

B.Sc. Semester - 5 (CBCS) Examination**Oct/Nov - 2021 (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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Q-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 integer constants in C.

- (3) Explain: Identifiers in C.

(B) ATTEMPT ANY ONE : 04

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

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

- (1) Give detailed explanation of Loop Control Structures in C.
- (2) Write a short note on data types in C.
- (3) Write a C program to calculate factorial of a natural number $n \leq 10$.

(B) ATTEMPT ANY ONE : 04

- (1) Write a short note on functions in C.
- (2) Write a C program to solve a quadratic equation.

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 enter & to print the marks of ten subjects of a student through keyboard and to calculate & to print percentage of marks.

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

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

$$x + 2y + 3z = 6; \quad 2x - y + z = 2; \quad 5x + 7y - 10z = 2.$$

- (2) Explain: Method of factorization.
- (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

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

- (1) Explain: Gauss-Jacobi's Iterative Method for solving a simultaneous linear equations.
- (2) What do you mean by the line of best fit? Explain.

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

- (1) Explain: Error propagation in difference table
- (2) Derive Gregory-Newtons' forward 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.
