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1. What is an expression in Java?
    a. A line of comment
    b. A line of code that performs an action
    c. A line that only stores values
    d. A line that declares variables

    Ans: b. A line of code that performs an action

    Explanation: An expression consists of operands and operators. It produces a single value after evaluation.

2. What is the purpose of an operator in Java?
    a. To define a method
    b. To modify access specifier
    c. To perform a task on operands
    d. To call a function

    Ans: c. To perform a task on operands

    Explanation: Operators work on operands to perform computations. Examples include +, -, =, etc.

3. In the expression x = a + b;, which are the operands?
    a. =, +, x
    b. x, a, b
    c. a, +, b
    d. Only a and b

    Ans: b. x, a, b

    Explanation: Operands are values or variables on which operations are performed. In this expression, x, a, and b are operands.

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4. In the expression x = a + b;, what are = and +?
    a. Keywords
    b. Values
    c. Operators
    d. Functions

    Ans: c. Operators

    Explanation: = is an assignment operator, and + is an arithmetic operator.
5. Which of the following is not a valid operand in Java?
    a. Variable
    b. Constant
    c. Keyword
    d. Literal

    Ans: c. Keyword

    Explanation: Keywords have predefined meanings in Java. They cannot be used as operand values.
6. What is the output of 12 * 10 in terms of Java expression?
    a. 120
    b. 121
    c. 10
    d. Compilation error

    Ans: a. 120

    Explanation: Both 12 and 10 are operands, and * is the arithmetic multiplication operator. The result is 120.

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7. Which operator represents a positive value in Java?
    a. +
    b. ++
    c. !
    d. *

Ans: a. +

Explanation: Unary plus is used to indicate positive values. However, it's often optional.

8. What is the purpose of the "-" unary operator?
    a. Convert a value to float
    b. Reverse a string
    c. Represent a negative value
    d. Multiply a value

Ans: c. Represent a negative value

Explanation: The unary minus changes a positive number into a negative one. For example, -99.

9. How many operands does a unary operator require?
    a. Two
    b. Three
    c. One
    d. None

Ans: c. One

Explanation: Unary operators need only one operand.

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10. Which operator increases a variable by 1?
    a. --
    b. ++
    c. **
    d. ^^

Ans: b. ++

Explanation: The increment operator (++) adds 1 to the operand. It can be used before or after the variable.

11. What does x = ++a; do?
    a. Assigns current value of a
    b. Increments a after assignment
    c. Increments a before assignment
    d. Does nothing

Ans: c. Increments a before assignment

Explanation: Pre-increment increases the value of a first. Then it assigns that value to x.

12. What does x = a++; do?
    a. Decreases a
    b. Increments before assignment
    c. Assigns current a, then increments
    d. Error

Ans: c. Assigns current a, then increments

Explanation: Post-increment assigns the current value first. Then it increases the variable by 1.

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13. What is the result of ++x when x is 9?
    a. 9
    b. 10
    c. 11
    d. 8

    Ans: b. 10

    Explanation: Pre-increment increases the value first, so x becomes 10.

14. What is the result when y = x++ and x = 11?
    a. y = 11, x = 12
    b. y = 12, x = 12
    c. y = 10, x = 11
    d. y = 12, x = 13

    Ans: a. y = 11, x = 12

    Explanation: Post-increment uses the value first (11), then increments x to 12.

15. Which operator is used to reduce a variable's value by 1?
    a. --
    b. ++
    c. -
    d. ==

    Ans: a. --

    Explanation: Decrement operator subtracts 1 from the operand. It also has pre and post forms.

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16. Is the expression int a = ++(++b); valid in Java?
    a. Yes
    b. No
    c. Only inside loops
    d. In older versions

Ans: b. No

Explanation: Nested unary increment operators are not allowed. It causes a compile-time error.

