**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**

1. 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
2. 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
3. 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
4. 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++
5. 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**

1. Which of the following is NOT a Java keyword?  
   a) while  
   b) new  
   c) class  
   d) main
2. 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
3. What symbol is used to indicate a single-line comment in Java?  
   a) //  
   b) /\* \*/  
   c) #  
   d) --
4. 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
5. Which of the following is a valid Java identifier?  
   a) 123var  
   b) \_myVariable  
   c) @hello  
   d) class

**Java Data Types & Variables**

1. Which of the following is NOT a primitive data type in Java?  
   a) int  
   b) double  
   c) String  
   d) boolean
2. What is the default value of a boolean variable in Java?  
   a) true  
   b) false  
   c) 0  
   d) null
3. How many bytes does an int take in Java?  
   a) 1  
   b) 2  
   c) 4  
   d) 8
4. Which data type is used to store decimal numbers in Java?  
   a) int  
   b) double  
   c) char  
   d) boolean
5. 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**

1. What is the modulus operator (%) used for?  
   a) Multiplication  
   b) Division  
   c) Finding remainder  
   d) Exponentiation
2. Which operator is used for logical AND in Java?  
   a) &  
   b) &&  
   c) |  
   d) ||
3. What will 5 + 2 \* 3 evaluate to?  
   a) 21  
   b) 11  
   c) 15  
   d) 10
4. What is the function of the += operator?  
   a) Subtracts and assigns  
   b) Adds and assigns  
   c) Divides and assigns  
   d) Multiplies and assigns
5. What is the output of System.out.println(10 / 3);?  
   a) 3.33  
   b) 3  
   c) 10  
   d) 0

**Control Statements**

1. What does an if statement check?  
   a) A condition  
   b) A loop  
   c) An array  
   d) A package
2. 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
3. Which statement is used to terminate a loop early?  
   a) stop  
   b) exit  
   c) break  
   d) return
4. What keyword is used for multiple branching in Java?  
   a) switch  
   b) case  
   c) else  
   d) goto
5. In a for loop, which part is executed first?  
   a) Condition  
   b) Increment  
   c) Initialization  
   d) Body of the loop

**Arrays & Strings**

1. 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
2. What is the starting index of an array in Java?  
   a) 0  
   b) 1  
   c) -1  
   d) Any number
3. Which of the following functions is used to find the length of a string?  
   a) size()  
   b) length()  
   c) count()  
   d) index()
4. 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
5. 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**

1. What is a class in Java?  
   a) A blueprint for objects  
   b) A variable  
   c) A function  
   d) A data type
2. What is an object in Java?  
   a) A collection of classes  
   b) An instance of a class  
   c) A data type  
   d) A package
3. What is a constructor used for?  
   a) Declaring variables  
   b) Executing loops  
   c) Initializing objects  
   d) Importing classes
4. What does the new keyword do?  
   a) Declares a variable  
   b) Creates a new object  
   c) Imports a class  
   d) Defines a function
5. 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**

1. Write a Java program to print the first 10 numbers in the Fibonacci series using a for loop.
2. Write a Java program to check if a given number is even or odd using an if-else statement.
3. Write a Java program to find the largest element in an array of n integers entered by the user
4. Write a Java program that takes a string as input and counts the number of vowels in it.
5. 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.
6. 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.