Theory Question

27\_jan\_se NAME: Vrinda Mavadhiya

## 1. What is a function in C++? Explain the concept of function declaration, definition, and calling.

**What is a function in C++? Explain the concept of function declaration, definition, and calling.**

A **function** in C++ is a block of code that performs a specific task and can be reused throughout a program. Functions help break down large programs into smaller, manageable, and modular pieces.

**Function Components:**

* **Function Declaration (Prototype):** Declares the function before it is used. It tells the compiler about the function’s name, return type, and parameters.

int add(int a, int b); // Declaration

* **Function Definition:** Contains the actual code (body) of the function.

int add(int a, int b)

{

return a + b;

}

* **Function Call:** Used to invoke the function in the main() or another function.

int result = add(5, 3);

## 2. What is the scope of variables in C++? Differentiate between local and global scope.

**What is the scope of variables in C++? Differentiate between local and global scope.**

**Scope** refers to the visibility and lifetime of a variable in a program.

**Local Scope:**

* A variable declared **inside** a function or block.
* Only accessible within that function or block.
* Destroyed once the function ends.

cpp

CopyEdit

void myFunction() {

int x = 10; // Local variable

}

**Global Scope:**

* A variable declared **outside** all functions.
* Accessible from **any function** in the program.
* Exists for the entire lifetime of the program.

cpp

CopyEdit

int y = 20; // Global variable

void myFunction() {

cout << y; // Accessing global variable

}

**3. Explain recursion in C++ with an example.**

**Recursion** is a programming technique where a function calls itself to solve smaller instances of a problem.

**Example: Factorial using recursion**

cpp

CopyEdit

#include <iostream>

using namespace std;

int factorial(int n) {

if (n <= 1) return 1;

return n \* factorial(n - 1); // Recursive call

}

int main() {

cout << "Factorial of 5 is: " << factorial(5);

return 0;

}

**Output:**

csharp

CopyEdit

Factorial of 5 is: 120

**4. What are function prototypes in C++? Why are they used?**

A **function prototype** is a declaration of a function that informs the compiler about the function’s name, return type, and parameters before its actual definition.

**Syntax:**

cpp

CopyEdit

return\_type function\_name(parameter\_list);

**Example:**

cpp

CopyEdit

int multiply(int, int); // Function prototype

int main() {

cout << multiply(2, 3);

}

int multiply(int a, int b) {

return a \* b;

}

**Why use function prototypes?**

* Ensures the compiler checks for correct function usage before the function is defined.
* Allows functions to be defined after main().