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1. What is the result of the expression 5 + 3 * 2 in Java?
    a. 11
    b. 16
    c. 26
    d. 23

Ans: a. 11

Explanation: Arithmetic operators follow the order of operations (PEMDAS/BODMAS). First perform the multiplication: 3 * 2 equals 6. Then, perform the addition: 5 + 6 equals 11. So the result of the expression 5 + 3 * 2 in Java is 11.

2. Which operator is used for division in Java?
    a. /
    b. %
    c. *
    d. -

Ans: a. /

Explanation: The / operator performs division between two operands. For example, a / b divides a by b.

3. What is the value of the expression 7 % 3 in Java?
    a. 1
    b. 2
    c. 3
    d. 0

Ans: a. 1

Explanation: The % operator is used for the modulus operation, which returns the remainder of a division operation

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4. Which of the following is a unary operator in Java?
    a. +
    b. -
    c. *
    d. Both a and b

Ans: d. Both a and b

Explanation: The unary operator is an operator that operates on only one operand. Both + and - are unary operators.

5. What is the result of the expression 10 / 3 in Java?
    a. 3.3333
    b. 3
    c. 7
    d. 4

Ans: b. 3

Explanation: In Java, the expression 10 / 3 results in 3 due to integer division, which truncates any fractional part of the result.

6. What is the result of the expression true && false in Java?
    a. true
    b. false
    c. 1
    d. 0

Ans: b. false

Explanation: In Java, the expression true && false evaluates to false because the logical AND (&&) operator requires both operands to be true for the result to be true.

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7. What is the value of the expression 5 + 2 == 7 && 4 > 3 in Java?
    a. true
    b. false
    c. 1
    d. 0

Ans: a. true

Explanation: The expression 5 + 2 == 7 && 4 > 3 in Java evaluates to TRUE because both conditions (5 + 2 == 7 and 4 > 3) are true.

8. Which operator is used for logical NOT in Java?
    a. !
    b. &&
    c. ||
    d. ~

Ans: a.!

Explanation: The! operator is used to negate the value of a boolean expression. For example! true evaluates to false, and ! false evaluates to true.

9. What is the result of the expression 5 | 3 in Java?
    a. 7
    b. 8
    c. 1
    d. 3

Ans: a. 7

Explanation: Convert 5 and 3 to binary:

- 5 in binary is 0101.
- 3 in binary is 0011.

Therefore 0101|0011 is 0111which is '7'

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10. What is the value of the expression 6 > 4? 10: 20 in Java?
    a. 6
    b. 4
    c. 10
    d. 20

Ans: c. 10

Explanation: It evaluates the condition 6 > 4. Since 6 > 4 is true, the expression evaluates to the value before: which is 10.

11. Which operator is used to perform bitwise XOR in Java?
    a. &
    b. |
    c. ^
    d. ~

Ans: c. ^

Explanation: The ^ operator performs a bitwise XOR operation.

12. What is the result of the expression 3 << 2 in Java?
    a. 6
    b. 9
    c. 8
    d. 12

Ans: d. 12

Explanation: For the expression 3 << 2:

- 3 in binary is 0011.
- Shift left by 2 positions: 0011 becomes 1100 in binary.

Convert 1100 from binary to decimal:

- 1100 in binary is 12 in decimal.

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13. What is the value of the expression true || false in Java?
    a. true
    b. false
    c. 1
    d. 0

Ans: a. true

Explanation: In Java, the || operator is the logical OR operator. It returns true if at least one of the operands is true, otherwise it returns false.

14. What is the result of the expression 10 > 5? 2: 1 in Java?
    a. 10
    b. 5
    c. 2
    d. 1

Ans: c. 2

Explanation: When the condition is true (10 > 5), the value before the colon (2) is returned

15. Which operator is used for string concatenation in Java?
    a. &
    b. &&
    c. ||
    d. +

Ans: d.+

Explanation: The operator used for string concatenation in Java is + (plus sign). It joins strings together to form a single concatenated string.

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16. What is the result of the expression 4 * 2 + 3 in Java?
    a. 14
    b. 20
    c. 11
    d. 10

Ans: d. 11

Explanation: The expression 4 * 2 + 3 in Java evaluates to 11 due to operator precedence (multiplication first, then addition). Thus, the correct Ans is option c: 11.

17. Which operator is used for exponentiation in Java?
    a. Math. Pow ()
    b. **
    c. ^^
    d. ^*

Ans: a. Math. Pow ()

Explanation: The correct way to perform exponentiation in Java is by using the Math. Pow () method. Java does not have an exponentiation operator like **.

18. What is the value of the expression 9 % 4 in Java?
    a. 1
    b. 2
    c. 3
    d. 0

Ans: a. 1

Explanation: The expression 9 % 4 in Java evaluates to 1. The modulus operator % returns the remainder of the division of two numbers.

