HDU-CMT-3001   Seat No. _____

M. Sc. (Maths) (Sem. III) (CBCS) Examination

November / December – 2017

Mathematics : CMT-3001

(Progra. in C & Numerical Methods) (New Course)

Time : **2 ½** Hours]   [Total Marks : **70**

Instructions :   (i)   Answer all the questions.

    (ii)   Each question carries 14 marks.

1   Attempt any seven :   **7×2=14**

   (1)   Give definition of flow-chart and draw flow-chart of a program which can display *A* to *Z* letters.

   (2)   Write down ASCII code for '*f*' and '*B*' letters.

   (3)   Write a program which can display '*a*' to '*j*' letters in column form.

   (4)   Give definitions of compiler and lower level language.

   (5)   Write down four names of reserved identifiers (keywords).

   (6)   Write down four name of relational operators.

   (7)   Write down four mathematical functions for a C program.

   (8)   Give definitions of integer constant and real constant.

2   Attempt any two :   **2×7=14**

   (1)   Write a note about importance of C language.

   (2)   Discuss about bisection method.

   (3)   Discuss about recursion of a function in itself by an appropriate program.

   (4)   Write a note about basic structure of a C program.

   (5)   Explain about switch statement and using it write a program which can read date of Jan 2018 and it can find associate day of the date (assuming 1st Jan 2018 is Monday).

3 Attempt any one :   **1×14=14**

    (a) Explain about Lagrange interpolation polynomial, write down program for Lagrange interpolation polynomial and using it solve followings :

x	−1	1	4	5	3
$f(x)$	8	−2	−2	2	?

    (b) Explain Newton-Raphson's method, find order of convergence for N-R method and find an approximate root of $f(x) = x^3 - 4x + 1$ by N-R method.

    (c) Explain Gauss-elimination method and write a program for Gauss elimination method to solve a system $AX=B$ of order n.

4 Attempt any two :   **2×7=14**

    (a) Write a program which can read two integers a and b and it can display *gcd* as well as *lcm* of a and b.

    (b) Write a program which can print first 50 primes 2, 3, 5, 7, ..., 229.

    (c) Write a program which can read two square matrices A, B of order n and it can find value of AB matrix.

5 Attempt any two :   **2×7=14**

    (a) Discuss about false position method.

    (b) Write a program which can display tables of 1 to 10.

    (c) Write a program for secant method.

    (d) Solve the following system of three linearly independent equations, using Gauss-Seidel method :

$$16x_1 + 10x_2 + 2x_3 = 42$$
$$5x_1 + 10x_2 + 5x_3 = 40$$
$$x_1 + 4x_2 + 9x_3 = 36$$