

# MARWARI COLLEGE RANCHI

Subject : Scientific Computing

Full Marks : 30

Paper : III

Time : 1Hr.

## MCA SEMESTER 1

### Mid semester examination 2017

#### Use of calculator is allowed in the Exam

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1. Write the correct answer: 2 x 5 = 10
- a. Newton Raphson method has ..... Order convergence.
    - i. First
    - ii. Second
    - iii. Third
    - iv. None of these
  - b.  $Ax^3 + bx + c = 0$  is a ..... Equation.
    - i. Polynomial
    - ii. Quadratic
    - iii. Cubic
    - iv. None of these
  - c. In the Regula Falsi method of finding the real root of an equation, the curve AB is replaced by:
    - i. Mid-point
    - ii. Tangent
    - iii. Chord
    - iv. None of these
  - d. A non-algebraic function  $f(x) = xsinx + \log x$  is called.
    - i. Polynomial
    - ii. Quadratic
    - iii. Transcendental
    - iv. None of these
  - e. .... Formula is used to find a tabulated value near the beginning of the table.
    - i. Newton Raphson
    - ii. Newton Forward Difference
    - iii. Newton Backward difference
    - iv. Lagrange's Interpolation

2. Answer any **TWO** questions:

5 x 2 = 10

- a. Find the roots of equation  $x^3 - x + 4 = 0$  using bisection method correct to two decimal places.
- b. What do you mean by Interpolation? Write the Newton's backward Difference Interpolation formula.
- c. If  $u_0 = 3$ ,  $u_1 = 12$ ,  $u_2 = 81$ ,  $u_3 = 2000$ ,  $u_4 = 100$  calculate  $\Delta^4 u_0$

3. Answer any **ONE** question:

10 x 1 = 10

- a. Using Newton Raphson method, find the root of equation  $X^3 - 3x + 1 = 0$
- b. Solve the following equations by Gauss Elimination method.  
 $2x + y + z = 10$   
 $3x + 2y + 3z = 18$   
 $X + 4y + 9z = 16$