17. Which operator is not allowed to be nested in Java?
    a. =
    b. ++
    c. +
    d. !=

Ans: b. ++

Explanation: Nesting increment or decrement operators like ++(++a) is not allowed.

18. Which operator reverses a Boolean value in Java?
    a. &
    b. |
    c. ~
    d. !

Ans: d. !

Explanation: Logical complement (!) flips the Boolean value. For example, !true becomes false.

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19. Which of the following is a binary operator in Java?

a. ++

b. –

c. +

d. !

Ans: c. +

Explanation: Binary operators work on two operands; + is used to add values.

20. Which operator is used for division?

a. %

b. /

c. \\

d. :

Ans: b. /

Explanation: The division operator / performs standard division. For example, 10 / 2 = 5.

21. Which operator gives the remainder in division?

a. /

b. %

c. *

d. ++

Ans: b. %

Explanation: The % operator returns the remainder of a division operation.

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22. What is the result of 9 % 4 in Java?

a. 2

b. 1

c. 3

d. 4

Ans: b. 1

Explanation: % gives the remainder of division. 9 divided by 4 leaves a remainder of 1.

23. What is the result of int m = 10; m %= 6; System.out.println(m);?

a. 4

b. 6

c. 10

d. 0

Answer: a. 4

Explanation: 10 % 6 = 4.

24. Which of the following is an arithmetic operator?

a. ++

b. ==

c. *

d. !

Ans: c. *

Explanation: Arithmetic operators perform mathematical operations. * is used for multiplication.

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25. What does the == operator check?
    a. Type checking
    b. Reference comparison
    c. Value equality
    d. Bitwise addition

Ans: c. Value equality

Explanation: == compares the actual values of operands. It returns true if values are equal.

26. Which operator means "not equal to"?
    a. <>
    b. !=
    c. !
    d. ==

Ans: b. !=

Explanation: The != operator checks for inequality. It returns true if the operands differ.

27. Which operator checks if a value is greater than another?
    a. >
    b. <
    c. ==
    d. !=

Ans: a. >

Explanation: Greater-than operator returns true if the first value is bigger than the second.

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28. What does the operator <= represent?
    a. Less than
    b. Greater than or equal to
    c. Less than or equal to
    d. Not equal

Ans: c. Less than or equal to

Explanation: It returns true if the left-hand value is smaller than or equal to the right.

29. Which logical operator returns true only if both conditions are true?
    a. ||
    b. &&
    c. !
    d. ==

Ans: b. &&

Explanation: The logical AND && returns true only when both expressions are true.

30. What does || mean in Java?
    a. Logical AND
    b. Logical OR
    c. Bitwise OR
    d. XOR

Ans: b. Logical OR

Explanation: || returns true if any one of the conditions is true.

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31. What will be the result of this?(true && true)?
    a. true
    b. false
    c. error
    d. null

Ans: b. false

Explanation: true && true is true. ! inverts it to false.

32. What does the left shift operator << do?
    a. Increases by 1
    b. Multiplies by 2^n
    c. Reduces by 2^n
    d. Divides by 10

Ans: b. Multiplies by 2^n

Explanation: Left shift moves bits to the left. It multiplies the value by 2 raised to n.

33. What does x << 2 mean in Java?
    a. Divide x by 2
    b. Shift bits of x left by 2
    c. Compare x with 2
    d. Convert x to boolean

Ans: b.Shift bits of x left by 2

Explanation: The left shift operator multiplies x by 2 raised to 2.

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34. What is the output of 10 << 2?

a. 40
b. 20
c. 10
d. 5

Ans: a. 40

Explanation: 10 × 2^2 = 40. Two-bit shift to the left is like multiplying by 4.

35. What does the right shift operator >> perform?

a. Adds zero
b. Shifts bits left
c. Divides by 2^n
d. Performs logical OR

Ans: c. Divides by 2^n

Explanation: Right shift moves bits to the right. It's equivalent to integer division by powers of 2.

