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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

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

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

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