

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

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- Q-1 (A) Answer any one out of two [7]**
(1) Explain if statement.
(2) Explain instructions in C.
- (B) Answer any one out of two [4]**
(1) Explain scanf() in C.
(2) Explain nested if statement with example.
- (C) Answer any one out of two [3]**
(1) Write logical operators with meaning.
(2) Write relational operators with meaning.
- Q-2 (A) Answer any one out of two [7]**
(1) Explain do-while loop.
(2) Explain for loop.
- (B) Answer any one out of two [4]**
(1) Explain integer data type in C.
(2) Write a program to find sum of digits of given number.
- (C) Answer any one out of two [3]**
(1) Differentiate continue and break statement.
(2) Explain go to statement.
- Q-3 (A) Answer any one out of two [7]**
(1) Write a program to find multiplication of two 3x3 matrices.
(2) Explain array initialization.
- (B) Answer any one out of two [4]**
(1) Explain Macros without argument.
(2) Write a program to an arithmetic progression for given value of a and d.
- (C) Answer any one out of two [3]**
(1) What is an Array?
(2) Explain C pre processor.
- Q-4 (A) Answer any one out of two [7]**
(1) Explain Gauss elimination method .
(2) Fit normal equation for parabola
 $y=ax^2+bx+c$, using principle of least squares method.
- (B) Answer any one out of two [4]**
(1) Fit a straight line $y=ax+b$ for the following data.
X: 1 2 3 4 5
Y: 14 27 40 55 68
(2) Solve the following system of linear equation by Gauss Jordan method.
 $X+4y+9z=34$; $2x+y+z=12$; $3x+2y+3z=24$

(C) Answer any one out of two

[3]

- (1) Derive Gauss Seidel iteration method.
- (2) Explain a linear law for graphical method.

Q-5 (A) Answer any one out of two

[7]

- (1) Derive Gregory Newton backward interpolation formula.
- (2) Prove that n^{th} difference of a polynomial of degree n are constant.

(B) Answer any one out of two

[4]

- (1) Express $f(x)=x^3-2x^2+x-1$ in factorial notation
- (2) Evaluate $\Delta^3 f(x)$ for $f(x)=(3x+1)(3x+4)(3x+7)\dots\dots(3x+19)$.

(C) Answer any one out of two

[3]

- (1) Form a table of forward differences of the function $f(x)=x^3-3x^2-5x-7$ for $x=-1,0,1,2,3,4,5$.
- (2) Prove that $(\Delta+7)^2(x^2+x)=8$ where $h=1$.
