GSM/M-20   **1615**

PROGRAMMING IN C & NUMERICAL METHODS

Paper–BM-243

Time Allowed : 3 Hours]   [Maximum Marks : 30

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) Define keywords. Give two examples.   1

     (b) Name fundamental date types in C.   1

     (c) What is Cast operator?   1

     (d) Define pointers.   1

     (e) Write syntax for opening and closing a file. 1

     (f) Define Descarte's rule of sign.   1

UNIT–I

2. (a) Draw a flowchart to find roots of a quadratic equation.   3

     (b) Define variables in C and also discuss rules for defining a variable in C.   3

3. (a) What are operators? Chart various types of operators offered by C language and illustrate precedence of these operators. 3

(b) A program contains the following declaration

int i = 12345, j = –13579, k = –24680;

float a = 2.5, b = 0.005, c = 3000;

Show the output for each of the following print f statements : 3

(i) print f ("%d %d %d", i, j, k);

(ii) print f ("%f %3f %8f", a, b, c);

(iii) print f ("%8.4f %8.3f %+8f", a, b, c);

(iv) print f ("%–8f %08f %+8f", a, b, c);

UNIT–II

4. (a) Describe the following statements with examples:

(i) if – else

(ii) switch. 3

(b) Write a program to generate first n prime numbers. 3

5. (a) What is a function in C? Why do we use functions? What are the different categories of functions in C? 3

(b) Write a program to find trace of a matrix.   3

UNIT–III

6. (a) Illustrate the following functions with examples:

(i) str act ( )

(ii) str copy ( )

(iii) str cmp ( )

(iv) strstr ( )   3

(b) What do you mean by pointers? Explain the concepts of pointer declaration and pointer dereferencing.   3

7. (a) Explain Regula-Falsi method.   3

(b) Find the real root of $x^4 - x - 10 = 0$ by Newton Raphson method, correct to three decimal places.   3

UNIT–IV

8. Find the inverse of the matrix :

$$A = \begin{bmatrix} 1 & 2 & 4 \\ 2 & 5 & 10 \\ 4 & 10 & 21 \end{bmatrix}$$

by Cholesky method.   6

9. Solve the following equations by Jacobi's iteration method : 6

$$10x + y + 2z = 44$$

$$2x + 10y + z = 51$$

$$x + 2y + 10z = 61.$$