

B.Sc. Semester - 5 (CBCS) Examination**Oct/Nov - 2022 (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.

- Q-1 (A) Answer any two out of three. [10]
 (1) Explain if- else statement.
 (2) Write a program to find Arithmetic Progression for given value of a and d.
 (3) Explain type declaration statement.
- (B) Answer any one out of two [04]
 (1) Write logical operators with meaning.
 (2) Explain printf() function.
- Q-2 (A) Answer any two out of three. [10]
 (1) Explain do-while loop.
 (2) Explain for loop.
 (3) Write a program to find sum of digits of a given number.
- (B) Answer any one out of two [04]
 (1) Explain integer data type in C.
 (2) Explain continue and break statement.
- Q-3 (A) Answer any two out of three [10]
 (1) Explain Macros without argument.
 (2) Write a program to find addition of two 3x3 matrices.
 (3) Explain Array in C.
- (B) Answer any one out of two [04]
 (1) Explain one dimensional and two dimensional array initialization.
 (2) Explain C pre processor.
- Q-4 (A) Answer any two out of three. [10]
 (1) Explain L.U. decomposition method.
 (2) Using Principle of least squares Obtain normal equation for $y=ax+b$.
 (3) Solve the following system of linear equation by Crout's method.
 $2x-6y+8z=24$; $5x+4y-3z=2$; $3x+y+2z=1$.
- (B) Answer any one out of two [04]
 (1) Solve the following system of linear equation by Gauss Elimination method.
 $x-y+z=1$; $-3x+2y-3z=-6$; $2x-5y+4z=5$
 (2) Fit a parabola $y=ax^2+bx+c$ for the following data.

X:	0	1	2	3	4
Y:	1	5	10	22	38
- Q-5 (A) Answer any two out of three. [10]
 (1) Prove that n^{th} difference of a polynomial of degree n are constant.
 (2) Derive Gregory Newton forward interpolation formula.
 (3) The value of polynomial of degree 5 are tabulated below. If $f(3)$ is known to be an error, find its correct value.
- | | | | | | | | |
|-------|---|---|----|-----|------|------|------|
| x: | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| f(x): | 1 | 2 | 33 | 254 | 1025 | 3126 | 7777 |
- (B) Answer any one out of two [04]
 (1) Prove $\frac{\Delta^2}{E} \sin(x+h) + \frac{\Delta^2 \sin(x+h)}{E \sin(x+h)} = 2(\cosh - 1) [\sin(x+h) + 1]$.
 (2) Express $f(x)=7x^4+12x^3-6x^2+5x-3$ in factorial notation taking $h=2$ and find their differences of second order.
