

Chapter 3

Using Operators and Decision Constructs

THE OCA EXAM TOPICS COVERED IN THIS PRACTICE TEST INCLUDE THE FOLLOWING:

✓Using Operators and Decision Constructs

- Use Java operators; use parentheses to override operator precedence
- Test equality between Strings and other objects using == and equals()
- Create if and if/else and ternary constructs
- Use a switch statement

1. Which of the following variable types is not permitted in a `switch` statement?

- A. `String`
- B. `double`
- C. `int`
- D. `char`

2. What is the value of `tip` after executing the following code snippet?

```
int meal = 5;
int tip = 2;
int total = meal + (meal > 6 ? ++tip : tip);
```

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- A. 1
- B. 2
- C. 3
- D. 6

3. What is the output of the following application?

```
package registration;
public class NameCheck {
    public static void main(String... data) {
        String john = "john";
        String jon = new String(john);
        System.out.print((john==jon)+" "+(john.equals(jon)));
    }
}
```

- A. true true
- B. true false
- C. false true
- D. false false

4. What is the output of the following application?

```
package planning;
public class ThePlan {
    public static void main(String[] input) {
        int plan = 1;
        plan = plan++ + --plan;
        if(plan==1) {
            System.out.print("Plan A");
        } else { if(plan==2) System.out.print("Plan B");
        } else System.out.print("Plan C");
    }
}
```

- A. Plan A

B. Plan B

C. Plan C

D. None of the above

5. Which of the following statements about a `default` branch in a `switch` statement is correct?

A. All `switch` statements must include a `default` statement.

B. The `default` statement is required to be placed after all `case` statements.

C. Unlike a `case` statement, the `default` statement does not take a value.

D. A `default` statement can only be used when at least one `case` statement is present.

6. What is the value of `thatNumber` after the execution of the following code snippet?

```
long thatNumber = 5 >= 5 ? 1+2 : 1*1;
if(++thatNumber < 4)
    thatNumber += 1;
```

A. 3

B. 4

C. 5

D. The answer cannot be determined until runtime.

7. Which statement immediately exits a `switch` statement, skipping all remaining `case` or `default` branches?

A. `exit`

B. `break`

C. `goto`

D. `continue`

8. Which statement about ternary expressions is true?

A. In some cases, both expressions to the right of the conditional operator in a ternary expression will be evaluated at runtime.

B. Ternary expressions require parentheses for proper evaluation.

C. The ternary expressions are a convenient replacement for an if-then-else statement.

D. Ternary expressions support `int` and `boolean` expressions for the left-most operand.

9. What is the output of the following application?

```
package voting;
```

```

1: public class Election {
2:     public void calculateResult(Integer candidateA, Integer candidateB) {
3:         boolean process = candidateA == null || candidateA.intValue() < 10;
4:         boolean value = candidateA && candidateB;
5:         System.out.print(process || value);
6:     }
7:     public static void main(String[] unused) {
8:         new Election().calculateResult(null, 203);
9:     }
10: }

```

A. true

B. false

C. The code does not compile.

D. The code compiles but throws a `NullPointerException` on line 3 at runtime.

10. What is the output of the following application?

```

package dinosaur;
public class Park {
    public final static void main(String... arguments) {
        int pterodactyl = 6;
        long triceratops = 3;
        if(pterodactyl % 3 >= 1)
            triceratops++;
            triceratops--;
        System.out.print(triceratops);
    }
}

```

A. 2

B. 3

C. 4

D. The code does not compile.

11. Which statement about if-then statements is true?

A. An if-then statement is required to have an `else` statement.

B. If the `boolean` test of an if-then statement evaluates to `false`, then the target clause of the if-then statement will still be evaluated.

C. An if-then statement is required to cast an object.

D. An if-then statement can execute a single statement or a block `{}`.

12. What is the output of the following application?

```

package restaurant;
public class Pieces {
    public static void main(String[] info) {
        int flair = 15;
    }
}

```

```

    if(flair >= 15 && flair < 37) {
        System.out.print("Not enough");
    } if(flair==37) {
        System.out.print("Just right");
    } else {
        System.out.print("Too many");
    }
}
}

```

- A. Not enough
- B. Just right
- C. Too many
- D. None of the above

3. Which statement about `case` statements of a `switch` statement is not true?

- A. A `case` value can be `final`.
- B. A `case` statement must be terminated with a `break` statement.
- C. A `case` value can be a literal expression.
- D. A `case` value must match the data type of the `switch` variable, or be able to be promoted to that type.

