| UG–423 | BCA–12 |

U.G. DEGREE EXAMINATION — JANUARY, 2009.

(AY 2004–05 batch onwards)

Second Year

B.C.A.

COMPUTER ORIENTED NUMERICAL METHODS

Time : 3 hours　　　　　　　　Maximum marks : 75

Answer for 5 marks question should not exceed
2 pages.

Answer for 10 marks questions should not exceed
5 pages.

PART A — (5 × 5 = 25 marks)

Answer any FIVE questions.

1.　Find a real root of the equation $x^3 - 3x + 1 = 0$ lying between 1 and 2 correct to three places of decimal by using Bisection method.

2.　Define Interpolation, Extrapolation.

3.　Define Errors in Numerical applications.

4.　Explain Simpson's rule.

5. Explain Lagrange Interpolation method.

6. Discuss about System of Linear equations.

7. Explain the Iterative methods.

PART B — $(5 \times 10 = 50$ marks)

Answer any FIVE questions.

8. Solve $2x + y = 3$, $2x + 3y = 5$ by Gauss Seidal method.

9. (a) Solve the following system of simultaneous equations by Newton Raphson Method.

$$x^2 + 3x - y = 0$$
$$xy + 3y + 9 = 0$$

with $x_0 = -4$, $y_0 = -6$.

(b) Derive Gauss Elimination method.

10. Evaluate $\int_0^{10} \dfrac{dx}{1 + x^2}$ by using Trapezoidal and Simpson's rule.

11. (a) Use the method of iteration to fine the real root lying between 1 and 2 of the equation $x^3 - 3x + 1 = 0$.

(b) Explain about Partial Pivoting.

2 **UG–423**

12. (a) Explain Bisection method.

(b) Use Lagrange's interpolation formula to fit a polynomial to the data

X :	0	1	3	4
Y :	– 12	0	6	12

Find the value of y when $x = 2$.

13. (a) Solve $\dfrac{dy}{dx} = 1 - y,\ y(0) = 0$ using Euler's method. Find y at $x = 0.1$ and $x = 0.2$. Compare the result with results of the exact solution.

(b) Find by Regula-Falsi method, the positive root of $x^2 - \log_{10} x - 12 = 0$.

14. Fit a curve of the form $y = ax^b + c$ to the following data using the group average method

X :	2	3	4	5	6	7	8	9
Y :	1 8	3 3	5 2	8 0	11 2	15 3	19 7	24 8

——————

3   **UG–423**