

B.Sc. Semester - 5 (CBCS) Examination

December - 2020 (Old Course)

PROGRAMMING IN C AND NUMERICAL ANALYSIS-1(CORE)

Time: 1:30 Hours

Marks: 42

Instructions:

1. Figures to the right indicate marks.
 2. There are five questions in the question paper.
 3. Answer any three of the following questions.
-

- Que-1 (a) Answer any two out of Three. (10)
1. Discuss primary constants briefly.
 2. Discuss *if-else* statement with flow chart and appropriate example.
 3. Write a program to solve the quadratic equation $ax^2 + bx + c = 0$.
- (b) Answer any one out of two. (04)
1. Discuss keywords and give at least 10 keywords.
 2. Let a, b, c are integer variables and x, y, z are float variables with $a = 5, b = 2, x = 9$ and $y = 6$. Then answer the following.
(i) if $c = \frac{a}{b}$, then $c = \underline{\hspace{2cm}}$. (iii) if $z = \frac{a}{y}$, then $z = \underline{\hspace{2cm}}$.
(ii) if $c = \frac{x}{b}$, then $c = \underline{\hspace{2cm}}$. (iv) if $z = \frac{x}{y}$, then $z = \underline{\hspace{2cm}}$.
- Que-2 (a) Answer any two out of three. (10)
1. Explain the syntax of *user define function (UDF)* using proper example program.
 2. Write a program to print all prime numbers from 1 to 300.
 3. Write a program to evaluate nPr and nCr .
- (b) Answer any one out of two. (04)
1. Explain the term *break* in C, also give appropriate example for the same.
 2. A cashier had currency notes of denominations 10, 50 and 100. If the amount to be withdraw is input through the keyboard in hundreds. Find the total number of currency notes of each denomination the cashier will have to give to the withdrawer.
- Que-3 (a) Answer any two out of three. (10)
1. Discuss input and output of the C-processors and specify the typed of preprocessor directives.
 2. Explain Macro with arguments in C with syntax and example.
 3. Write a program to pick up the largest number from 5 row by 5 column matrix.
- (b) Answer any one out of two. (04)
1. Explain the syntax of the *one dimensional array* with proper example.
 2. Write a program to check whether entered 2×2 matrix is symmetric or not.
- Que-4 (a) Answer any two out of three. (10)
1. Solve the following equation by Gauss-Jordan method.
 $2x + 2y - z + t = 4, 4x + 3y - z + 2t = 6, 8x + 5y - 3z + 4t = 12, 3x + 3y - 2z + 2t = 6$.
 2. Solve the following system of linear equations by triangularization method:
 $a_{11}x_1 + a_{12}x_2 + a_{13}x_3 = b_1, \quad a_{21}x_1 + a_{22}x_2 + a_{23}x_3 = b_2, \quad a_{31}x_1 + a_{32}x_2 + a_{33}x_3 = b_3$.
 3. Derive normal equations for $y = ax^2 + bx + c$.

(b) Answer any one out of two.

(04)

1. Solve the following system of linear equations by Gauss-seidel method.

$$9x + 2y + 4z = 20, \quad x + 10y + 4z = 6, \quad 2x - 4y + 10z = -15.$$

2. The following value of x and y are supposed to follow the law $y = ax^2 + b \log_{10} x$. Find graph-ically the most probable value of the constants a and b .

x	2.85	3.88	4.66	5.69	6.65	7.77	8.67
y	16.7	26.4	35.1	47.5	60.6	77.5	93.4

Que-5 (a) Answer any two out of three.

(10)

1. Derive Gregory-Nowton forward interpolation formula.
2. Express $P(x) = x^4 - 3x^3 - 5x^2 + 6x - 7$ in factorial notation and get their successive forward differences.
3. Show that n^{th} forward difference of n^{th} degree polynomial is constant and hence prove that $n + 1^{\text{th}}$ difference is 0.

(b) Answer any one out of two.

(04)

1. Find and correct a single error in y in the following table.

x	0	1	2	3	4	5	6	7
$Y=f(x)$	0	0	1	6	24	60	120	210

2. Find the missing value in the following table.

x	16	18	20	22	24	26
y	43	89	-	155	268	388
