

# Computer Applications Test

November 31, 2024

## Instructions

- Answer all questions.
- Write your answers clearly and neatly.
- This test is worth 30 marks.

## Section A: Multiple Choice Questions (10 Marks)

Answer the following questions. Each question is worth 1 mark.

1. Which of the following is the correct syntax for a for loop in Java?

- a) `for (i = 0; i < n; i++)`
- b) `for (i < n; i++)`
- c) `for (int i = 0; i < n; i++)`
- d) `for (int i; i < n; i++)`

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

```
int x = 5, y = 10;  
int z = x > y ? x : y;  
System.out.println(z);
```

- a) 5
- b) 10
- c) 0
- d) Error

3. In Java, what does the following loop do?

```
for (int i = 0; i < 10; i++) {  
    System.out.println(i);  
}
```

- a) Prints numbers 1 to 10
- b) Prints numbers 0 to 9
- c) Prints numbers 1 to 9

d) Prints numbers 0 to 10

4. What is the output of the following code?

```
int num = 4;
if (num % 2 == 0)
    if (num > 0)
        System.out.println("Even");
    else
        System.out.println("Negative");
else
    System.out.println("Odd");
```

- a) Even
- b) Odd
- c) Error
- d) Negative

5. Which of the following statements is true about the if-else statement in Java?

- a) The else block is mandatory.
- b) The if block is mandatory.
- c) Both if and else blocks are mandatory.
- d) Neither if nor else blocks are mandatory.

6. Which of the following data types has the largest memory size in Java?

- a) int
- b) long
- c) float
- d) double

7. What will the following code snippet print?

```
int a = 5, b = 3;
System.out.println(a / b);
```

- a) 1
- b) 1.666
- c) 2
- d) Error

8. What does the following code output?

```
int[] arr = {1, 2, 3, 4};  
System.out.println(arr[4]);
```

- a) 4
- b) 0
- c) IndexOutOfBoundsException
- d) Error

9. Which of the following is not a valid access modifier in Java?

- a) public
- b) static
- c) private
- d) protected

10. What is the value of 'x' after the following code executes?

```
int x = 5;  
x += x++ + ++x;
```

- a) 17
- b) 18
- c) 19
- d) Undefined

## Section B: Programming Questions (10 Marks)

Write the Java programs for the following questions. Each question is worth 2 marks.

1. Write a Java program to check if a number is a prime number.
2. Write a Java program to check if a number is a composite number.
3. Write a Java program to check if a number is a perfect number.
4. Write a Java program to check if a number is a deficient number.
5. Write a Java program to check if a number is a pronic number.

## Section C: Sorting and Searching (10 Marks)

Answer the following questions. Each question is worth 5 marks.

1. Explain the steps of the Binary Search algorithm and write a Java program to implement it.
2. Explain the steps of the Bubble Sort algorithm and write a Java program to implement it.