BCG-003-001514   Seat No. _____

B. Sc. (Sem. V) (CBCS) Examination

August – 2021

BSMT - 502 : Mathematics

(Programming in C & Numerical Analysis - I)

(Old Course)

Faculty Code : 003

Subject Code : 001514

Time : $2\frac{1}{2}$ Hours]   [Total Marks : **70**

Instruction:

(1) All the questions are compulsory.

(2) Numbers written in the right indicate marks of the questions.

1 Answer all the following 20 short answer questions.   **[20]**

 1. What is full form of BCPL?
 2. How much memory required to store a value of double type?
 3. Which array is called matrix?
 4. printf () belongs to _ _ _ _ _ header file.
 5. What is the range of integer constants?
 6. What is the use of "\n" in printf() ?
 7. Write the output of printf("\nJAY\n\tJAVAN\n\t\tJAY\n\t\t\tKISHAN.").
 8. What is the numerical value of 10/3 in C – language?
 9. By default the first element numbered in the array is _____
 10. Who invented C language? In which year it was invented?
 11. In which method matrix is transformed into upper triangular matrix?
 12. What is L and U in Crout's Method?
 13. Write name of any two iterative method.
 14. Prove that $(1 + \Delta)(1 - \nabla) = 1$
 15. Express δ in terms of E.
 16. The nth difference of a polynomial of degree n is _____
 17. Write relation between Δ & E.
 18. Write linear law of the equation $y = ab^x$.
 19. Gauss Jordan method is modification of _____
 20. Define: Interpolation

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2(A) Attempt any THREE [06]
1. Explain void data type.
2. Draw a flow chart of for loop.
3. Describe the meaning of following declaration: float table [5] [3];
4. Explain meaning of mix mode arithmetic statement with examples.
5. Write a C program to calculate area of a circle when radius is not given.
6. Explain float and double.

(B) Attempt any THREE [09]
1. Explain break statement in C.
2. Explain printf function with an example.
3. Give an example of User Defined Function
4. Explain the syntax of the One Dimensional Array with proper example.
5. Explain macro with argument in C language with syntax and example.
6. Write a C program to evaluate factorial of a given number.

(C) Attempt any TWO [10]
1. Explain the methods to declare and initialize the Two Dimensional Array.
2. Write Program to input and output 10 X 2 matrix.
3. Explain the meaning and provide list of LOGICAL OPERATORS being used in C, also give proper examples for the same.
4. Write a program to calculate compound interest for given principal, rate of interest and years.
5. Explain if statement with example.

3(A) Attempt any THREE [06]
1. Explain Linear Law.
2. Explain how to fit the curve of the type $y = ax^b$.
3. If the interval of differencing is unity then prove that $\Delta \frac{2^x}{x!} = \frac{2^x(1-x)}{(x+1)!}$
4. Write normal equation of the curve y = ax + b
5. Evaluate $\Delta[\frac{f(x)}{g(x)}]$
6. Express $p(x) = x^4 - 12x^3 + 42x^2 - 30x + 9$ as a factorial polynomial.

(B) Attempt any THREE [09]
1. Solve the system
$$x + y + 5z = 7, 2x + 10y + z = 13, 10x + y + z = 12$$
By Gauss Jordan Method.
2. In usual notation prove that
$$\frac{\Delta}{\nabla} - \frac{\nabla}{\Delta} = E - E^{-1}$$
3. Explain Jacobi's Method.
4. Prove that $\mu^2 = 1 + \frac{\delta^2}{4}$
5. Find the missing values in the following table of values of x and y.

x	0	1	2	3	4	5	6
y	-4	-2	-	-	220	546	1148

6. Find $\Delta^2[\frac{1}{x\,(x+3)\,(x+6)}]$

(C) Attempt any TWO [10]

1. Explain: Crout's Method.
2. Fit a curve of the form $y = ax^b$ to the data given. Below in least square sense :

x	1	2	3	4	5
y	7.1	27.8	62.1	110	161

3. Derive Gregory Newton Forward Interpolation Formula.
4. In the following table one value is incorrect and y is cubic polynomial in x:

x	0	1	2	3	4	5	6	7
y	25	21	18	18	27	45	76	123

Construct a difference table for y and use it to locate and correct the wrong value.

5. Explain Least squares principle and Obtain normal equations for straight line.

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