

Time: 2 hour

Max. Marks: 60

**NB: 1) Question No.1 is compulsory.**

**2) Attempt any three questions from question no. 2 to 6.**

**Q1 Solve any Three out Five of the following (5 marks each)**

**(15 marks)**

- A. Write an algorithm and draw flowchart to find the roots of quadratic equation.
- B. Write a C program to find frequency of characters in a string.
- C. Difference between Structure and Union.
- D. Write a program to check whether given year is leap year or not.
- E. What are logical operators in C.

**Q.2**

**(15 marks)**

- A. What is Recursion? Write a program to display factorial of number using recursion. **6M**
- B. Difference between while loop & do-while loop **4M**
- C. Explain basic data types in C along with their sizes and ranges **5M**

**Q.3**

**(15 marks)**

- A. Write user defined functions to implement following string operations **5M**
  - i. Strcat
  - ii. Strlen
- B. Explain bitwise operators with example. **4M**
- C. Write a program to print the following pattern. (Note- Not only 4 lines, it should print N lines taken from the user.) **6M**

```

      A
     B B
    C C C
   D D D D
    
```

**Q.4**

**(15 marks)**

- A. Explain switch case and if else ladder with example. **5 M**
- B. Write a program in C to find the smallest of N elements using an array. **5 M**
- C. Write a program to check whether a string is palindrome or not. **5M**

**Q.5**

**(15 marks)**

- A. A hospital needs to maintain details of patients. Details to be maintained are, First name, Middle name, Surname, Date of Birth, Disease. Write a C program which will print the list of all patients with given disease. **6 M**
- B. Explain the need of Function Prototype with example. **4M**
- C. Give the difference between entry and exit controlled loop with an example. **5M**

**Q.6**

**(15 marks)**

A. Write a program to find transpose of a matrix. **6M**

B. Write a program to print following star pattern. **5M**

```
*
* *
* * *
* * * *
* * * * *
```

C. What is an algorithm? Explain properties of an algorithm. **4M**

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