4. Given the following truth table, which operator for the `boolean` expressions `x` and `y` corresponds to this relationship?

	x = true	x = false
y = true	true	false
y = false	false	false

- A. `--`
- B. `++`
- C. `||`
- D. `&&`

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

```

int hops = 0;
int jumps = 0;
jumps = hops++;
if(jumps)
    System.out.print("Jump!");
else
    System.out.print("Hop!");

```

- A. Jump!
- B. Hop!

C. The code does not compile.

D. The code compiles but throws an exception at runtime.

16. Fill in the blanks: The _____ operator increases the value of a variable by 1 and returns the new value, while the _____ operator decreases the value of a variable by 1 and returns the original value.

A. pre-increment [++v], pre-decrement [--v]

B. pre-increment [++v], post-decrement [v--]

C. post-increment [v++], pre-decrement [--v]

D. post-increment [v++], post-decrement [v--]

17. What is the output of the following application?

```
package jungle;
public class TheBigRace {
    public static void main(String[] in) {
        int tiger = 2;
        short lion = 3;
        long winner = lion+2*(tiger + lion);
        System.out.print(winner);
    }
}
```

A. 11

B. 13

C. 25

D. None of the above

18. Given the following code snippet, assuming `dayOfWeek` is an `int`, what variable type of `saturday` is not permitted?

```
final _____ saturday = 6;
switch(dayOfWeek) {
    default:
        System.out.print("Another Weekday");
        break;
    case saturday:
        System.out.print("Weekend!");
}
```

A. byte

B. long

C. int

D. None of the above

19. Given the following code snippet, what is the value of `dinner` after it is executed?

```
int time = 11;
int day = 4;
String dinner = time > 10 ? day ? "Takeout" : "Salad" : "Leftovers";
```

- A. Takeout
- B. Salad
- C. The code does not compile but would compile if parentheses were added.
- D. None of the above

20. What is the output of the following application?

```
package recreation;
public class Dancing {
    public static void main(String[] vars) {
        int leaders = 10 * (2 + (1 + 2 / 5));
        int followers = leaders * 2;
        System.out.print(leaders + followers < 10 ? "Too few" : "Too many");
    }
}
```

- A. Too few
- B. Too many
- C. The code does not compile.
- D. The code compiles but throws a division by zero error at runtime.

21. What is the output of the following application?

```
package schedule;
public class PrintWeek {
    public static final void main(String[] days) {
        System.out.print(5 + 6 + "7" + 8 + 9);
    }
}
```

- A. 56789
- B. 11789
- C. 11717
- D. The code does not compile.

22. Fill in the blanks: The _____ operator is used to find the difference between two numbers, while the _____ operator is used to find the remainder when one number is divided by another.

- A. /, %
- B. -, %
- C. %, <

D. -, ||

3. What is the output of the following application?

```
package transporter;
public class Rematerialize {
    public static void main(String[] input) {
        int dog = 11;
        int cat = 3;
        int partA = dog / cat;
        int partB = dog % cat;
        int newDog = partB + partA * cat;
        System.out.print(newDog);
    }
}
```

A. 9

B. 11

C. 15

D. The code does not compile.

4. What is the output of the following application?

```
package dessert;
public class IceCream {
    public final static void main(String... args) {
        int flavors = 30;
        int eaten = 0;
        switch(flavors) {
            case 30: eaten++;
            case 40: eaten+=2;
            default: eaten--;
        }
        System.out.print(eaten);
    }
}
```

A. 1

B. 2

C. 3

D. The code does not compile.

5. What is the output of the following application?

```
package mode;
public class Transportation {
    public static String travel(int distance) {
        return distance<1000 ? "train" : 10;
    }
    public static void main(String[] answer) {
        System.out.print(travel(500));
    }
}
```


}

A. `train`

B. `10`

C. The code does not compile.

D. The code compiles but throws an exception at runtime.

26. Fill in the blanks: Given two non-null `String` objects with reference names `apples`_____ and `oranges`, if `apples oranges` evaluates to `true`, then `apples`_____ `oranges` must also evaluate to `true`.

A. `==, equals()`

B. `!=, equals()`

C. `equals(), ==`

D. `equals(), !=`

27. For a given non-null `String myTestVariable`, what is the resulting value of executing the statement `myTestVariable.equals(null)`?

