

# CSC 1103 - Midterm Exam 2

## Version A

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### Student Information

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### Instructions:

- Answer all questions in the space provided.
- Total points: 100.
- Topics: Loops, Strings, Math Methods, Static/Recursive Methods.
- **This exam contains 8 pages.**

## Part I: Multiple Choice Questions (60 Points)

**Instructions:** Circle the letter of the single best answer. (3 Points Each)

1. Which loop construct is guaranteed to execute its body at least once?
  - (A) `for` loop
  - (B) `while` loop
  - (C) `do-while` loop
  - (D) None of the above
  
2. Which of the following is true about **method overloading**?
  - (A) Methods must have different names
  - (B) Methods must have the same name but different parameter lists
  - (C) Methods must have the same return type
  - (D) It causes a runtime error
  
3. What is the output of: `System.out.println("Result: " + 3 + 7);`?
  - (A) `Result: 10`
  - (B) `Result: 37`
  - (C) `Result: 21`
  - (D) Error
  
4. Given `String s = "Welcome";`, what is the result of `s.charAt(3)`?
  - (A) `'l'`
  - (B) `'c'`
  - (C) `'o'`
  - (D) `'m'`
  
5. Which signature is valid for a static method returning a **boolean**?
  - (A) `public static boolean check(int a)`
  - (B) `public void check(int a)`
  - (C) `static public int check()`
  - (D) `public boolean static check()`

6. What is the output of `Math.max(10, Math.min(15, 5))`?
- (A) 5
  - (B) 10
  - (C) 15
  - (D) 0
7. Which `Scanner` method reads a single word (token) as a `String`?
- (A) `nextString()`
  - (B) `nextLine()`
  - (C) `next()`
  - (D) `readWord()`
8. What happens if you call `s.charAt(10)` on a string of length 5?
- (A) Returns space character
  - (B) Returns last character
  - (C) Returns `null`
  - (D) Throws `StringIndexOutOfBoundsException`
9. Which code snippet correctly converts "123" to an `int`?
- (A) `int i = (int)"123";`
  - (B) `Integer.parseInt("123");`
  - (C) `"123".toInt();`
  - (D) `Cast.toInt("123");`
10. What is the output of the following recursive method if called as `fun(3)`?

```
public static void fun(int n) {  
    if (n > 0) {  
        System.out.print(n + " ");  
        fun(n - 1);  
    }  
}
```

- (A) 3 2 1
- (B) 1 2 3
- (C) 3 2 1 0
- (D) 0 1 2 3

11. What is the return value of `Math.pow(2, 3)`?
- (A) 6.0
  - (B) 8.0
  - (C) 9.0
  - (D) 5.0
12. In a `for` loop, when is the update statement (e.g., `i++`) executed?
- (A) Before condition check
  - (B) After loop body executes
  - (C) Only if condition is false
  - (D) Before loop body executes
13. What happens during `**ambiguous invocation**` of a method?
- (A) The compiler cannot determine the most specific match
  - (B) The method calls itself infinitely
  - (C) The first declared method is used
  - (D) The arguments are automatically cast to `int`
14. What is the correct index of the last character in String `s`?
- (A) `s.length()`
  - (B) `s.length() - 1`
  - (C) `s.length() + 1`
  - (D) `s.size() - 1`
15. Every recursive method must have a \_\_\_\_\_ to stop recursion.
- (A) Loop
  - (B) Base case
  - (C) `static` keyword
  - (D) Parameter

16. Which method converts a string to all lowercase letters?
- (A) `toLowerCase()`
  - (B) `toLower()`
  - (C) `lowerCase()`
  - (D) `changeCase(false)`
17. What does `Math.round(2.6)` return?
- (A) 2
  - (B) 3
  - (C) 2.6
  - (D) 2.0
18. Which keyword skips the rest of the current loop iteration?
- (A) `break`
  - (B) `return`
  - (C) `exit`
  - (D) `continue`
19. What is the value of `"Hello".length()`?
- (A) 4
  - (B) 5
  - (C) 6
  - (D) `"Hello"`
20. Which method finds the index of the first occurrence of a character?
- (A) `find()`
  - (B) `search()`
  - (C) `indexOf()`
  - (D) `charAt()`

## Part II: Short Answer Questions (40 Points)

**Instructions:** Answer in the space provided. (4 Points Each)

1. **(Fill in Blank)** The \_\_\_\_\_ class contains methods like `min`, `max`, and `abs`.
2. **(Code)** Write a statement to find the length of the string variable `text` and store it in an `int` variable named `size`.
3. **(Code)** Write a `for` loop that prints the sequence: 0, 5, 10, 15, 20.

4. **(Concept)** What is the range of values returned by the `Math.random()` method? (Write the answer in interval notation, e.g.,  $[a, b)$ ).
  
  
  
  
  
  
  
  
  
  
5. **(Fill in Blank)** A method that calls itself is known as a \_\_\_\_\_ method.
  
  
  
  
  
  
  
  
  
  
6. **(Code)** Write a static method named `calculateArea` that takes two `double` parameters (`L`, `W`) and returns the area (`L * W`).

7. **(Code)** Write a code snippet using a loop to print all numbers from **1 to 1000** (inclusive) that are divisible by **both 3 and 7**.

8. **(Completion)** Fill in the blanks to count down from 10 to 1:

```
int i = 10;
while (_____) {
    System.out.println(i);
    _____;
}
```

9. **(Tracing)** What is the result of `System.out.println(4 + 5 + " Java");`?

10. **(Code)** Write a statement to parse the string "3.14" into a **double** variable named **val**.