

B.Sc. Semester - 5 (Remedial) (CBCS) Examination
March/April-2025 (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.
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Que-1 (A) ATTEMPT ANY TWO: (10)

- 1) Write a short note on historical development of C.
- 2) Explain : C- constants
Write syntax rules for constructing floating point constants in all forms in C.
- 3) Explain Type Declaration Instructions in C.

(B) ATTEMPT ANY ONE : (04)

- 1) Explain: Arithmetic Instructions in C.
- 2) Explain: Integer and Float conversion in C.

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

- 1) Explain *for loop*.
Also explain how *for loop* is different from *while* and *do-while* loops.
- 2) Write a short note on the Precedence(Hierarchy) of Operators in C.
- 3) Write a C program to find the product of two square matrices of order 4.

(B) ATTEMPT ANY ONE : (04)

- 1) Write a short note on *functions* in C.
- 2) Write a C program to find maximum of three integers.

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.

(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 *n!* (*n* ≤ 10).

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

- 1) Solve the following system of simultaneous linear equations by Gauss Elimination Method.

$$3x + 2y + 7z = 32; 2x + 3y + z = 40; 3x + 4y - z = 58.$$

- 2) Explain: LU decomposition 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

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

- 1) Explain: **Gauss-Seidel** Iterative Method for solving a 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) Interpolate the missing values a & b in the following table of rice cultivation in India.

Year (x)	1981	1982	1983	1984	1985	1986	1987	1988	1989
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

$$\mu^{-1} = 1 - \frac{1}{8}\delta^2 + \frac{3}{128}\delta^4 - \frac{5}{1024}\delta^6 + \dots$$

- 2) Explain: Interpolation and Extrapolation.
