1) What are the 4 pillars of OOPs in Java?

The four pillars are:

- Encapsulation: Bundling data and methods.

- Inheritance: Reusing code via parent-child relationships.

- Polymorphism: One interface, many implementations.

- Abstraction: Hiding implementation details.

2) What is the difference between Abstraction and Encapsulation?

- Abstraction hides implementation details (focuses on what).

- Encapsulation binds data and methods (focuses on how).

3) What is Inheritance in Java?

Inheritance allows a class to acquire properties and behavior from another class using 'extends'. Enables code reuse.

4) What is Polymorphism in Java?

Polymorphism means one name, many forms.

- Compile-time (method overloading)

- Runtime (method overriding)

5) What is method overloading?

Same method name with different parameter lists in the same class. It's compile-time polymorphism.

6) What is method overriding?

Subclasses provide specific implementation of a method defined in the parent class. It's runtime polymorphism.

7) Can we override static methods?

No, static methods belong to the class, not to objects. They can be hidden, not overridden.

8) What is the use of super keyword?

'super' refers to the immediate parent class. It can be used to access parent methods, constructors,

or variables.

9) What is an interface in Java?

An interface is a blueprint of a class. It contains abstract methods (Java 8+ supports default, static, and private methods).

10) Can interfaces have static methods?

Yes, since Java 8, interfaces can have static methods, which are not inherited by implementing classes.

11) Can we instantiate an interface?

No, interfaces cannot be instantiated directly. They must be implemented by a class.

12) What is the difference between abstract class and interface?

- Abstract class can have constructors, state, non-abstract methods.
- Interface can't have constructors and fields (only constants).
- A class can implement multiple interfaces but can extend only one class.

13) Can we declare constructors in interfaces?

No, interfaces cannot have constructors.

14) What are default methods in interfaces?

From Java 8, interfaces can have default methods with a body. Useful for backward compatibility.

15) What is multiple inheritance in Java?

Java supports multiple inheritance with interfaces, not classes. This avoids the diamond problem.

16) What is the instanceof keyword?

'instanceof' checks if an object is an instance of a class or subclass or implements an interface.

17) What is final keyword in Java?

- final variable: constant
- final method: cannot be overridden
- final class: cannot be subclassed

18) What is the difference between static and instance methods?

- Static: belongs to the class, called using class name

- Instance: belongs to the object, requires object reference

19) Can abstract classes have static methods?

Yes, abstract classes can have static methods, just like regular classes.

20) What is object slicing in Java?

Java does not support object slicing like C++. Subclass object passed to superclass reference retains full data.