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41183

B. Sc. (Pass Course) 4th Semester (Regular/Re-Appear/Improvement) Examination – May, 2023

MATHEMATICS (Programming in C and Numerical Methods)

Paper : 12BSM-243

Time : Three hours] ***[Maximum Marks : 30***

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

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

SECTION – I

1. (a) Write an algorithm to show that whether a number is even or odd. 5.5

   (b) Draw a flowchart to find the greatest among three numbers.

2. (a) What is the difference between post-fix and pre-fix increment and decrement operators ? Explain. 5.5

(b) Write a program to calculate volume and surface area of a sphere when its radius is given.

SECTION – II

3. Explain the following : 5

   (i) The switch statement

   (ii) Rules for naming a function

   (iii) Arrays

4. (a) Write a program to find the sum of the elements of third column of a 3×3 matrix. 5

   (b) What is a function in C ? How do we define and use a function ? Explain with examples.

SECTION – III

5. (a) What do you mean by Pointer ? Explain the concepts of pointer declaration and pointer dereferencing. 5

   (b) Differentiate between static and automatic variable.

7. (a) Find a root of $x^3 - x + 1 = 0$ using Bisection method correct to three decimal places. 5

(b) Find order of convergence for Regula Falsi method.

SECTION – IV

8. Solve the following equations by LU decomposition method. 5

$$2x - 6y + 8z = 24$$

$$5x + 4y - 3z = 2$$

$$3x + y + 2z = 16$$

8. Solve the following equations by Gauss-Seidal method : 5

$$5x + y + 2z = 19$$

$$x + 4y - 2z = -2$$

$$2x + 3y + 8z = 39$$

SECTION – V

9. (a) Define character constants. $1.5 \times 6 = 9$

(b) What do you mean by reversing the string ?

(c) Write the syntax of for -loop.

(d) What is an expression ? What are its components ?

(e) Write Newton-Raphson method.

(f) Explain Gauss-Jordan method.