A. `true`

B. `false`

C. The statement does not compile.

D. The statement compiles but will produce an exception when used at runtime.

28. How many `1`s are outputted when the following application is compiled and run?

```
package city;
public class Road {
    public static void main(String... in) {
        int intersections = 100;
        int streets = 200;
        if (intersections < 150) {
            System.out.print("1");
        } else if (streets && intersections > 1000) {
            System.out.print("2");
        } if (streets < 500)
            System.out.print("1");
        else
            System.out.print("2");
    }
}
```

A. None

B. One

C. Two

D. The code does not compile.

9. Which statement about the logical operators `&` and `&&` is true?

- A. The `&` and `&&` operators are interchangeable, always producing the same results at runtime.
- B. The `&` operator always evaluates both operands, while the `&&` operator may only evaluate the left operand.
- C. Both expressions evaluate to `true` if either operand is `true`.
- D. The `&` operator always evaluates both operands, while the `&&` operator may only evaluate the right operand.

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

```
int x = 10, y = 5;
boolean w = true, z = false;
x = w ? y++ : y--;
w = !z;
System.out.print((x+y)+" "+(w ? 5 : 10));
```

- A. The code does not compile.
- B. 10 10
- C. 11 5
- D. 12 5

11. What is the output of the following application?

```
package bob;
public class AreYouBob {
    public static void main(String[] unused) {
        String bob = new String("bob");
        String notBob = bob;
        System.out.print((bob==notBob)+" "+(bob.equals(notBob)));
    }
}
```

- A. true true
- B. true false
- C. false true
- D. false false

12. What is the value of `12 + 6 * 3 % (1 + 1)` in Java?

- A. 0
- B. 12
- C. 14
- D. None of the above

3. Given the following truth table, the `boolean` variables `p` and `q`, and the expression `p ^ q`, what are the missing values in the truth table, starting with the first column?

	<code>p = true</code>	<code>p = false</code>
<code>q = true</code>	false	true
<code>q = false</code>		

- A. `false` and `true`
- B. `false` and `false`
- C. `true` and `true`
- D. `true` and `false`
4. Which of the following is not a possible result of executing the following application?

```
public class ConditionallyLogical {
    public static void main(String... data) {
        if(data.length>=1
            && (data[0].equals("sound") || data[0].equals ("logic"))
            && data.length<2) {
            System.out.print(data[0]);
        }
    }
}
```

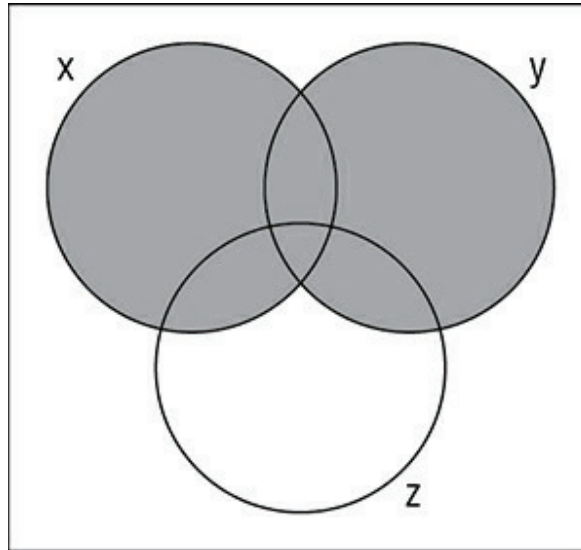
- A. Nothing is printed.
- B. `sound` is printed.
- C. The application throws an exception at runtime.
- D. `logic` is printed.
5. Fill in the blanks: The operators `+`, _____, _____, _____, and `++` are listed in the same or increasing level of operator precedence.

- A. `*`, `--`, `/`
- B. `%`, `-`, `*`
- C. `/`, `*`, `%`
- D. `*`, `-`, `/`

6. What statement about the `^` operator is correct?

- A. If one of the operands of `^` is `true`, then the result is always `true`.
- B. There is a conditional form of the operator, denoted as `^^`.
- C. If both operands of `^` are `true`, the result is `true`.
- D. The `^` operator can only be applied to `boolean` values.

37. Given the following Venn diagram and the variables, x , y , and z , which Java expression most closely represents the filled-in region of the diagram?



