

MARWARI COLLEGE RANCHI

Subject : Scientific Computing

Full Marks : 30

Paper : III

Time : 1Hr.

MCA SEMESTER 1

Mid semester examination 2016

1. Write the correct answer:

2 x 5 = 10

- a. $2^0 =$
 - i. 0
 - ii. 1
 - iii. -1
 - iv. None of these
- b. $ax^2 + bx + c = 0$ is a Equation.
 - i. Polynomial
 - ii. Quadratic
 - iii. Cubic
 - iv. None of these
- c. Algebraic functions of the form
 $f_n(x) = a_0x + a_1x^{n-1} + a_2x^{n-2} + \dots + a^n$
Are called
 - i. Polynomial
 - ii. Quadratic
 - iii. Cubic
 - iv. None of these
- d. A non-algebraic function $f(x) = \sin^2x - x^2 - 2$ is called
 - i. Polynomial
 - ii. Quadratic
 - iii. Transcendental
 - iv. None of these
- e. Method is used to improve the result obtained by Bisection method or Regula falsi method.
 - i. Newton Raphson method
 - ii. Newton Forward Difference
 - iii. Newton Backward Difference
 - iv. Lagrange's Interpolation

2. Answer any **TWO** questions:

5 x 2 = 10

- a. Compute the forward difference table for the following data
 $y(1) = 24$ $y(3) = 120$ $y(5) = 336$ and $y(7) = 720$
- b. Compute the table of difference for the function $f(x) = x^2 + 5x - 7$ for $x = -1, 0, 1, 2, 3, 4, 5$. Continue the table to find $f(6)$ and $f(7)$.
- c. What do you mean by Interpolation? Write the Newton's forward difference Interpolation formula.
- d. Find the roots of the equation $x^3 - 18 = 0$ using Bisection Method.

3. Answer any **ONE** question:

10 x 1 = 10

- a. Using Newton Raphson method, find the root of equation $\sin x + \cos x = 0$
- b. Use the method of false position to obtain the root, correct to 3 decimal places
 $x^3 + x - 1 = 0$