B. Sc. 1st Semester Final Examination, 2023
(FYUGP-NEP)
Sub. : Mathematics (SEC)
Paper : Programming in C

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Time : 2 hours Full Marks : 45

The figures in the margin indicate full marks for the questions

1. Answer the following questions : 1 x 5 = 5
   (a) Write the equivalent C expression of $x^3 + e^{xy} + \sqrt{|1 - xy|}$
   (b) If 's' is an integer variable, then *s = 17%5* will return value ..... (Fill in the blanks)
   (c) What is the use of "\n"
   (d) What happens if the condition in a While loop is initially false ?
   (e) What is the use of sizeof operator ?
2. Answer the following questions : *(any five)* 2 x 5 = 10
   (a) What are library functions ? Mention any four library functions in C.
   (b) Give a general structure of a C program.
   (c) Explain the need of *#include< stdio, h >* and *#include < math. h>*
   (d) Explain with examples the syntax of *scanf* ( ) and *printf* ( ) functions.
   (e) Write a C program to find the square root of a given number.

   (f) Give a general syntax of switch statement.
   (g) List a few unconditional control statements in C.
   (h) What is an array variable ? How does it differ from an ordinary variable ?
   (i) What are the four available storage classes in C ?
   (j) Distinguish between actual and formal arguments.
3. Answer the following questions : *(any four)* 4 x 5 = 20
   (a) Give a general syntax of 'if else' statement in C. Explain how it works with a suitable example.
   (b) Write a C program to find the biggest of three given number.
   (c) Write a C program to find the sum of the digits of any given positive integer.
   (d) Give a general syntax of 'for loop' in C. Explain how it works with a suitable example.
   (e) Write a C program to find the sum of given n integers using array.
   (f) Distinguish between library functions and user defined functions. Explain briefly the situation when user de fined functions become useful.
   (g) Write a recursive function to display the first a terms of Fibonacci series.
   (h) Write a function to find the factorial of a given integer and use it to find n_{C_r}.

4. Answer *any one* of the following questions : 1 x 10 = 10
   (a) Write a C program to find the roots of a quadratic equation $ax^2 + bx + c = 0$ for all possible combinations of *a, b* and *c*.
   (b) What is an array variable ? How does it differ from an ordinary variable ? How arrays are initialized in C ? How values in an array are accessed ?
   (c) Write a C program to add two matrices of order *m* x *n*.
   (d) Write a C program to check whether a given number is prime or not.

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