647510 **BSCc&nCC5020** **Seat No :_____**

B.Sc. Semester - 5 (Remedial) (*CBCS*) Examination
March/April-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) ATTEMPT ANY ONE (07)

(1) Write a short note on history of C language.

(2) Explain : C- constants and its types.
Write syntax rules for constructing character constants in C.

Que-1(B) ATTEMPT ANY ONE (04)

(1) Write a short note on Arithmetic Instructions in C.

(2) Explain: Type conversion in assignments in C.

Que-1(C) ATTEMPT ANY ONE (03)

(1) Write a short note on Logical Operators in C.

(2) Write a C-program which is efficient to calculate 10 !

Que-2(A) ATTEMPT ANY ONE (07)

(1) Explain: Loop Control Structures in C in details.

(2) Write a C program to print all the multiples of 7 which are less than 500.

Que-2(B) ATTEMPT ANY ONE (04)

(1) Write a C program to calculate compound interest.

(2) Write a short note on functions in C.

Que-2(C) ATTEMPT ANY ONE (03)

(1) Explain: continue statement

(2) Write a C-program using atleast two User Defined Functions.

Que-3(A) ATTEMPT ANY ONE (07)

(1) Write a short note on pre-processor directives in C.

(2) Write a short note on arrays in C.

Que-3(B) ATTEMPT ANY ONE (04)

(1) Write a C program to multiply two matrices of order 2×2.

(2) Write a C program to enter & print the marks of ten subjects of a student through keyboard and calculate & print percentage of marks.

Que-3(C) ATTEMPT ANY ONE (03)

(1) Explain: Macros.

(2) Write a C-program using macros.

Que-4(A) ATTEMPT ANY ONE (07)

(1) Solve the following system of simultaneous linear equations by Gauss Elimination Method.
$x + 2y + 3z = 14; 2x - y + z = 3; 5x + 7y - 10z = -11$.

(2) Explain: Method of factorization.

Que-4(B) ATTEMPT ANY ONE (04)

(1) Write a short note on the method of least squares.

(2) Explain: Gauss-Jacobi Iterative Method for solving a system of simultaneous linear equations.

Que-4(C) ATTEMPT ANY ONE (03)

(1) Solve the following system of simultaneous linear equations by Crout's Method. $3x + 2y + 7z = 32; 2x + 3y + z = 40 ; 3x + 4y - z = 58$.

(2) Solve the following system of simultaneous linear equations by Gauss-Seidel Method(upto three decimal places).
$9x + 2y + 4z = 20 ; x + 10y + 4z = 6 ; 2x - 4y + 10z = -15.$

Que-5(A) ATTEMPT ANY ONE (07)

(1) Derive Gregory-Newton forward interpolation formula.

(2) Assuming that the following values of y_x belong to a polynomial of degree four, compute the next two values.

x	2	4	6	8	10	12	14
y_x	2	3	5	8	9	---	---

Que-5(B) ATTEMPT ANY ONE (04)

(1) In standard notations, show that $D = \frac{1}{h}\left[\nabla + \frac{\nabla^2}{2} + \frac{\nabla^3}{3} + \frac{\nabla^4}{4} + \cdots\right]$

(2) Explain: Interpolation and Extrapolation.

Que-5(C) ATTEMPT ANY ONE (03)

(1) In standard notations, deduce,
$y_n = \binom{n}{0}y_0 + \binom{n}{1}\Delta y_0 + \binom{n}{2}\Delta^2 y_0 + \ldots + \binom{n}{n}\Delta^n y_0$.

(2) Define: Backward Difference Operator ∇. Show that
$y_{n-k} = y_n - \binom{k}{1}\nabla y_n + \binom{k}{2}\nabla^2 y_n - \cdots + (-1)^k \nabla^k y_n$..

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