

B.Sc. Semester - 5 (Remedial) (CBCS) Examination**March/April-2026 (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) Write a short note on historical development of C.
- (2) Write a short note on C- variables.
- (3) Write a short note on C- keywords.

Que.1(B) ATTEMPT ANY ONE : (04)

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

Que.2(A) ATTEMPT ANY TWO: (10)

- (1) Explain: Loop Control Structures in C in details.
- (2) Write a short note on data types in C.
- (3) Write a C program to calculate factorial of n ($1 \leq n \leq 10$).

Que.2(B) ATTEMPT ANY ONE : (04)

- (1) Write a short note on functions in C.
- (2) Write a C program to determine the largest among three real numbers.

Que.3(A) ATTEMPT ANY TWO: (10)

- (1) Write a short note on preprocessor 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 add two matrices.
- (2) Write a C program using macro with argument.

Que.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: Method of LU decomposition method.
- (3) Explain exponential curve fitting and fit $y = ae^{bx}$ to the following data.

x	0	0.5	1.0	1.5	2.0	2.5
y	0.10	0.45	2.15	9.15	40.35	180.75

Que.4(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) What do you mean by the line of best fit ? Explain.

Que.5(A) ATTEMPT ANY TWO: (10)

- (1) Derive Gregory-Newton's backward interpolation formula.
- (2) Explain: Error propagation in difference table
- (3) Interpolate the missing values y_2 & y_5 in the following table of wheat cultivation in India.

Year (x)	1911	1912	1913	1914	1915	1916	1917	1918	1919
Acres(y)	76.6	78.2	y_2	77.7	78.7	y_5	80.6	77.6	78.6

Que.5(B) ATTEMPT ANY ONE : (04)

- (1) In standard notations, deduce, $y_n = \binom{n}{0}y_0 + \binom{n}{1}\Delta y_0 + \binom{n}{2}\Delta^2 y_0 + \dots + \binom{n}{n}\Delta^n y_0$.
- (2) Explain: Interpolation and Extrapolation.
