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| **SESSION** | **APRIL 2025** |
| **PROGRAM** | **MASTER OF COMPUTER APPLICATIONS (MCA)** |
| **SEMESTER** | **I** |
| **COURSE CODE & NAME** | **DCA6110** |
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**Set-I**

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

**a. Bitwise operators**

**b. Increment and decrement operators**

**c. Logical operators 4+3+3**

**Ans 1.**

**Operators in C Language**

**a. Bitwise Operators**

Bitwise operators in C are used to perform operations at the binary level. These operators operate on the individual bits of integer data types and are commonly used in system-level programming and embedded systems. The key bitwise operators include AND (&), OR (|), XOR (^), NOT (~), left shift (<<), and right shift (>>). These operators work only on integral data types such as int, char, and long.

For example:

int a = 5, b = 3;

int result = a & b; // result = 1 (0101 & 0011 = 0001)

Here, the bitwise AND operator compares each bit of a and b, and the result contains a 1 only

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**2. Explain the various decision control statements used in C programming, with syntax and suitable examples.**

**Ans 2.**

**Decision Control Statements in C**

**If Statement**

The if statement is the simplest decision control structure in C. It executes a block of code only if a specified condition evaluates to true. If the condition is false, the block is skipped.

Example:

int age = 20;

if (age >= 18) {

**3. Explain the concept of functions in C programming. Differentiate between library functions and user-defined functions with examples. 2+8**

**Ans 3.**

**Functions in C Programming**

**Concept of Functions in C**

Functions in C programming are blocks of code that perform specific tasks and can be called multiple times within a program. They are essential for organizing and structuring code in a modular fashion, enhancing readability, reusability, and maintainability. Functions help break down complex problems into smaller, manageable sub-tasks. Each function can accept inputs,

**Set-II**

**4. Explain the concept of arrays in C programming. How are arrays declared and initialized? Discuss with examples. 2+3+5**

**Ans 4.**

**Arrays in C Programming**

**Concept of Arrays in C**

An array in C programming is a collection of elements of the same data type stored in contiguous memory locations. It allows the programmer to store and manipulate multiple values using a single variable name, which is especially useful when working with large amounts of data. Each element in an array is accessed by an index, starting from 0. Arrays simplify the process of managing related data elements and are essential for loops and data structure implementations.

**Declaration of Arrays**

Declaring an array in C involves specifying the data type, array name, and the number of elements

**5. Explain malloc(), calloc(), realloc() and free() with an example for each. 10**

**Ans 5.**

**Dynamic Memory Functions in C**

**malloc() Function**

The malloc() function in C is used to dynamically allocate a block of memory during program execution. It stands for “memory allocation” and returns a void pointer to the first byte of the allocated memory. The size of memory to be allocated is specified in bytes. The memory allocated using malloc() contains garbage values and must be typecast to the appropriate pointer type.

Example:

**6. Explain the purpose of graphics.h in C. Write a program to draw a line, circle, and rectangle using in-built graphics functions. 2+8**

**Ans 6.**

**Purpose of graphics.h and Drawing Functions in C**

**Purpose of graphics.h in C**

The graphics.h header file in C provides access to in-built functions that enable drawing shapes and visual output on screen. It is primarily used in the Turbo C/C++ environment, which supports BGI (Borland Graphics Interface). The library contains functions to draw lines, circles, rectangles, arcs, and other graphical elements. The purpose of using graphics.h is to enhance the visual appearance of a program, simulate animations, or create GUI-based applications in DOS-based systems.

Although outdated for modern environments, graphics.h is still used in academic learning to