DBJ-CMT-3001 Seat No. _____

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

June – 2022

Mathematics - 3001

(Programming in C & Numerical Methods)

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

Instructions :

(1) There are **ten** questions.

(2) Answer any **five** of them.

(3) Each question carries **14** marks.

1 Answer following short questions : **7×2=14**

(i) Define terms: Program and Lower Level Language.

(ii) Write down at least four names of C-Tokens.

(iii) Write a program which can print 1 to 30 integers in three lines.

(iv) Write a program, which can read two integers and it can find smallest integer from given two integers.

(v) Give definition of flow-chart.

(vi) Determine the value of following, when $a = 10$, $b = 20$ and $c = -12$:

(1) $a * b - 6 - 15$

(2) $b > 25$ && $c < 0$ || $a > 0$.

(vii) Write down format for jump in a loop statement by break.

2 Answer following short questions : **7×2=14**

(1) Write down at least four reserved identifiers.

(2) Write a program which can print 1 to 40 integers in four lines.

(3) Write down name of Relational Operators.

(4) Express following mathematical functions in C - Language :

(i) $\cos x$, (ii) $\log_e x$, (iii) $\sqrt{x}$ and (iv) e^x.

(5) Write a program, which can read two integers and it can find the largest integer from given two integers.

(6) Give definitions: Identifier and Variable.

(7) Draw flow chart, so that one can write a program which can print small letters 'a' to 'z'.

3 Attempt following **two** : **7×2=14**

(a) Write a note about development of C - Language.

(b) Explain about Basic Structure of a C program.

4 Attempt following **one** : **1×14=14**

Discuss about Newton Raphson's Method and write down the program for the same Method.

5 Attempt following **one** : **1×14=14**

Explain about Gauss Seidel Method to solve a system of linear equations.

6 Attempt following **one** : **1×14=14**

Explain about Lagrange interpolation polynomial and derive its formula. Using it write a program for Lagrange interpolation polynomial.

7 Attempt following **one** : **1×14=14**

Explain about N-G forward polynomial and derive its formula. Using it write a program for N-G forward interpolation polynomial.

8 Attempt following **two** : **2×7=14**

(a) Explain about Switch Statement with its format or syntax and appropriate example.

(b) Write a program, which can read two integers a and b and, it can find (a, b), the GCD of a and b as well as $[a, b]$, the LCM of a and b.

9 Attempt following **two** : **2×7=14**

(1) Find a root of $f(x) = x^3 - 7$, using Bisection Method and take initial values $a = 1.5$, $b = 2$.

(2) Write a program which can read any date of 21^{st} century and it can find day of corresponding date, assuming 1^{st} Jan 2001 is Monday.

10 Attempt following **two** : **2×7=14**

(1) Discuss about False Position Method and write flowchart or program for the same method.

(2) Explain about Gauss Elimination Method.