

Basic Concepts

1. What is Java?

- Explain what Java is and its primary features.

2. What is the Java Virtual Machine (JVM)?

- Describe the role of the JVM in the Java ecosystem.

3. What are the main differences between JDK, JRE, and JVM?

- Explain the differences and purposes of each.

4. What is a Class in Java?

- Define what a class is and its purpose in object-oriented programming.

5. What is an Object in Java?

- Explain what an object is and how it relates to classes.

Object-Oriented Programming (OOP) Concepts

6. What are the four main principles of Object-Oriented Programming?

- Define encapsulation, inheritance, polymorphism, and abstraction.

7. What is inheritance in Java?

- Explain how inheritance works and give an example.

8. What is polymorphism in Java?

- Describe polymorphism and provide an example.

9. What is encapsulation in Java?

- Explain encapsulation and its benefits.

10. What is abstraction in Java?

- Describe abstraction and how it is implemented in Java.

Language Constructs

11. What is the difference between an abstract class and an interface?

- Compare and contrast abstract classes and interfaces.

12. What is a constructor in Java?

- Explain the purpose of a constructor and how it differs from a method.

13. What is the difference between method overloading and method overriding?

- Define and provide examples of both concepts.

14. What are static methods and variables?

- Explain the significance of the static keyword.

15. What is a final keyword in Java?

- Describe the use of final with variables, methods, and classes.

Exception Handling

16. What is exception handling in Java?

- Explain the purpose of exception handling and the keywords used.

17. What is the difference between checked and unchecked exceptions?

- Define and provide examples of both types of exceptions.

18. What are the keywords try, catch, finally, and throw used for?

- Describe the role of each keyword in exception handling.

19. How do you create a custom exception in Java?

- Provide an example of a custom exception class.

Collections and Generics

20. What are generics in Java?

- Explain the purpose and use of generics.

21. What is the Collections framework in Java?

- Describe the Collections framework and its importance.

22. What is the difference between ArrayList and LinkedList?

- Compare and contrast these two List implementations.

23. What is the difference between a Set and a List?

- Highlight the key differences between these two collection types.

Concurrency

25. What is a thread in Java?

- Explain what a thread is and how it's used.

26. What is the difference between Runnable and Thread?

- Describe the differences and when to use each.

27. What is synchronization in Java?

- Explain the concept of synchronization and why it's important in multithreading.