

B.Sc. Semester - 5 (CBCS) Examination**Oct/Nov. - 2018****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) Answer any one of the following questions. (07)
- (1) Explain syntax rules for constructing real constants.
 - (2) Explain multiline comments and single line comments in C language.
- (B) Answer any one of the following questions. (04)
- (1) Explain in detail C keywords.
 - (2) Explain syntax rules for constructing identifiers.
- (C) Answer any one of the following questions. (03)
- (1) Write C program to determine whether a given number is even or odd.
 - (2) Explain scan $f()$ function.
- Que-2 (A) Answer any one of the following questions. (07)
- (1) Explain in detail user defined function.
 - (2) Explain do while loop with example.
- (B) Answer any one of the following questions. (04)
- (1) Explain break statement with its syntax.
 - (2) Write a C program to find sum of the digits in a given number.
- (C) Answer any one of the following questions. (03)
- (1) Explain short signed and unsigned integer.
 - (2) Explain floats and doubles.
- Que-3 (A) Answer any one of the following questions. (07)
- (1) Write C program to solve a quadratic equation.
 - (2) Write C program to add two matrixes.
- (B) Answer any one of the following questions. (04)
- (1) Explain the syntax of two dimensional array with example.
 - (2) Explain types of C preprocessor derivatives in brief.
- (C) Answer any one of the following questions. (03)
- (1) Explain macro substitution derivatives in C language.
 - (2) Explain file inclusion derivatives in C language.
- Que-4 (A) Answer any one of the following questions. (07)
- (1) Explain L.U. decomposition method to solve a system of linear equations.
 - (2) Explain principle of least squares and obtain normal equations of a line.
- (B) Answer any one of the following questions. (04)
- (1) Solve the following system of equations by Gauss Jordan Method.
 $10x + y + z = 12, 2x + 10y + z = 13, x + y + 5z = 7$
 - (2) Find linear law for the curves $y = ae^{bx}$ and $xy = ax + by$.
- (C) Answer any one of the following questions. (03)
- (1) Explain Jacobi's iteration method to solve a system of linear equations.
 - (2) Explain Gauss-Seidel iteration method.
- Que-5 (A) Answer any one of the following questions. (07)
- (1) Derive Gregory Newton forward interpolation formula.
 - (2) Derive Gregory Newton backward interpolation formula.

(B) Answer any one of the following questions. (04)

(1) If the interval of differencing is unity, prove that

$$\Delta^2 \left[\frac{5x+12}{x^2+5x+6} \right] = \frac{10x+32}{(x+2)(x+3)(x+4)(x+5)}$$

(2) Find missing term in the following table.

X	1	2	3	4	5	6	7
$f(x)$	2	4	8	-	32	64	28

(C) Answer any one of the following questions. (03)

(1) Express the polynomial $p(x) = x^4 + 6x^2 - 7x + 6$ in factorial notation if the interval of differencing is one.

(2) With usual notations prove that $\mu = \frac{2+}{2\sqrt{1+}}$
