C++ Sample Paper - 1

1 Mark MCQ (10 Questions)

1. Which of the following is a valid C++ identifier?

   a) 2Variable

   b) _myVar

   c) new

   d) intVar@

2. The instruction cycle consists of:

   a) Fetch and Execute

   b) Decode and Execute

   c) Fetch, Decode, Execute, and Store

   d) Fetch, Decode, and Execute

3. What is the size of an integer variable in C++ (assuming a 32-bit system)?

   a) 2 bytes

   b) 4 bytes

   c) 8 bytes

   d) System-dependent

4. Which keyword is used to declare a class in C++?

   a) struct

   b) class

   c) object

   d) define

5. Which of the following is used to declare a pointer?

   a) &

   b) *

c) →

d) $

6. What is the output of `cout << 10 / 3;` in C++?

    a) 3.33

    b) 3

    c) 3.0

    d) Error

7. Which of the following is a fundamental principle of Object-Oriented Programming?

    a) Encapsulation

    b) Abstraction

    c) Polymorphism

    d) All of the above

8. In a function prototype, what does the return type indicate?

    a) The type of arguments

    b) The type of the function name

    c) The type of value the function returns

    d) The number of parameters

9. What is the correct syntax for declaring an array of pointers?

    a) `int *arr[10];`

    b) `int arr[*10];`

    c) `int *arr = new int[10];`

    d) `int arr[10];`

10. What is the primary difference between a deep copy and a shallow copy in C++?
    a) A deep copy duplicates objects stored in memory, while a shallow copy only copies references
    b) A deep copy only copies references, while a shallow copy duplicates objects in memory
    c) Both are the same
    d) A shallow copy does not use dynamic memory allocation

2 Marks MCQ (5 Questions)

(Easy)

1. What does the following statement do?

```
int *ptr = new int;
```

   a) Allocates memory dynamically for an integer

   b) Creates a pointer without initialization

   c) Creates an array of integers

   d) Deletes a pointer

2. What is the output of the following code?

```
int x = 5;
int &y = x;
y = 10;
cout << x;
```

   a) 5

   b) 10

   c) Compiler Error

   d) Undefined Behavior

3. What is the purpose of the `this` pointer in C++?

   a) It points to the parent class

   b) It points to the calling object

   c) It points to a static variable

   d) It stores the address of a pointer

1. What will happen if `delete` is called twice on the same pointer?
   a) The program will crash
   b) Undefined behavior will occur
   c) Memory will be freed twice
   d) No effect

5. Which of the following is true about a class in C++?

a) A class is a blueprint for creating objects
b) A class is an actual instance in memory
c) A class cannot have functions inside it
d) A class must always have at least one object

5 Marks Coding Question (Medium)

Problem Statement:

Write a C++ program to reverse an integer array using pointers.

Input:

- The first line contains an integer `n` (1 ≤ n ≤ 100), representing the size of the array.

- The second line contains `n` space-separated integers.

Output:

- Print the reversed array using pointer manipulation.

Constraints:

- Do not use built-in functions like `reverse()`.

- Use pointer arithmetic instead of array indexing.

10 Marks Coding Question (Hard)

Problem Statement:

Design a **Bank Account** class that supports deposit, withdrawal, and balance checking.

Input:

- The first line contains an integer `N` (1 ≤ N ≤ 100), representing the number of operations.

- The next `N` lines contain either:

  - `"deposit X"` (where `X` is the amount to deposit)

  - `"withdraw X"` (where `X` is the amount to withdraw)

- ○ `"balance"` (to print the current balance)

Output:

- Print the balance after each `"balance"` command.

Constraints:

- Initial balance is `0`.
- If withdrawal exceeds the balance, print `"Insufficient funds"`.
- Use **class and objects**.

5 Marks Coding Question (Medium)

Write a C++ function to find the second largest element in an integer array.

Input:

- The first line contains an integer `n` (2 ≤ n ≤ 100), representing the size of the array.
- The second line contains `n` space-separated integers.

Output:

- Print the second largest element.

Constraints:

- Do not use sorting.
- Use only one traversal of the array.

10 Marks Coding Question (Hard)

Problem Statement:

Create a **Student Management System** where students have a name, roll number, and marks. Implement functions for:

- Adding a student
- Displaying student details
- Finding the highest marks

Input:

- The first line contains an integer `N` (1 ≤ N ≤ 100), representing the number of students.
- The next `N` lines contain `"Name RollNumber Marks"`.

Output:

- Print student details.
- Print the student with the highest marks.

Constraints:

- Name is a string of max 50 characters.
- Roll number is unique.
- Marks are between 0 and 100.
- Use **classes and objects**.