

# C++ Questions & Answers

1. What is C++?

- C++ is a general-purpose, object-oriented programming language.

2. What are the features of C++?

- Object-oriented, fast execution, memory management, and high performance.

3. What is the difference between C and C++?

- C is procedural, while C++ supports object-oriented programming.

4. What is an object in C++?

- An object is an instance of a class.

5. What is encapsulation?

- Encapsulation bundles data and functions into a class.

6. What is inheritance?

- Inheritance allows a class to acquire properties of another class.

7. What is polymorphism?

- Polymorphism allows the same function to behave differently.

8. What is an abstract class?

- A class that cannot be instantiated and contains at least one pure virtual function.

9. What is a virtual function?

- A function that can be overridden in derived classes.

10. What is the difference between function overloading and function overriding?

- Overloading is defining multiple functions with the same name but different parameters, while overriding redefines a function in a derived class.

11. What is a constructor?

- A special function used to initialize an object.

12. What is a destructor?

- A special function used to clean up when an object is destroyed.

13. What is a friend function?

- A function that has access to private and protected members of a class.

14. What is operator overloading?

- The ability to define custom behavior for operators.

15. What is multiple inheritance?

- When a class inherits from more than one class.

16. What is a template in C++?

- A blueprint for creating generic functions or classes.

17. What is the STL?

- The Standard Template Library provides common data structures and algorithms.

18. What is a namespace?

- A way to group related code to avoid naming conflicts.

19. What is `this` pointer?

- A pointer that refers to the calling object.

20. What is `new` and `delete`?

- `new` allocates memory dynamically, and `delete` deallocates it.

21. What is a shallow copy and deep copy?

- A shallow copy copies references, while a deep copy duplicates objects.

22. What is the difference between `public`, `private`, and `protected`?

- `public` allows access from anywhere, `private` restricts access, and `protected` allows access to derived classes.

23. What is a static variable?

- A variable shared by all instances of a class.

24. What is `const` in C++?

- A keyword that makes a variable unmodifiable.

25. What is a function pointer?

- A pointer that points to a function.

26. What is RAI?

- Resource Acquisition Is Initialization, a technique to manage resources.

27. What is exception handling in C++?

- Using `try`, `catch`, and `throw` to handle errors.

28. What is `auto` in C++?

- A keyword for type inference.

29. What is `decltype`?

- A keyword to get the type of an expression.

30. What is move semantics in C++?

- A technique to transfer ownership of resources efficiently.