Class 9
Computer Applications
Chapter: 5
Operators In Java
(Solutions are below the questions)

Unsolved Questions

A. Tick (✓) the correct answer

1. What values will be stored in x and y respectively after executing the following?

```
int x = -10;
y = --x;
```

a. x = -11, y = -11
b. x = -10, y = -10
c. x = 11, y = 11
d. x = -11, y = 11

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2. If `m = 50` and `n = 5` then `n % 2 =?`
   a. 5
   b. 10
   c. 0
   d. None of these

---

3. "Change after action" is the example of
   a. Prefix operator
   b. Postfix operator
   c. Binary operator
   d. None of these

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4. Operators that contain one operand or expression:
   a. Unary operator
   b. Ternary operator
   c. Binary operator
   d. None of these

5. Which of the following operators is used to initialise all non-primitive data types?
   a. .(dot) operator
   b. Ternary operator
   c. New operator
   d. Relational

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6. What is the result of `a += 9;` statement?
   a. ++a
   b. a = a + 9
   c. a + 9
   d. None of these

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7. If `int a = 5, b = 4, c = 0;` what value is stored in `c`, when `c = a % ++b;`?
   a. 5.0
   b. 5
   c. 0
   d. None of these

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8. What will be the output of `++a+ ++a;` when `int a = -1`?
   a. -1
   b. 0
   c. 1
   d. None of these

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9. What is the correct Java expression for the statement $p = a^2 + bc$?
   a. p = a*a + *b*c;*
   b. p = axa + bxc;
   c. p = a.a + b.c;
   d. None of these

---

10. The operators that deal with two operands are known as:
    a. Unary
    b. Binary
    c. Ternary
    d. None of these

B. Fill in the blanks

1. Arrange these operators (<, ++, +, *) in order of higher precedence to lower precedence: _____
2. Write the Java expression of a^2+b^2+2ab: _____
3. Write the output of the expression `a + =a++ + a % a`, where a = 5: _____
4. The output of Logical Operator is in _____form.
5. Counters increase by _____ and in accumulator, the increment value is _____for each recurrence of the loop.

C. Short Answer Questions

1. What is the output of the following expressions if executed sequentially, if m = 15, n = 5:

- `r = m++ / ++n`
- `r = ++m + ++n - n++`

2. What are the Arithmetic operators?

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3. Write the Java Expression of the following mathematical expressions:
   a. A = (B + C)/2 * h
   b. V = π * r^2 * h

---

4. Give the output of the following expression

- `a = ++a + a - ++a - a;` when a = 2:
- `i *= j++ % j - k * 10;`
  when i = 2, j = 4, k = 3.

---

5. Name the operators listed below:
   (i) <
   (ii) `&&`
   (iii) `++`
   `(iv) ?:`

---

6. Write the output of the following code:

```
char ch = 'F';
int m = ch;
m = m + 5;
System.out.println(m + "" + ch);
```

---

7. What is meant by precedence of operators?

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8. Differentiate between the following:
   a. Arithmetical operator and Logical operator
   b. Logical AND and Logical OR

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9. Define Postfix Increment Operator.

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10. What will be the output of the following code?

```
int m = 2, n = 15;
for(int i = 1; i < 5; i++) {
    m++;
    n--;
}
System.out.println("m=" + m);
System.out.println("n=" + n);
```

✦✦✦ End of Worksheet ✦✦✦

Solutions – Operators (Class 9)

A. Tick (✓) the correct answer

1. int x = -10;
y = --x;
int x = -10; → so x = -10.

--x → pre-decrement, so x becomes -11 first, then the value -11 is assigned to y.

✓ Final values: x = -11, y = -11

Correct answer: a. x = -11, y = -11

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2. If m = 50 and n = 5 → `n % 2 = 5 % 2 = 1`.
   But options are (5, 10, 0, None). Correct = **None of these** ✓

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3. `"Change after action"` → **Postfix operator** ✓

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4. One operand only → **Unary operator** ✓

5. To initialize objects (non-primitive) → **new operator** ✓

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6. `a += 9;` means `a = a + 9.` ✓

7.

```
int a = 5, b = 4, c = 0;
c = a % ++b;
```

Here `++b = 5`, so `c = 5 % 5 = 0`.
Answer: **0** ✓

8.

```
int a = -1;
++a + ++a;
```

Step 1: `++a` → `a = 0`, gives 0.
Step 2: `++a` → `a = 1`, gives 1.
So total = 0 + 1 = **1** ✓

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9. Correct Java expression for p=a2+bcp = a^2 + bcp=a2+bc:
   p = a*a* + *bc*; ✓

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10. Two operands → **Binary operator** ✓

B. Fill in the blanks

1. Operator precedence: `++ , * , + , <`
2. Java expression: `a*a + b*b + 2*a*b`
3. Expression: `a += a++ + a % a` with a=5 → `a = 5 + (5 + 0)` → 10.
4. Logical operator output is in **boolean** form.
5. Counters increase by **1**, and in accumulator increment value is **variable (as per recurrence)**.

C. Short Answer Questions

1. If m = 15, n = 5:

- `r = m++ / ++n;`
  `m++ = 15`, `++n = 6` → r = 15 / 6 = 2. (Then m=16, n=6).
- `r = ++m + ++n - n++;`
  m=17, n=7 → `r = 17 + 7 - 7 = 17`.
  (After, n=8).

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2. **Arithmetic operators**: `+ , - , * , / , %`

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3. Java expressions:
   a. `A = (B + C)/2 * h;`
   b. `V = 3.14 * r*r * h;`

---

4. (i) If a = 2:

```
a = ++a + a - ++a - a;
= (3 + 3 - 4 - 4) = -2
```

(ii) `i *= j++ % j - k * 10;` when i=2, j=4, k=3

- First `j++ % j = 4 % 5 = 4`
- So → `2 * (4 - 30)` = 2 * -26 = -52

5.

(i) `<` → Relational operator
(ii) `&&` → Logical AND
(iii) `++` → Increment (Unary) operator
(iv) `?:` → Ternary operator

6.

```
char ch = 'F';    // ASCII = 70
int m = ch;       // m = 70
m = m + 5;        // 75
System.out.println(m + "" + ch);
```

Output: **75F**

7. **Precedence of operators**: The priority/order in which operators are evaluated in an expression.

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8. Differences:
   a. **Arithmetic**: Perform math (`+, -, *, /, %`).
   Logical: Deal with Boolean (`&&, ||, !`).

b. **Logical AND (&&)**: True only if both conditions true.
Logical OR (||): True if at least one condition true.

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9. **Postfix Increment Operator**: Variable is incremented **after** its current value is used. Example:

```
int a = 5;
System.out.println(a++); // prints 5, then a becomes 6
```

10.

```
int m = 2, n = 15;
for(int i = 1; i < 5; i++) {
    m++;   // runs 4 times → m = 6
    n--;   // runs 4 times → n = 11
}
System.out.println("m=" + m); // m=6
System.out.println("n=" + n); // n=11
```