- A. $x \mid\mid z$
- B. $y \mid\mid (y \ \&\& \ z)$
- C. $x \mid\mid y$
- D. $y \ \&\& \ x$

38. What variable type of `red` allows the following application to compile?

```
package tornado;
public class Kansas {
    public static void main(String[] args) {
        int colorOfRainbow = 10;
        _____ red = 5;
        switch(colorOfRainbow) {
            default:
                System.out.print("Home");
                break;
            case red:
                System.out.print("Away");
        }
    }
}
```

- A. `long`
- B. `double`
- C. `int`
- D. None of the above

39. Which two operators would be used to test if a number is equal to or greater than 5.21 but strictly less than 8.1?

- A. `>` and `<=`

B. `>= and >`

C. `< and >=`

D. `< and >`

10. What is the output of the following application?

```
package transporter;
public class TurtleVsHare {
    public static void main(String[] arguments) {
        int turtle = 10 * (2 + (3 + 2) / 5);
        int hare = turtle < 5 ? 10 : 25;
        System.out.print(turtle < hare ? "Hare wins!" : "Turtle wins!");
    }
}
```

A. Hare wins!

B. Turtle wins!

C. The code does not compile.

D. The code compiles but throws a division by zero error at runtime.

11. What is the output of the following application?

```
public class CountEntries {
    public static int getResult(int threshold) {
        return threshold > 5 ? 1 : 0;
    }
    public static final void main(String[] days) {
        System.out.print(getResult(5)+getResult(1)
            +getResult(0)+getResult(2)+"");
    }
}
```

A. 0

B. 1

C. 0000

D. 1000

12. What is the output of the following application?

```
package yoyo;
public class TestGame {
    public String runTest(boolean spinner, boolean roller) {
        if(spinner == roller) return "up";
        else return roller ? "down" : "middle";
    }
    public static final void main(String pieces[]) {
        final TestGame tester = new TestGame();
        System.out.println(tester.runTest(false,true));
    }
}
```

- A. up
- B. middle
- C. down

D. The code does not compile.

13. Fill in the blanks: The _____ operator is `true` if either of the operands are `true`, while the _____ operator flips a `boolean` value.

- A. `+`, `-`
- B. `&&`, `!`
- C. `|`, `-`
- D. `||`, `!`

14. Given the following code snippet, what is the value of `movieRating` after it is executed?

```
int characters = 5;
int story = 3;
double movieRating = characters <= 4 ? 3 : story > 1 ? 2 : 1;
```

- A. 2.0
- B. 3.0
- C. The code does not compile but would compile if parentheses were added.
- D. None of the above

15. Fill in the blanks: A `switch` statement can have _____ `case` statements and _____ `default` statements.

- A. at most one, at least one
- B. any number of, at most one
- C. at least one, any number of
- D. at least one, at most one

16. Which of the following is not a possible result of executing the following application?

```
public class OutsideLogic {
    public static void main(String... weather) {
        System.out.print(weather[0] != null
            && weather[0].equals("sunny")
            && !false
            ? "Go Outside" : "Stay Inside");
    }
}
```

- A. Nothing is printed.

- B. The application throws an exception at runtime.
- C. Go Outside is printed.
- D. Stay Inside is printed.

17. What is the value of $(5 + (!2 + 8) * 3 - 3 \% 2) / 2$ in Java?

- A. 2
- B. 11
- C. 16
- D. None of the above

18. Given the following truth table, the `boolean` variables `w` and `z`, and the expression `w || z`, what are the missing values in the truth table, starting with the first row?

	<code>w = true</code>	<code>w = false</code>
<code>z = true</code>	true	
<code>z = false</code>		false

- A. false and false
- B. true and false
- C. true and true
- D. false and true

19. Fill in the blanks: The operators `-`, _____, _____, _____, and `%` are listed in the same or increasing level of operator precedence.

- A. `+`, `/`, `*`
- B. `--`, `-`, `*`
- C. `++`, `/`, `*`
- D. `*`, `++`, `%`

20. What is the output of the following application?

```
public class Baby {
    public static String play(int toy, int age) {
        final String game;
        if(toy<2)
            game = age > 1 ? 1 : 10; // p1
        else
            game = age > 3 ? "Ball" : "Swim"; // p2
        return game;
    }
    public static void main(String[] variables) {
        System.out.print(play(5,2));
    }
}
```

}

A. Ball

B. Swim

C. The code does not compile due to p1.

D. The code does not compile due to p2.