

B.Sc. Semester - 5 (Remedial) (CBCS) Examination**March/April-2023 (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.

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

- (1) Explain : C- constants
Write syntax rules for constructing REAL constants in C.
- (2) What are C-variable names?
Write syntax rules for creating variable names in C.

(3) Explain: Tokens in C.

(B) ATTEMPT ANY ONE :**04**

- (1) Explain: Arithmetic Instructions in C.
- (2) Explain: Type conversion in assignments in C.

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

- (1) Write a short note on **for** loop.
- (2) Write a short note on data types in C.
- (3) Write a C program to print all multiples of 3 less than 1000.

(B) ATTEMPT ANY ONE :**04**

- (1) Write a short note on functions in C.
- (2) Write a C program to calculate factorial of $n(n \leq 10)$.

Q-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.

(B) ATTEMPT ANY ONE :**04**

- (1) Write a C program to add two matrices.
- (2) Write a C program to find trace of a square matrix of order n.

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

- (1) Solve the following system of simultaneous linear equations by Gauss Elimination Method.
 $x + 2y + 3z = 14$; $2x - y + z = 3$; $5x + 7y - 10z = -11$.
- (2) Explain: Triangularization Method.
- (3) Explain exponential curve fitting and fit $y = ax^b$ to the following data.

<i>x</i>	1	2	3	4	5
<i>y</i>	7.1	27.8	62.1	110	161

(B) ATTEMPT ANY ONE :**04**

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

Q-5

(A) ATTEMPT ANY TWO:

10

- (1) Explain: Error propagation in difference table.
- (2) Derive Gregory-Newtons' backward interpolation formula.
- (3) Interpolate the missing values **a** & **b** in the following table of rice cultivation in India.

Year (x)	1911	1912	1913	1914	1915	1916	1917	1918	1919
Acres(y)	76.6	78.2	a	77.7	78.7	b	80.6	77.6	78.6

(B) ATTEMPT ANY ONE :

04

- (1) In standard notations, show that $D = \frac{1}{h} \left\{ \Delta - \frac{\Delta^2}{2!} + \frac{\Delta^3}{3!} - \frac{\Delta^4}{4!} + \dots \right\}$.
- (2) Explain: Interpolation and Extrapolation.
