

B.Sc. Semester - 5 (CBCS) Examination

Oct/Nov.- 2024 (Old 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) Answer any one out of two. (07)
1. Explain if else statement.
 2. Explain C-instructions in detail.
- Que.1(B) Answer any one out of two. (04)
1. Explain printf() in C.
 2. Explain hierarchy of operations in C.
- Que.1(C) Answer any one out of two. (03)
1. Write logical operators with meaning.
 2. Explain nested if statement in C.
- Que.2(A) Answer any one out of two. (07)
1. Explain while loop.
 2. Explain do-while loop.
- Que.2(B) Answer any one out of two. (04)
1. Explain long and short integer data types in C.
 2. Write a program to generate arithmetic progression.
- Que.2(C) Answer any one out of two. (03)
1. Explain continue statement.
 2. Explain break statement.
- Que.3(A) Answer any one out of two. (07)
1. Explain array in C.
 2. Write a program to find multiplication of two 3x3 matrices.
- Que.3(B) Answer any one out of two. (04)
1. Explain Macros with argument.
 2. Write a program to find a geometric progression for given value of a and r.
- Que.3(C) Answer any one out of two. (03)
1. Explain two-dimensional array initialization.
 2. Explain C Preprocessor.
- Que.4(A) Answer any one out of two. (07)
1. Explain method of LU decomposition.
 2. Derive Gauss Jacobi iteration method.
- Que.4(B) Answer any one out of two. (04)
1. Solve the following system of linear equation by Gauss elimination method.

$$x + 4y + 9z = 34; \quad 2x + y + z = 12; \quad 3x + 2y + 3z = 24$$
 2. Fit a straight-line $y = ax + b$ to the following data.

x:	1	2	3	4	5
y:	14	27	40	55	68

- Que.4(C) Answer any one out of two. (03)
1. What do you mean by the line of best fit? Explain.
 2. Explain linear law and reduce $y = ax^b$ using linear law.
- Que.5(A) Answer any one out of two. (07)
1. Derive Gregory Newton forward interpolation formula.
 2. Explain: Interpolation and Extrapolation.
- Que.5(B) Answer any one out of two. (04)
1. Express $f(x) = 3x^4 - 4x^3 + 6x^2 + 2x + 1$ in factorial notation.
 2. Evaluate $\Delta^3 f(x)$ for $f(x) = (1-x)(1-2x)(1-3x)$ if $h = 1$.
- Que.5(C) Answer any one out of two. (03)
1. Form a table of forward differences of the function
 $f(x) = x^4 - 5x^3 + 6x^2 + x - 2$ for $x = -3, -2, -1, 0, 1, 2, 3$.
 2. Prove that $(\Delta + \nabla)^2(x^2 + x) = 8$ where $h = 1$.
