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| **SESSION** | **APRIL 2025** |
| **PROGRAM** | **BACHELOR OF COMPUTER APPLICATIONS (BCA)** |
| **SEMESTER** | **I** |
| **COURSE CODE & NAME** | **DCA1107 C PROGRAMMING** |
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Set-I

**1. Discuss about the following operators in C language with example.**

**a. Bitwise operators**

**b. Conditional Operator**

**c. Relational operator 4+3+3**

**Ans 1.**

**a. Bitwise Operators**

Bitwise operators in C are used to perform operations at the binary level. These operators manipulate individual bits of integer data types. The most commonly used bitwise operators include & (AND), | (OR), ^ (XOR), ~ (NOT), << (left shift), and >> (right shift). For example, if we have two integers a = 5 (0101 in binary) and b = 3 (0011 in binary), then a & b results in 1 (0001), because only the last bit is set in both. Similarly, a | b will return 7 (0111), and a ^ b will return 6 (0110). These operators are essential in systems programming and embedded systems where performance and memory efficiency are critical.

Bitwise shift operators move bits to the left or right. For instance, a << 1 shifts the bits of a one

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**Q2. Explain the different types of loop control statements in C. Provide syntax and example for each.**

**Ans 2.**

**Loop Control Statements**

Loop control statements in C are used to execute a block of code repeatedly until a given condition is met. C provides three main types of loop constructs: for, while, and do-while. These help in automating repetitive tasks efficiently.

**For Loop**

The for loop is used when the number of iterations is known beforehand. The syntax of a for loop is:

for(initialization; condition; increment) {

 // code to execute

}

Example:

**Q3. Explain the structure of a C program and outline the key features of the C programming language. 10**

**Ans 3.**

**Structure of a C Program**

A C program typically consists of the following components:

**Preprocessor Directives** – These include header files needed for the program. For example: #include <stdio.h>.

**Global Declarations** – These include global variables and function declarations used throughout the program.

**Main Function** – Every C program must have a main() function. It is the entry point of execution. Syntax:

**Set-II**

**Q4. What is recursion in C? Explain how recursive functions work and provide an example. 2+8**

**Ans 4.**

**Understanding Recursion in C**

Recursion in C refers to the process where a function calls itself either directly or indirectly to solve a problem. This technique is particularly useful when a problem can be divided into smaller sub-problems of the same type. Recursion simplifies code and reduces the need for complex looping structures, making the logic more elegant and readable. However, it must be used carefully, as excessive or uncontrolled recursion can lead to performance issues or even

**Q5. Explain the following string handling functions with examples.**

**a) strcmp() b) strlen( ) c) strcat() d) strcpy() 10**

**Ans 5.**

**Overview of String Handling Functions**

C provides a rich library of string handling functions that simplify the processing of character arrays. These functions are declared in the <string.h> header and allow programmers to compare, copy, concatenate, and measure strings easily. Strings in C are arrays of characters terminated with a null character '\0'.

**strcmp() – String Comparison**

The strcmp() function compares two strings character by character. It returns 0 if the strings are equal, a positive value if the first string is greater, and a negative value if the second string is

**Q6. Explain how functions can be combined with decision-making statements (like if, else, and switch) to solve problems. 10**

**Ans 6.**

**Combining Functions and Decision-Making**

Functions are the building blocks of structured programming in C. When combined with decision-making statements such as if, else, and switch, functions become even more powerful and flexible. This combination allows developers to break down complex logic into manageable units and control program flow based on different conditions. These constructs make the code modular, readable, and easy to debug.

**Using If and Else Inside Functions**

The if-else statements are used to execute different blocks of code depending on whether a