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19. Which of the following is a bitwise operator in Java?
    a. &
    b. &&
    c. ||
    d. !

Ans: a. &

Explanation: The bitwise AND operator & is used for performing bitwise operations on integers in Java.

20. What is the result of the expression 8 / 4 in Java?
    a. 2
    b. 2.0
    c. 0.2
    d. 4.00

Ans: a. 2

Explanation: When you divide 8 by 4, the result is 2.

21. What is the value of the expression false || true in Java?
    a. true
    b. false
    c. 1
    d. 0

Ans: a. true

Explanation: It returns true if at least one of the operands is true.

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22. What is the value of the expression 8 < 6? 4: 2 in Java?

a. 8
b. 6
c. 4
d. 2

Ans: d. 2

Explanation: The condition 8 < 6 is false because 8 is not less than 6.
Since the condition is false, the value after the colon (2) is returned.

23. Which operator is used for bitwise NOT in Java?

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

Ans: d.~

Explanation: The bitwise NOT operator in Java is ~ (tilde). It flips each bit of its operand; for example, ~x will give you the bitwise complement of x.

24. What is the result of the expression 5 ^ 3 in Java?

a. 8
b. 6
c. 2
d. 0

Ans: b. 6

Explanation: In binary, 5 is 101 and 3 is 011. Performing XOR, the result is 110(6)

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25. What is the result of the expression 7 / 0 in Java?

a. It causes a runtime exception.

b. NaN (Not-a-Number)

c. 7

d. 0

Ans: a. It causes a runtime exception.

Explanation: In Java, dividing a number by zero (7 / 0) causes a runtime exception known as Arithmetic Exception. This is because division by zero is undefined in mathematics and programming.

26. int x = 0, y = 0, z = 0;

x = (++x + y--) * z++;

What will be the value of "x" after execution?

a. 2

b. -1

c. 0

d. 1

Ans: c. 0

Explanation: x will have the value 0. This is because ++x increments x to 1, y-- uses 0 and decrements y to -1, and z++ uses 0 and increments z to 1, resulting in 0 being assigned to x.

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27. int ++a = 100;

System.out.println(++a);

What will be the output of the above fraction of code?

a. 100
b. Displays error as ++a is not enclosed in double quotes in println statement
c. Compiler displays error as ++a is not a valid identifier
d. None of these

Ans: c. Compiler displays error as ++a is not a valid identifier

Explanation: The code int ++a = 100; will result in a compiler error because identifiers in Java cannot start with an increment (++) operator.

28. Which of the following is a relational operator in Java?

a. +
b. =
c. ==
d. &&

Ans: c. ==

Explanation: The relational operator in Java is used to compare two values. The == operator is used to check if two values are equal or not.

29. Which of the following is a logical operator in Java?

a. ++
b. /
c. &&
d. =

Ans: c. &&

Explanation: The logical AND operator && is indeed a logical operator in Java. It's used to perform logical conjunction on boolean operands, evaluating to true only if both operands are true.

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30. Which of the following operators has the highest precedence in Java?

a. +
b. /
c. ++
d. &&

Ans: c.++

Explanation: In Java, increment (++) has higher precedence than addition (+), division (/), and logical AND (&&).

31. Which of the following operators is used to perform decrement in Java?

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

Ans: a.--

Explanation: The operator -- is used for decrementing a variable by 1 in Java. It can be used as a postfix operator (i--) to decrement after using the current value, or as a prefix operator (--i) to decrement before using the value.

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32. What is the output of the following code snippet?

```
int a = 5;
int b = 2;
int c = a / b;
System.out.println(c);
```

a. 2
b. 2.5
c. 3
d. Compilation error

Ans: a. 2

Explanation: In Java, when you divide two integers (a and b in this case) using the / operator, the result is the integer quotient of the division. Any fractional part is discarded (truncated towards zero).

33. Which of the following operators is used to perform left shift in Java?

a. <<
b. >>
c. &
d. |

Ans: a. <<

Explanation: The << operator shifts the bits of a number to the left.

34. Which of the following is a conditional operator in Java?

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

Ans: d.?

Explanation: In Java, the ? : operator, also known as the ternary conditional operator, is used for conditional operations.

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35. What is the output of the following code snippet?

```
int x = 10;
int y = 20;
int z = x++ + ++y;
System.out.println(z);
```

a. 31
b. 32
c. 33
d. 34

Ans: c. 33

Explanation: The output of the code int z = x++ + ++y; System.out.println(z); will be 31. This is because x++ uses x's current value (10) and increments it after, while ++y increments y before its use in the addition.