36. What is the result of 20 >> 3?

a. 3
b. 2
c. 5
d. 1

Ans: b. 2

Explanation: 20 ÷ 2^3 = 20 ÷ 8 = 2.5, but result is truncated to integer 2.

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37. Which operator performs bitwise AND?
    a. &
    b. &&
    c. |
    d. ~

Ans: a. &

Explanation: Bitwise AND compares bits of two numbers. Only 1 & 1 results in 1.

38. Which operator performs bitwise OR?
    a. ||
    b. &
    c. |
    d. !

Ans: c. |

Explanation: Bitwise OR returns 1 if either bit is 1. It's different from logical OR (||).

39. What does the bitwise XOR operator ^ do?
    a. Returns true when both inputs match
    b. Reverses the bits
    c. Returns true if bits are different
    d. Checks sign

Ans: c. Returns true if bits are different

Explanation: XOR gives 1 when bits differ. For example, 1 ^ 0 = 1.

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40. Which operator complements each bit of a number?

a. ~
b. !
c. ^
d. &

Ans: a. ~

Explanation: Bitwise complement inverts each bit. It changes 0 to 1 and vice versa.

41. Which operator performs an unsigned right shift?

a. >>
b. <<
c. >>>
d. ~>>

Ans: c. >>>

Explanation: >>> shifts bits to the right, filling zeros from the left.

42. What does = mean in Java?

a. Comparison
b. Reference
c. Assignment
d. Logical check

Ans: c. Assignment

Explanation: = assigns a value to a variable. It does not compare values.

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43. What is the output of int age = 5;?
    a. Assigns 5 to age
    b. Compares age
    c. Declares but doesn't initialize
    d. Error

Ans: a. Assigns 5 to age

Explanation: This line declares and initializes the variable age with value 5.

44. Which operator is used to assign a value in Java?
    a. =
    b. =
    c. :=
    d. equals

Ans: a. =

Explanation: The assignment operator = assigns the right-hand value to the left-hand variable. It is not used for comparison.

45. What will be the result of int a = 5; a += 3;?
    a. a = 3
    b. a = 8
    c. a = 5
    d. Error

Ans: b. a = 8

Explanation: a += 3 is shorthand for a = a + 3. It updates the variable in place.

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46. What is the result of System.out.println('A' + 1);?

a. A1
b. 65
c. 66
d. Error

Answer: c. 66

Explanation: 'A' has ASCII value 65. So 65 + 1 = 66.

47. Which of the following is not an assignment operator?

a. +=
b. *=
c. ==
d. -=

Ans: c. ==

Explanation: == is a comparison operator. It does not assign values.

48. What does a *= 2; mean in Java?

a. Multiply "a" by 2 and assign
b. Assign 2 to a
c. Divide a by 2
d. Add 2 to a

Ans: a. Multiply "a" by 2 and assign

Explanation: a *= 2 is a compound operator. It multiplies and reassigns the result to a.

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49. What happens when logical operators are used with non-boolean values?
    a. Converts them to numbers
    b. Causes an error
    c. Converts to boolean based on truthiness
    d. Ignores values

Ans: b. Causes an error

Explanation: Logical operators (&&, ||) in Java only works with boolean expressions. Using integers or strings gives an error.

50. What is the priority of unary ++ compared to binary + in Java?
    a. Same priority
    b. Lower priority
    c. Higher priority
    d. Random priority

Ans: c. Higher priority

Explanation: Unary operators have higher precedence than binary operators. Thus, ++a + b will increment before addition.

51. Which operator has the lowest precedence in Java?
    a. ++
    b. +
    c. =
    d. /

Ans: c. =

Explanation: Assignment (=) has the lowest precedence. It executes after all arithmetic and logical operations.

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52. In which condition does short-circuiting happen in && operation?
    a. Both operands are false
    b. Left operand is false
    c. Right operand is false
    d. Left operand is true

Ans: b. Left operand is false

Explanation: && stops checking further if the first condition is false. This is known as short-circuiting.

