Dr. C#: Basic Interview Questions & Answers

1. What is C#?

Answer: C# is a modern, object-oriented programming language developed by Microsoft for building various types of applications on the .NET platform.

2. What are the main features of C#?

Answer: Features include object-oriented programming, type safety, garbage collection, LINQ, asynchronous programming, and cross-platform support with .NET Core.

3. What is the difference between int and Int32?

Answer: There is no difference. 'int' is an alias for System.Int32 in C#.

4. What is the difference between value types and reference types?

Answer: Value types store data directly; reference types store a reference to the data's memory address.

5. What are boxing and unboxing in C#?

Answer: Boxing converts a value type to object; unboxing extracts the value type from the object.

6. What is a class and an object in C#?

Answer: A class is a blueprint; an object is an instance of a class.

7. What is the difference between public, private, protected, and internal access modifiers?

Answer: public: accessible everywhere; private: only within the class; protected: within the class and derived classes; internal: within the same assembly.

8. What is the difference between static and instance members?

Answer: Static members belong to the class; instance members belong to an object.

9. What is the difference between const, readonly, and static readonly in C#?

Answer: const is compile-time constant, readonly is set at runtime, static readonly is shared among instances and set at runtime.

10. What is a constructor in C#? What are its types?

Answer: A constructor initializes an object. Types: default, parameterized, static, private.

11. Can you overload a constructor in C#?

Answer: Yes, by defining multiple constructors with different parameters.

12. What is method overloading?

Answer: Having multiple methods with the same name but different parameters.

13. What is method overriding? How is it different from overloading?

Answer: Overriding replaces a base class method using the 'override' keyword; overloading changes method signature.

14. What is inheritance in C#?

Answer: Inheritance allows a class to inherit fields and methods from another class.

15. What is the difference between abstract class and interface?

Answer: Abstract class can have implementation; interface cannot. A class can implement multiple interfaces but only inherit one class.

16. What is polymorphism in C#?

Answer: Polymorphism allows methods to behave differently based on the object (compile-time and run-time).

17. What is encapsulation?

Answer: Encapsulation hides internal details and only exposes what's necessary using properties or methods.

18. What is the use of the this keyword in C#?

Answer: 'this' refers to the current instance of the class.

19. What is the base keyword in C#?

Answer: 'base' is used to access members of the base class.

20. What is the difference between == and .Equals()?

Answer: '==' checks for reference equality (by default), '.Equals()' checks for value equality (can be overridden).

21. What are properties in C#? How are they different from fields?

Answer: Properties are accessors for fields; fields store data directly.

22. What is a delegate in C#?

Answer: A delegate is a type-safe function pointer used to encapsulate methods.

23. What is an event in C#?

Answer: An event is a mechanism to notify subscribers when something happens.

24. What is exception handling? Name some common exception types.

Answer: It handles runtime errors. Common types: NullReferenceException, DivideByZeroException, FormatException.

25. What is the difference between Array and List in C#?

Answer: Array has fixed size; List is dynamic and provides more features.