5A****NUMERICAL METHODS****Time : 2 Hours****Max. Marks : 50****SECTION - A (10 x 2 = 20)****Answer ALL the questions.**

1. Write the iterative formula for Regula Falsi method.
2. State the condition for convergence for iteration method.
3. Form the divided difference table for the following data.

x	1	2	7	8
$f(x)$	1	5	5	4

 4.Using Lagrange's formula of interpolation find $y(1.5)$ given

x	0	1	2
y	0	1	20

5. Write the formula for $\frac{dy}{dx}$ at $x = x_n$ using backward difference operator.
6. What is the error in Trapezoidal rule?
7. State a sufficient condition for Gauss – Jacobi method for convergence.
8. Distinguish between direct and iterative method for solving simultaneous equations.
9. State the second order Runge - Kutta formula for first order ODE.
10. Compute y at $x = 0.25$ by Modified Euler method given $y' = 2xy$, $y(0) = 1$.

SECTION - B (3 x 10 = 30)**Answer any THREE of the following questions.**

11. Find an iterative formula to find \sqrt{N} (where N is a positive number) and hence find $\sqrt{5}$.
12. From the following table of half – yearly premium for policies maturing at different ages, estimate the premium for policies maturing at age 46 and 63.

Age x	45	50	55	60	65
Premium y	114.84	96.16	83.32	74.48	68.48

13. Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by i) Trapezoidal rule ii) Simpson's rule. Also check up the results by actual integration.

14. Solve the following system by Gauss – Seidal method.

$$10x - 5y - 2z = 3$$

$$4x - 10y + 3z = -3$$

$$x + 6y + 10z = -3.$$

15. Using Taylor method, compute $y(0.2)$ and $y(0.4)$ correct to 4 decimal places given $\frac{dy}{dx} = 1 - 2xy$ and $y(0) = 0$.