53. Is it valid to use ++ on a "final" variable?
    a. Yes
    b. No
    c. Sometimes
    d. Only in loops

Ans: b. No

Explanation: Final variables cannot be modified after initialization. Incrementing them with ++ is illegal.

54. What is the result of x = 5; y = ++x;?
    a. x = 5, y = 5
    b. x = 6, y = 6
    c. x = 6, y = 5
    d. x = 5, y = 6

Answer: b. x = 6, y = 6

Explanation: ++x increases x before assigning to y.

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55. What is the result of int q = 2; System.out.println(q++ * 5);?
    a. 10
    b. 15
    c. 5
    d. 20

Answer: a. 10

Explanation: q++ uses 2 first, so 2 * 5 = 10.

56. What happens when shifting a negative number using >> in Java?
    a. It fills with 1s on left
    b. It throws error
    c. It becomes positive
    d. It fills with 0s

Ans: a. It fills with 1s on left

Explanation: Signed right shift keeps the sign bit. For negative numbers, 1s are added on the left.

57. Which operator is preferred for checking two conditions both must be true?
    a. ||
    b. &&
    c. =
    d. !

Ans: b. &&

Explanation: && returns true only when both sides are true. It is used for strict conditional checks.

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58. What is the output of System.out.println(15 << 2);?

a. 60

b. 30

c. 45

d. 50

Ans: a. 60

Explanation: 15 * 2^2 = 60. Left shift by 2 positions multiplied multiplied by 4.

59. Which operator is typically used in loop conditions?

a. =

b. ==

c. *

d. /

Ans: b. ==

Explanation: Loop conditions often compare values. == checks for equality in loop termination checks.

60. Why is the logical NOT (!) operator useful in conditionals?

a. Makes code longer

b. Reverses the condition

c. Increases variable

d. Assigns true to false

Ans: b. Reverses the condition

Explanation: ! flips the result of a condition. Useful in negating boolean expressions.

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61. What type of value is required for bitwise operators?

a. float
b. double
c. boolean
d. integer

Ans: d. integer

Explanation: Bitwise operations work at the bit level. They require integer-type operands.

62. What is the output of System.out.println(10 << 2);?

a. 12
b. 20
c. 40
d. 8

Answer: c. 40

Explanation: 10 << 2 shifts 10 left by 2 bits: 10 * 2^2 = 40.

63. What is the result of System.out.println(!(true && false));?

a. false
b. true
c. error
d. null

Answer: b. true

Explanation: true && false is false, !false becomes true.

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64. What is the result of System.out.println('C' - 'A');?

a. 3

b. 2

c. 1

d. 0

Answer: b. 2

Explanation: 'C' = 67, 'A' = 65, difference is 2.

65. What is the output of the following code?

```
int x = 20, y = 30, z = 50;
x += y;
y -= x + z;
System.out.println("x = " + x);
System.out.println("y = " + y);
```

a. x = 50, y = -70

b. x = 50, y = -80

c. x = 20, y = 30

d. Error

Answer: a. x = 50, y = -70

Explanation: x becomes 50, then y = 30 - 100 = -70.

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66. What is the output of the following code?

```
int x, y, z;
x = y = z = 2;
x += y;
y -= z;
z /= (x + y);
System.out.println(x + " " + y + " " + z);
```

a. 2 2 1
b. 4 0 0
c. 4 2 0
d. Error

Answer: b. 4 0 0

Explanation: x=4, y=0, z=2/(4+0)=0.

67. What is the result of the following code?

```
int x, y, z;
1 = x;
y = z = 2;
int a = x + y + z;
System.out.println(;
```

a. 3
b. 2
c. 3.0
d. Error

Answer: d. Error

Explanation: 1 = x is invalid syntax. Assignment to a constant is not allowed.