B.Sc. (Hons.) I Semester Examination, 2023-24

Subject: Computer Science

Paper: CS-101(Problem Solving through C Programming)

Time: Three hours] [Full Marks: 70

1. Attempt any nine. (2x9=18)

a. Differentiate between *float* and *double* data types.

b. What is the difference between '=' and '= =' operators.?

c. What is the role of *break* keyword in C programming?

d. What is the difference between *string* and *array of characters*?

e. What is the use of *ifndef* keyword in C programming?

f. What is the difference between *scanf( )* and *gets( )* functions?

g. Write syntax and usage of -> *operator* in C.

h. Define the concept of *pointer to pointer* with suitable example.

i. What will be the output of following code? (Explain with reason)

```
void main()
{
  int  x = 10, y = 5, p, q;
  p = x>19;
  q = (p<3)&&(y=3);
  printf("p = %d   q = %d", p, q);
}
```

j. What will be the output of following code? (Explain with reason)

```
void main()
{
  int x = 3, y=2, z;
  z=x++  + ++y;
  printf("x = %d   y=%d  z = %d", x,y,z);
}
```

2.

a. What is an *algorithm*? Draw the flow chart to print real roots of a quadratic equation ax^2+bx+c using *Sridharacharya* formula. (4)

b. Explain the difference between a '*while*' loop and a '*do while*' loop with a suitable example. (5)

c. Explain *switch case* statement with suitable example. (4)

3.

a. Discuss about the *logical* operators in C with suitable example. (4)

b. Differentiate between *actual* and *formal arguments* while using function. Explain *call by reference* with suitable example. (5)

c. Define *recursion*. Write a program for finding factorial of a given number using recursion. (4)

4.

a. State the difference between *register* and *static* storage class variables by using appropriate example. (4)

b. Write your own function for following operations on string: (6)

- **i.** Copy one string into another
- **ii.** Reverse a given string

c. What are *command line arguments*? Why they are used? (3)

5.

a. How the elements of a 2D array are stored in computer memory? Give one example. (2)

b. Differentiate between the concept of '*pointer to an Array'* and '*Array of pointers'* with suitable example. (6)

c. How *pointer* can be used to access the elements of a one-dimensional array. Explain with an example. (5)

6.

a. Explain different possible modes for opening a file? Write a program to copy the contents of one file into another. (5)

a. What do you mean by *Dynamic memory allocation* in C. Explain the role of *realloc()* function with suitable example. (4)

b. Define *structure* with suitable example? How memory allocation is done for structure variables? Give one example. (4)

7.

a. What is the role of *Preprocessor* in C programming? Differentiate between the two methods of *include directives*: #include<mylib.h> and #include "mylib.h". (4)

b. Explain the concept of *nested structure* with suitable example. (5)

c. Define *union* with suitable example. Give one real life example where union can be used. (4)