(d) Explain with examples the syntax of scan f( ) and printf( ) functions. 1½

(e) Define order of convergence of an Iterative process. 1½

(f) Find the intervals in which three real roots of the equation

$x^5 - 5x + 2 = 0$ lie. 1½

B.Sc. 4th Semester (Hons) (Common with ID No. 60346 B.Sc. Old Scheme) Examination, May–2016
MATHEMATICS
Paper–BHM–243

Programming in 'C' and Numerical Methods

Time allowed : 3 hours]   *[Maximum marks : 45*

Note : *Attempt any five questions in all, selecting one question from each section. **Question No. 9 (Section–V) is compulsory.***

Section–I

1. (a) What is a flow chart ? Write all the symbols of the flow chart and their meaning. Explain its types.

   4½

   (b) Write an algorithm to find the surface area and volume of a sphere. 4½

2. (a) Explain various type of data-types used in 'C' language. 4½

   (b) What are Assignment and Bitwise operators. Explain them. 4½

Section–II

3. (a) Draw flow chart of while, do-while and for loops and write a program to display a list of numbers by using any one of loops. 4½

(b) Differentiate between the following : 4½

    (i) switch statement and else-if ladder.

    (ii) selection and Iteration control structures.

4. What is an Array ? Explain why arrays are used in programming. Discuss its type and how elements are read and accessed through arrays. 9

Section–III

5. (a) Differentiate between the following :

    (i) Structure and Union

    (ii) String and Array

    (iii) Functions and operators 4½

(b) Explain the difference between call by value and call by reference. 4½

6. (a) Find the real root of the equation

$x^3 - 5x + 3 = 0$ by using Regula-Falsi method. 4½

(b) Find the order of convergence of Newton Raphson method. 4½

Section–IV

7. (a) Solve the system of equation by using Gauss Elimination method :

$x + y + z = 10$

$2x + y + 2z = 17$

$3x + 2y + z = 17$ 4½

(b) Solve the system of equations by using Crout's method:

$2x + 3y + 2z = 2$

$10x + 3y + 4z = 16$

$3x + 6y + z = -6$ 4½

8. Solve the system of equations by using Gauss-Seidel method :

$10x + 2y + z = 9$

$2x + 20y - 2z = -44$

$-2x + 3y + 10z = 22$ 9

Section–V

9. (a) Using statements :

int i = 2, j = 3, k = 4;

float x = 1.0, y = 1.5 1½

Evaluate the following :

    (i) i + = j – K * X + Y

    (ii) Y * = X + K – j * i

    (iii) i – = X + = K/ = j – Y

(b) In what ways does an array differ from an ordinary variable. 1½

(c) What is a variable ? How it is declared ? 1½