ALCCS

Code: CS11 **Subject: COMPUTER PROGRAMMING & PROBLEM SOLVING THROUGH C**

Time: 3 Hours **Max. Marks: 100**

NOTE:

- **Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.**
- **Parts of a question should be answered at the same place.**

Q.1 a. What are the different data types available in C? Describe them briefly along with memory requirement.

b. Write a function to check whether a given year is a leap year or not.

c. What is the difference between *ptr++ and ++*ptr?

d. What are formal and actual parameters? Differentiate between them with the help of an example.

e. Write a function to check whether a string is a palindrome or not.

f. Differentiate between entry controlled and exit controlled loops with examples.

g. Write a function to swap two integers without using any temporary variable and any additional space.

(7 4)

Q.2 a. Explain preprocessor and directives.

b. Write a non-recursive function int fib(int n) that returns the n^{th} fibonacci number.

c. Why is a linked list called a dynamic data structure? What are the advantages of using linked lists over arrays?

(6+6+6)

Q.3 a. What is the difference between an enumeration and a set of processor #defines?

b. A positive integer is entered through the keyboard. Write a function to obtain the prime factors of this number. Modify the function suitably to obtain the prime factors recursively. **(8+10)**

Q.4 a. Using switch statement write a program to find out the roots of a quadratic equation.

b. Write a program to generate the following output.

```
A B C D E F G F E D C B A
A B C D E F   F E D C B A
A B C D E       E D C B A
A B C D           D C B A
A B C               C B A
A B                   B A
A                       A
```

(9+9)

Q.5 a. Among the functions fgets() and gets() which is safer to use and why?

b. Write a program to check weather a 3 3 matrix is symmetric or not. **(8+10)**

Q.6 a. What is the difference between formatted and unformatted console I/O?

b. Given two sorted lists where the first list is sorted in ascending order and the second list is sorted in descending order. Write a program to merge these two sorted list to obtain a sorted list in ascending order. **(8+10)**

Q.7 Write short notes on (Any **THREE**):

(i) File Handling.

(ii) Principles of documentation.

(iii) Passing an array as an argument.

(iv) Binary Search.

(6+6+6)