No. of Printed Pages—2

1130 (PDCPC)

[23 HKPD1SNP- 24M]

M.Sc.IT 1st Semester (NEP) Exam. 2023 (W)

M.Sc.IT (DSC)

(Computer Programming Using C)

[CA S1-02]

Full Marks : 50

Time : 2 hours

The figures in the right-hand margin indicate marks.

1. Answer any *four* questions from the following: $10 \times 4 = 40$

   (*a*) What are decision control statements ? Explain in detail. Compare the use of if-else construct with that of ternary operator. $7 + 3 = 10$

   (*b*) Write a C program using switch-case to display a menu that offers five options: read three numbers, calculate total, calculate average, display the smallest, and display the largest value. Mention the usefulness of default statement in switch-case statement. $8 + 2 = 10$

   (*c*) Explain the concept of dynamic memory allocation in C. Provide an example writing a C program to illustrate the use of functions such as malloc, calloc, realloc and free.

   (*d*) Discuss the concept of recursion in C functions. Mention the advantages and disadvantages of using recursion. Illustrate how recursion can be applied to solve specific problems such as factorial computation or Fibonacci sequence generation. $3 + 2 + 5 = 10$

   (*e*) Write the purpose and use of unions in C. Explain how unions can be more memory-efficient than structures in certain scenarios. Provide an example to illustrate the declaration, initialization, and utilization of structures in C programs. $2 + 2 + 6 = 10$

(*f*) Why are arrays needed ? If an array is declared as int arr [5] [4], how many elements can it store ? Write a C program to compute the sum of the elements of a 2D array. 2 + 1 + 7 = 10

(*g*) Describe briefly any three string handling functions in C with their syntax. Differentiate between automatic variable and static variable. 6 + 4 = 10

2. Answer any *two* questions from the following: 5 × 2 = 10

(*a*) Mention the general rule for defining a preprocessor. Explain the importance of the # define preprocesser directive with an example.

(*b*) Define algorithm. Draw a flow chart to find the area and circumference of a circle of radins *r*.

(*c*) What is formal and actual agreement ? Mention the purpose of return statement in C programming.

(*d*) Briefly describe the various modes used with the fopen () functions. Write the purpose of ftell () and rewind () function with their syntax.