Total Marks: 50   **Duration: 2 hour**

<u>**N. B.:**</u>

- **Draw diagrams whenever necessary.**
- **Numbers to right indicate marks.**

<u>**Answer any five (5) questions from the following:**</u>   **5x10=50**

1. List all the bitwise operators available in C? What are the properties of recursive function? Recursive version or non-recursive version of a function, which one is better and why? Write a C function to calculate m^n where m and n should be the input to the function (without using any system function).   **2+2+2+4**

2. How a 2-D matrix represented in memory? Show with one example. Explain with proper example how do you pass an array as an argument to a function using call by reference method? Explain and find the output of the program?

   ```
   for(i=0;i<=10;i++) {
        if (i%2)
          continue;
        printf ("%d",i);}
   ```
                                                                   4+4+2

3. What is the main role of a constructor? Why the name of constructor is always same as the class name? With a suitable example define copy constructor of a class. Write a C++ program to perform constructor overloading and function overloading.   **2+1+3+4**

4. Write a program to determine whether an inputted character is a capital letter, a small case letter, a digit or a special symbol using conditional statements of C. What are the advantages and disadvantages of structure over union? What will be the memory size of a pointer variable and to which this value is dependent? Explain break and continue statements.   **4+2+2+2**

5. With example differentiate between function call by value and function call by reference. What is the need of function? How does a function can return an array? Write a function to calculate the length of a string without using the inbuilt function.   **3+2+2+3**

6. What the main advantages are of object oriented programming over structured oriented programming? What are the access specifiers in C++ class? What are the types and utilities of these? Write a C++ program to perform "-" operator overloading that will remove the common characters of two inputted words. If no common characters are present then it will concatenate those words. **2+3+5**

7. With example showcase function overriding and dynamic binding of C++. What is the use of friend class? Show with one example. If a function is declared as friend to a class will it reduce the data hiding capabilities of a class? Justify your answer. **5+3+2**