Seat No. _____

HAJ-CMT-3001

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

May – 2023

Mathematics

(Programming in C and Numerical Methods)

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

Instructions :
(1) There are five questions.
(2) All questions are compulsory.
(3) Each question carries 14 marks.

1 Answer following short questions : 7×2=14

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

(2) Write down at least four reserved identifiers.

(3) Express following mathematical functions in C-Language.
(i) $\cos x$, (ii) $\log_e x$, (iii) $\sqrt{x}$ and (iv) e^x.

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

(5) Give definitions : Identifier and Variable.

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

(7) Write down definitions of Compiler and Machine Language.

(8) Write down all possible form for Increment and Decrement operators.

(9) Write down C assignment statement for following :

(i) Area $= \pi r^2 + 2\pi rh,$

(ii) Side $= \sqrt{a^2 + b^2 - 2ab\cos x}.$

(10) Write a program, which can print all the divisors of a given positive integer.

2 Attempt any **two** : 2×7=14

(a) Discuss about simple if statement as well as if else statement.

(b) Write a program which can display tables of 11 to 15 and 16 to 20.

(c) Explain about Gauss Elimination Method.

3 Attempt any one : 1×14=14

(a) Explain about Lagrange interpolation polynomial method and derive its formula. using it, write a program for Lagrange interpolation polynomial.

(b) Explain about N-G backward polynomial method and derive its formula. Using it, write a program for N-G backward interpolation polynomial.

4 Attempt following **two** : 2×7=14

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

(b) Find at least two roots of $f(x) = x^3 - 4x + 1$, using any iterative method.

5 Answer any **two** : 2×7=14

(a) Write a program to find Reverse number of a given integer by digits.

(b) Discuss about While loop Statement.

(c) Explain about following Function Subprogram with suitable example : Argument with Return Value.

(d) Discuss about for loop Statement.

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