647510 **BSc5MatC502x** **Seat No :_____**

B.Sc. Semester - 5 (Remedial) (*CBCS*) Examination
March/April-2024 (NEW COURSE)
Programming in C and Numerical Analysis -1(Core)

Time: 2:30 Hours **Marks: 70**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que-1(A) **ATTEMPT ANY TWO:** (10)

(1) Explain : C- constants
Write syntax rules for constructing INTEGER constants in C.

(2) Explain: identifiers in C.

(3) Explain Type Declaration Instructions in C.

Que-1(B) **ATTEMPT ANY ONE :** (04)

(1) Explain: Arithmetic Instructions in C.

(2) Explain: Type conversion in assignments in C.

Que-2(A) **ATTEMPT ANY TWO:** (10)

(1) Write a short note on ***loop control structures*** In C.

(2) Write a short note on ***data types*** in C.

(3) Write a C program to find the product of rectangular matrices of orders 3×4 and 4×3.

Que-2(B) **ATTEMPT ANY ONE :** (04)

(1) Write a short note on ***functions*** in C.

(2) Write a C program to solve a quadratic equation.

Que-3(A) **ATTEMPT ANY TWO:** (10)

(1) Write a short note on ***pre-processor directives*** in C.

(2) Write a short note on ***arrays*** in C.

(3) Write a short note on ***macros*** in C.

Que-3(B) **ATTEMPT ANY ONE :** (04)

(1) Write a C program to find ***trace*** of a square matrix of order n.

(2) Write an efficient C program to calculate $\boldsymbol{n}!$ ($\boldsymbol{n \leq 10}$).

Que-4(A) **ATTEMPT ANY TWO:** (10)

(1) Solve the following system of simultaneous linear equations by Gauss Elimination Method. $\boldsymbol{x + 2y + 3z = 14;\ \ 2x - y + z = 3;\ \ 5x + 7y - 10z = -11.}$

(2) Explain: Crout's Method.

(3) Explain exponential curve fitting and fit $y = ax^b$ to the following data.

x	1	2	3	4	5
y	7.1	27.8	62.1	110	161

Que-4(B) **ATTEMPT ANY ONE :** (04)

(1) Explain: Gauss-Jacobi's Iterative Method for solving a system of simultaneous linear equations.

(2) Explain: Method of least squares.

Que-5(A) **ATTEMPT ANY TWO:** (10)

(1) Explain: Error propagation in difference table

(2) Derive Gregory-Newtons' backward interpolation formula.

(3) Assuming that the following values of y_x belong to a polynomial of degree four, compute the next two values.

x	2	4	6	8	10	12	14
y_x	2	3	5	8	9	---	---

Que-5(B) **ATTEMPT ANY ONE :** (04)

(1) In standard notations, show that $\boldsymbol{D = \frac{1}{h}\left[\nabla + \frac{\nabla^2}{2} + \frac{\nabla^3}{3} + \frac{\nabla^4}{4} + \cdots\right]}$.

(2) Explain: Interpolation and Extrapolation.

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