36. What is the output of the following code snippet?

```
int a = 5;
int b = 7;
System.out.println((a > b)? "a is greater than b": "a is less than or equal to b");
```

a. a is greater than b
b. a is less than or equal to b
c. Compilation error
d. Runtime error

Ans: b. a is less than or equal to b

Explanation: The code snippet System.out.println((a > b)? "a is greater than b": "a is less than or equal to b"); will output "a is less than or equal to b".

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37. What is the right output of this program?

```
public class UnaryOperators {
   public static void main (String [] args) {
      int i = 5;
      System.out.print(i++);
      System.out.print(++i);
      System.out.print(i--);
      System.out.print(--i);
   }
}
```

a. 6765
b. 5654
c. 5775
d. 5765

Ans: c. 5775

Explanation: let's analyze the output based on the sequence of operations:

1. System.out.print(i++);
   - Prints 5.
   - i becomes 6.
2. System.out.print(++i);
   - Increments i to 7.
   - Prints 7.
3. System.out.print(i--);
   - Prints 7.
   - i becomes 6.
4. System.out.print(--i);
   - Decrements i to 5.
   - Prints 5.

Therefore, the correct output sequence is 5775.

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38. What is the right output of this program?

```
public class RelationalOperators {
   public static void main (String [] args) {
      int a = 4;
      int b = 5;
      System.out.print(a>b);
      System.out.print(",");
      System.out.print(a<b);
   }
}
```

a. true, true
b. false, true
c. 0, true
d. 0,1

Ans: b. false, true

Explanation: a > b evaluates to false because 4 is not greater than 5.

a < b evaluates to true because 4 is less than 5.

Therefore, the output of the program will be "false, true"

39. Decrement operator, −−, decreases the value of a variable by what number?

a. 1
b. 2
c. 3
d. 4

Ans: a. 1

Explanation: The decrement operator -- decreases the value of a variable by 1 in most programming languages, including Java.

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40. Which operator is used for equality comparison in Java?

a. +
b. =
c. ==
d. &&

Ans: c. ==

Explanation: == compares two values to determine if they are equal. It returns true if the values are equal, and false otherwise.

41. What is the output of the following program?

```
public class Main {
   public static void main (String [] args) {
      int x = 10;
      int y = x++;
      System.out.println(y);
   }
}
```

a. 10
b. 11
c. 9
d. Compile-time error

Ans: c. Compiler displays error as ++a is not a valid identifier

Explanation: Assigns the current value of x (which is 10) to y, and then increments x to 11 due to the post-increment (x++). System.out.println(y); Prints the value of y, which is 10.

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42. What does the '++' operator do to a variable?
    a. Decreases its value by 1
    b. Increases its value by 1
    c. Doubles its value
    d. Squares its value

Ans: b. Increases its value by 1

Explanation: The ++ operator in Java is used to increment the value of a variable by 1.

43. What is the result of the expression '! true'?
    a. true
    b. false
    c. 1
    d. 0

Ans: b. false

Explanation: The ! operator inverts the boolean value of its operand. ! true therefore results in false, which represents not true.

44. What is the precedence order of the operators: *, +, and ()?
    a. +, *, ()
    b. *, +, ()
    c. (), *, +
    d. (), +, *

Ans: c. (), *, +

Explanation: In Java, the precedence order of operators *, +, and () is: parentheses (), followed by multiplication *, and then addition +.

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45. Which operator is used to invert the value of a boolean variable?

a. ~
b. !
c. –
d. ^

Ans: b. !

Explanation: The exclamation mark (!) is the logical NOT operator in Java. It negates (inverts) the value of a boolean expression or variable.

46. What will be the output of the following code snippet?

```
int x=10;

int y=++x;

System.out.println(y);
```

a. 11
b. 10
c. 9
d. 12

Ans: a. 11

Explanation: The pre-increment operator ++x increments x to 11 before assigning it to y. Therefore, y will be 11, and System.out.println(y); prints 11

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47. What will be the output of the following code snippet?

```
int x=10;

int y=x++;

System.out.println(y);
```

a. 11
b. 10
c. 9
d. 12

Ans: b. 10

Explanation: x++ assigns the value 10 to y and then increments x to 11. So, y is 10.

48. What is left shifting equivalent to?

a. Multiplying by 4
b. Multiplying by 2
c. Adding by 2
d. Subtracting by 2

Ans: b. Multiplying by 2

Explanation: If you take a number and shift its digits to the left (like moving all the digits one place to the left), it's the same as multiplying that number by 2.

49. What is right shifting equivalent to?

a. Dividing by 2
b. Multiplying by 2
c. Adding by 2
d. Subtracting by 2

Ans: Dividing by 2

Explanation: Right shifting a binary number is equivalent to dividing by 2.