National Institute of Technology, Delhi

Name of the Examination: B. Tech.

Branch: CSE/ECE/EEE Semester: I
Title of the Course: Problem Solving and
Computer Programming Course Code: CSB101

Time: 3 Hours Maximum Marks: 50

SECTION-A

Q. 1. Attempt all the parts:- [1*10]
  a) What is the difference between array and structures?
  b) What is the difference between macros and functions?
  c) What is the difference between data variable and a pointer variable?
  d) What is the difference between static and dynamic memory allocation?
  e) Explain strcat().
  f) Name the header file which is mandatory while using dynamic allocation in C.
  g) What is the difference between malloc() and calloc().
  h) $(701)_8 - (657)_8 = ()_8$
  i) Convert $(10110101.0101)_2 = ()_{10}$
  j) Subtract using 2's compliment $(63)_{10} - (79)_{10} = ()_{10}$

SECTION-B

Attempt 4 Ques out of 5 Ques(Q.2 –Q. 6)

Q. 2. Explain the following functions with syntax:- [5*4]
  I. putchar()
  II. fputs()
  III. malloc()
  IV. fscanf()
  V. gets()

Q. 3. WAP to reverse a number using recursive function.

Q. 4. What is difference between one way data communication and two way data communication? Explain with the help of example.

Q. 5. Why do we use pre-processor for a C program? What are the 3 different types of pre-processor directives? WAP using macros to find the greatest number out of two numbers

Q. 6. WAP to multiply 2 matrices. [Note: Take input for size of arrays from user].

SECTION-C

Attempt 2 Ques out of 3 Ques(Q.7 –Q. 9)

Q. 7.   WAP to print these patterns:-   [3+3]

a)   1   b)   *
                  1 1   **
                1 2 1   ***
              1 3   3 1   ****
            1 4 6   4 1

c) WAP to pass an entire 2-D array as argument to a function.   [4]

Q. 8. a) Find the output for the following:-   [4+6]

```
int a[7]={10,20,30,40,50,60,70};
int *ptr=a;
ptr++;
printf("%d",*(ptr+1));
printf("%d",*(a+2));
ptr++;
printf("%d",*(ptr+2));
printf("%d",&ptr);
```

b) Explain the difference between call by value and call by reference with the help of program.

Q9)   a) Write a program to compare two strings without using strcmp() function.   [5]

b) Write a program to dynamically allocate memory to 1-D array and input the values from the user and display the values.   [5]