## Chapter-2: Variables and Operators

## PART-II: SAMPLE SHORT QUESTIONS

**1. What is the syntax of variable?**

A variable is declared with a **data type, name, and optional value**.
It stores data in memory during program execution.
✓ Example: int age = 20;

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**2. Define and explain identifier?**

An identifier is the **name of variables, classes, or methods**.
It must follow rules: start with letter, case-sensitive, not keyword.
✓ Example: studentName, totalMarks.

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**3. What are comments?**

Comments are **non-executable notes** for programmers.
Java supports single-line, multi-line, and documentation comments.
✓ Example: // This is a comment.

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**4. Define literals?**

Literals are **constant fixed values** used in code.
They can be numeric, character, string, or boolean.
✓ Example: 10, 'A', "Hello", true.

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**5. Define keyword?**

Keywords are **reserved words** with special meaning in Java.
They cannot be used as identifiers.
✓ Example: int, class, while.

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**6. Define operator and its types?**

An operator is a **symbol that performs operations** on data.
Types: Arithmetic, Relational, Logical, Bitwise, Assignment, Unary, Ternary.
✓ Example: a + b.

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**7. Define arithmetic operator?**

Used for **basic calculations** like add, subtract, multiply, divide.
Symbols: +, -, *, /, %.
✓ Example: 10 % 3 = 1.

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**8. Define relational operator?**

Used to **compare values** and return boolean result.
Operators: ==, !=, <, >, <=, >=.
✓ Example: a > b.

**9. Define logical operator?**

Used for **logical conditions** on boolean values.
Operators: &&, ||, !.
✓ Example: (x > 0 && y > 0).

**10. Define bitwise operator?**

They work on **binary bits** of numbers.
Operators: &, |, ^, ~, <<, >>.
✓ Example: 5 & 3 = 1.

**11. Define increment operator?**

It increases the value of variable by 1.
Forms: prefix ++x and postfix x++.
✓ Example: int a=5; a++; //6.

**12. Define decrement operator?**

It decreases the value of variable by 1.
Forms: prefix --x and postfix x--.
✓ Example: int a=5; a--; //4.

**13. What is prefix operator?**

Operator is written **before the operand**.
Value is updated first, then used.
✓ Example: int a=5; int b=++a; //a=6,b=6.

**14. What is postfix operator?**

Operator is written **after the operand**.
Value is used first, then updated.
✓ Example: int a=5; int b=a++; //a=6,b=5.

**15. What is prefix decrement operator?**

Decreases value first, then uses it in expression.
Placed before variable --x.
✓ Example: int a=5; int b=--a; //a=4,b=4.

**16. Define postfix decrement operator?**

Uses current value first, then decreases by 1.
Placed after variable x--.
✓ Example: int a=5; int b=a--; //a=4,b=5.

**17. Define assignment operator?**

Used to **assign values** to variables.
Operators: =, +=, -=, *=, /=, %=.
✓ Example: x += 5; // x=x+5.

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**18. Define unary operator?**

Works on **a single operand only**.
Includes +, -, ++, --, !.
✓ Example: int x=5; -x = -5.

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**19. What is ternary operator?**

A conditional operator with ? : syntax.
Returns value based on condition.
✓ Example: int max = (a>b) ? a : b;.

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**20. What is modulus operator?**

It returns the **remainder** after division.
Symbol: %.
✓ Example: 10 % 3 = 1.

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**PART-III: SAMPLE LONG QUESTIONS**

**1. Describe Primitive Data Types.**

Java has **8 primitive types**: byte, short, int, long, float, double, char, boolean.
They store simple values like numbers, characters, or true/false.
✓ Example: int age=20; boolean isOn=true;.

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**2. Explain Arithmetic Operators.**

They perform **basic math operations** like +, -, *, /, %.
Used on numeric values to calculate results.
✓ Example: int a=10,b=3; System.out.println(a/b); //3.

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**3. Define Increment or Decrement Operators.**

Increment (++) adds 1, Decrement (--) subtracts 1.
Can be used as prefix or postfix.
✓ Example: int a=5; a++; //6.

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**4. Describe Comparison Operators.**

They compare two values and return boolean (true/false).
Operators: ==, !=, <, >, <=, >=.
✓ Example: int x=5,y=7; System.out.println(x<y); //true.

**5. Describe Boolean Operators.**

Work with true/false values for decision making.
Operators: && (AND), || (OR), ! (NOT).
✓ Example: (5>2 && 7>3) // true.

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**6. Explain Boxing and Unboxing Conversions.**

Boxing converts primitive → wrapper class, unboxing reverses it.
Java supports **auto-boxing/unboxing**.
✓ Example: Integer obj=10; int x=obj;.