Q1: What is the primary purpose of inheritance in Java?

A) To hide implementation details

B) To allow code reuse and hierarchical classification

C) To prevent method overriding

D) To enforce encapsulation

Q2: Which keyword is used to implement inheritance in Java?

A) `extends`

B) `implements`

C) `inherits`

D) `super`

Q3: What happens if a subclass and superclass have a method with the same name and parameters?

A) Compile-time error

B) Runtime error

C) Method overriding occurs

D) Method overloading occurs

Q4: Polymorphism in Java allows:

A) A subclass object to be treated as a superclass object

B) A class to have multiple constructors

C) A method to have multiple return types

D) Variables to change data types dynamically

Q5: Which concept enables runtime polymorphism in Java?

A) Method overloading

B) Method overriding

C) Static methods

D) Private methods

Answer: B) Method overriding

Q6: Which keyword is used to achieve abstraction in Java?

A) `final`

B) `abstract`

C) `static`

D) `private`

Q7: Encapsulation in Java is achieved using:

A) Inheritance

B) Private fields with public getters/setters

C) Method overloading

D) Static methods

Q8: What is the purpose of the `finally` block in exception handling?

A) To handle exceptions

B) To execute code regardless of whether an exception occurs

C) To replace the `catch` block

D) To throw a new exception

Q9: Which exception is thrown when dividing by zero?

A) `NullPointerException`

B) `ArithmeticException`

C) `ArrayIndexOutOfBoundsException`

D) `IOException`

Q10: Which method checks if a string starts with a specified prefix?

A) `endsWith()`

B) `contains()`

C) `startsWith()`

D) `matches()`

Q11: What does `"Hello".substring(1, 3)` return?

A) `"Hel"`

B) `"ell"`

C) `"el"`

D) `"llo"`

Q12: Which access modifier allows access only within the same package?

A) `public`

B) `private`

C) `protected`

D) Default (no modifier)

Q13: A `private` method in a superclass:

A) Can be inherited and overridden

B) Cannot be accessed by subclasses

C) Can be accessed using reflection

D) Must be declared `final`

Q14: Which class is used to read text from a file in Java?

A) `FileWriter`

B) `BufferedReader`

C) `FileOutputStream`

D) `ObjectInputStream`

Q15: Which method is used to start a thread in Java?

A) `run()`

B) `start()`

C) `execute()`

D) `launch()`

Q16: Which SOLID principle states that a class should have only one reason to change?

A) Single Responsibility Principle (SRP)

B) Open/Closed Principle (OCP)

C) Liskov Substitution Principle (LSP)

D) Interface Segregation Principle (ISP)

Q17: Which of the following best describes the Single Responsibility Principle (SRP)**?**

A) A class should have multiple methods to handle different tasks.

B) A class should have only one reason to change, meaning it should have only one job.

C) A class should be open for extension but closed for modification.

D) A class should depend on abstractions, not concrete implementations.

Q18: According to the Open/Closed Principle (OCP)**,** how should a class be designed?

A) A class should allow modifications to existing code for new features.

B) A class should be open for extension but closed for modification.

C) A class should have only one public method.

D) A class should never use inheritance.

Q19: What does the Liskov Substitution Principle (LSP) state?

A) Subclasses should never override superclass methods.

B) Objects of a superclass should be replaceable with objects of a subclass without breaking the program.
C) A class should depend on another class’s concrete implementation.
D) A subclass must add new methods not present in the superclass.

Q20: The Dependency Inversion Principle (DIP) suggests that:
A) High-level modules should depend on low-level modules.
B) Classes should depend on concrete implementations rather than abstractions.
C) High-level modules should not depend on low-level modules; both should depend on abstractions.
D) A class should have only one dependency.