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

October - 2017

Mathematics : BSMT - 502 (A)

Faculty Code : 003
Subject Code : 001514

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

1   Answer in brief : Each question carries one mark :   20

   (1)   What is full form of BCPL ?

   (2)   Give complete list of keywords of language C.

   (3)   Write the range of real constants.

   (4)   How much memory is required to store a value of double type?

   (5)   Write general form of usage of conditional operators.

   (6)   Give the list of loop control structure.

   (7)   A self-contained block of statements that performs a coherent task of some kind is known as _____. Fill in the blank.

   (8)   Write output of the following :

         float number = 21;

         number=12/3.

         printf (The number is %f, number);

   (9)   Write logical operators.

   (10) Which array is called matrix?

   (11) In the method of factorization (triangulation) the matrix is _____ Fill in the blank.

   (12) Prove that $(1+\Delta)(1-\nabla) = 1$

   (13) Write the polynomial in factorial notation.

   (14) $\Delta x^{(n)} = $ _____. Fill in the blank.

(15) Gauss-Jordan method is modification of _____ . Fill in the blank.

(16) Express $\Delta^2 y_8$ in terms of $y_8, y_7 \text{ and } y_6$

(17) Express δ in terms of shift operators.

(18) Represent the function $f(x) = x^3 - 2x^2 + x - 1$ by synthetic division method.

(19) Define : Interpolation

(20) What is the value of $x^{[0]}$?

2   (A)   Attempt any **three** :   6

    (1)   Explain syntax and usages of "break" keyword in C-Language with example.

    (2)   Explain scanf( ).

    (3)   Explain float and double.

    (4)   Explain Macro substitution. Explain in C-Language with syntax and examples.

    (5)   Write a C-Program to find the value of one number raised to other for the number entered through keyword.

    (6)   Explain Long and Short Integers.

  (B)   Attempt any **three** :   9

    (1)   Write program to find sum of only ten non-negative numbers out of entered numbers through keyboard using continue statement.

    (2)   Write a detailed note on "nested if-else statement".

    (3)   Write a C-Program to pick up the largest of n given numbers entered through keyword.

    (4)   Explain Syntax to declare and initialize two-dimensional array in C.

(5) Write a C-program to evaluate factorial of a given number.

(6) Write a C-Program to input a 3 × 3 matrix and output its transpose matrix.

(C) Attempt any **two** :   10

(1) Write a C-Program to calculate 2 + 4 + 6 + ... + 100.

(2) Write a detailed note on history of C-Language.

(3) Write the rules to make names (Identifiers) in C. Give proper examples.

(4) Write a short note on the operators in C-Language.

(5) Explain the methods to declare one initialize the One-dimensional array.

3 (A) Attempt any **three** :   6

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

that $\Delta \dfrac{2^x}{x!} = \dfrac{2^x (1-x)}{(x+1)!}$.

(2) Prove that $\mu^2 = 1 + \dfrac{\delta^2}{4}$.

(3) Write the equation of Gregory-Newton forward interpolation formula.

(4) Explain Interpolation and Extrapolation.

(5) Find the missing term in the following table :

x	1	2	3	4	5
y	2	5	7	–	32

(6) Explain the Linear Law.

(B)   Attempt any **three** :   9

(1)   In usual notations prove that $D = \dfrac{1}{h}\left[\Delta - \dfrac{\Delta^2}{2} + \dfrac{\Delta^3}{3} - \dfrac{\Delta^4}{4} + \ldots \right]$

(2)   Solve the System $10x + y + z = 12; 2x + 10y + z = 13;$
$x + y + 5z = 7$ by Gauss-Jordan Method.

(3)   Solve the Gauss-Seidel method for the following
system of linear equations
$28x + 4y - z = 32; x + 3y + 10z = 24; \quad 2x + 17y + 4z = 35$

(4)   Construct a forward difference table from the
following data and evaluate y_x.

x	0	1	2	3	4
y	1	1.5	2.2	3.1	4.6

(5)   Evaluate $\Delta^2 (1 - ax)(1 - bx^2)(1 - cx^3)(1 - dx^4)$

(6)   The amount A of a substance remaining in a
reaction system after an interval of time t in a
certain chemical experiment is tabulated below :

$t(\min)$	2	5	8	11
$A(gm)$	94.8	87.9	81.3	75.1

Obtain the value of A, where $t = 9$ using Newton
backward interpolation formula.

(C)   Attempt any **two** :   10

(1)   Derive the Gregory-Newton backward interpolation
formula.

(2)   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

(3)   Explain the Triangularisation method.
(4)   Explain the Jacobi method of iteration.
(5)   Explain Court's method.