THEORY TEST 1

Java Basics

1. Which of the following is an example of a Procedure Oriented Programming language?
   a) Java
   b) Python
   c) C
   d) Smalltalk
2. What is a key feature of Object-Oriented Programming?
   a) Functions are written separately
   b) Data and functions are wrapped into a single unit
   c) Code cannot be reused
   d) It has no security features
3. Which of the following is NOT a principle of OOP?
   a) Abstraction
   b) Inheritance
   c) Compilation
   d) Polymorphism
4. What is the correct extension for a Java source file?
   a) .java
   b) .class
   c) .exe
   d) .txt
5. Which Java feature allows it to run on different platforms without modification?
   a) Platform dependent
   b) Machine dependent
   c) Write Once, Run Anywhere (WORA)
   d) Hardware dependent

Java Compilation & Execution

6. What is the purpose of the Java compiler?
   a) Converts source code to bytecode
   b) Executes Java programs
   c) Converts Java code into machine code directly
   d) Debugs Java programs
7. What is Bytecode in Java?
   a) The final executable file
   b) A machine code format
   c) Intermediate code interpreted by JVM
   d) A low-level assembly code
8. What does the Java Virtual Machine (JVM) do?
   a) Compiles Java programs
   b) Converts bytecode into machine code

c) Runs only Windows applications

d) Converts Java into Python

9. What is the function of the Just-In-Time (JIT) compiler?

a) Debugs Java programs

b) Converts Java to Python

c) Optimizes bytecode execution

d) Compiles Java programs into C++

10. What is the first step of Java program execution?

a) Running the JVM

b) Writing the Java code

c) Compiling to machine code

d) Debugging the source code

Java Language Features

11. Which of the following is NOT a Java keyword?

a) while

b) new

c) class

d) main

12. What does the import keyword do in Java?

a) Imports external files

b) Includes Java libraries in the program

c) Loads a package at runtime

d) Declares variables

13. What symbol is used to indicate a single-line comment in Java?

a) //

b) /* */

c) #

d) --

14. What does System.out.println(); do?

a) Takes input from the user

b) Prints output on the screen

c) Executes a loop

d) Terminates a program

15. Which of the following is a valid Java identifier?

a) 123var

b) _myVariable

c) @hello

d) class

Java Data Types & Variables

16. Which of the following is NOT a primitive data type in Java?

a) int

b) double

c) String

d) boolean

17. What is the default value of a boolean variable in Java?

a) true

b) false

c) 0

d) null

18. How many bytes does an int take in Java?

a) 1

b) 2

c) 4

d) 8

19. Which data type is used to store decimal numbers in Java?

a) int

b) double

c) char

d) boolean

20. What is the correct way to declare a character variable?

a) char ch = "A";

b) char ch = 'A';

c) char ch = A;

d) char ch = A;

Java Operators & Expressions

21. What is the modulus operator (%) used for?

a) Multiplication

b) Division

c) Finding remainder

d) Exponentiation

22. Which operator is used for logical AND in Java?

a) &

b) &&

c) |

d) ||

23. What will 5 + 2 * 3 evaluate to?

a) 21

b) 11

c) 15

d) 10

24. What is the function of the += operator?

a) Subtracts and assigns

b) Adds and assigns

c) Divides and assigns

d) Multiplies and assigns

25. What is the output of System.out.println(10 / 3);?

a) 3.33

b) 3

c) 10

d) 0

Control Statements

26. What does an if statement check?

a) A condition

b) A loop

c) An array

d) A package

27. What is the main difference between while and do-while loops?

a) while executes at least once

b) do-while executes at least once

c) while is exit-controlled

d) do-while runs infinitely

28. Which statement is used to terminate a loop early?

a) stop

b) exit

c) break

d) return

29. What keyword is used for multiple branching in Java?

a) switch

b) case

c) else

d) goto

30. In a for loop, which part is executed first?

a) Condition

b) Increment

c) Initialization

d) Body of the loop

Arrays & Strings

31. What is an array?

a) A collection of different data types

b) A collection of similar data types

c) A method to store characters

d) A part of the compiler

32. What is the starting index of an array in Java?

a) 0

b) 1

c) -1

d) Any number

33. Which of the following functions is used to find the length of a string?

a) size()

b) length()

c) count()

d) index()

34. What does equalsIgnoreCase() do?

a) Compares two strings while ignoring case

b) Converts a string to lowercase

c) Checks if a string is empty

d) Replaces characters in a string

35. What does charAt() return?

a) A substring

b) A character at a given index

c) The length of a string

d) A boolean value

Classes & Objects

36. What is a class in Java?

a) A blueprint for objects

b) A variable

c) A function

d) A data type

37. What is an object in Java?

a) A collection of classes

b) An instance of a class

c) A data type

d) A package

38. What is a constructor used for?

a) Declaring variables

b) Executing loops

c) Initializing objects

d) Importing classes

39. What does the new keyword do?

a) Declares a variable

b) Creates a new object

c) Imports a class

d) Defines a function

40. What is method overloading?

a) Using multiple classes

b) Defining multiple methods with the same name but different parameters

c) Creating multiple objects

d) Using multiple constructors

ANSWER THE FOLLOWING IN ONE OR TWO SENTENCES

1. What is Object-Oriented Programming (OOP)?

2. Define polymorphism in Java.

3. What is the purpose of the Java Virtual Machine (JVM)?

4. Explain the concept of "Write Once, Run Anywhere" (WORA) in Java.

5. What is bytecode in Java?

6. Differentiate between a compiler and an interpreter.

7. What is the role of the import keyword in Java?

8. Define a variable in Java.

9. What are literals in Java? Give an example.

10. Explain the difference between while and do-while loops.

11. What is a switch case, and when is it used?

12. Define an array in Java.

13. What is the function of System.out.println(); in Java?

14. What are primitive data types in Java? Name any four.

15. Explain the purpose of a constructor in Java.

16. What is the difference between == and .equals() in Java?

17. How does the charAt() method work in Java?

18. What is method overloading?

19. What does the trim() function do in Java?

20. What is a wrapper class in Java? Give an example.

WRITE JAVA PROGRAMS FOR THE FOLLOWING

a) Write a Java program to print the first 10 numbers in the Fibonacci series using a for loop.

b) Write a Java program to check if a given number is even or odd using an if-else statement.

c) Write a Java program to find the largest element in an array of n integers entered by the user

d) Write a Java program that takes a string as input and counts the number of vowels in it.

e) Write a Java program with two overloaded methods named calculateArea(), one to find the area of a square and another to find the area of a rectangle.

f) Create a Java class called Student with attributes name, rollNumber, and marks. Write a program to create an object of the Student class, take input for these attributes, and display them.