Section 2 Exam 1: Theory Component

- This exam is closed-book, closed-note, closed electronics, closed NetBeans, and no USBs.
- Calculators, cell phones, and devices that allow communication of any kind are not permitted for use in any way during examination.
- The sooner you complete this exam, the more time you'll have for your programming part of this exam.
- Please write your answers in the attached answer sheet file and submit (upload) that file .
- Cross out whatever you don't want to be marked.
- If more than one answer is provided for a question requiring a written answer, only the first answer will be graded.
- Your grade for this theory part of the exam will be based on your first upload of your answer sheet file.

True or False Questions ($10 \times 2 = 20$ points)

Indicate whether each of the statements below is True or False. Write True False on the answer sheet.

1. No matter what data type an array stores, you can initialize the array either by using the keyword `new` , or by using the braces "{}" filled with comma separated initial values.

2. If you want to check the value of an int element in an N-dimensional int array, you needs N–1 of pairs of square brackets[] to indicate the index.

3. Assume you have an `int[] nums`; then, the call `Arrays.sort(nums)` will directly sort the array, rearranging its elements when necessary.

4. Two arrays are said to be parallel if they have no elements in common.

5. `boolean equals(Object obj)` is an overloaded method.

6. Consider the statement `String[] strs = {"hello", "Hi"};` After executing this statement, only 1 reference is allocated in the memory.

7. An `int` array uses 1 piece of memory, the same as an `int` variable.

8. We can use enhanced for loop to print an array in the reversed order.

9. `Object` is the ultimate parent class of every class in Java.

10. A class must have a getter and a setter method for every data member.

Multiple Choice Questions ($10 \times 2 = 10$ points)

In the space provided on the answer sheet, write the letter of only one answer choice that best completes each statement or best answers each question.

11. The default value of an element in an `int[]` array is

A. 0

B. '0'

C. 0.0

D. null

12. Assume you want to check the number of vowels in `String[] strs`, and you want to use enhanced for loop as much as possible. To do all that you need use

A. only 1 enhanced for loop

B. 1 enhanced for loop and a regular for loop

C. 2 enhanced for loop

D. 2 enhanced for loop and a regular for loop

13. In which situation you CANNOT use enhanced for loop?

A. Find the min or the max of a double array

B. Set the hour of each `Clock` object in a `Clock` array (`Clock[]`)

C. Multiply the corresponding elements of two `int` arrays `num1` and `num2` (same length) to create a third array `nums3`.

D. Print each element in an `int` array if the value is bigger than 5

14. Given the declaration `double[][][][] num4Array`, what is the data type of `num4Array[i][j][k]`?

A. double

B. double[ ]

C. double[ ][ ]

D. double[ ][ ][ ]

15. Given `String[][][] str4Array`, if you want to count the number of upper and lower case letters, you need _____ for loops

A. 2

B. 3

C. 4

D. 5

16. An array _____

A. may have a negative size

B. may have elements with different data types

C. may have elements with the same value

D. may have unlimited storage space

17. You can initialize an `int` array `a` using the syntax _____

A. `int[] a = {1,2,3};`

B. `int[3] a = {1,2,3};`

C. `int[] a = [1,2,3];`

D. `int[3] a = [1,2,3];`

18. The `Arrays.toString()` method can be used on _____

A. Only 1d array

B. Only 2 and more dimensional arrays

C. Both a and b

D. None of a and b

19. What will the following code segment print?

```
char character = 'a';
System.out.print(character - 'a' + 'A' + 1);
```

A. 'A'

B. 'B'

C. The ASCII code of 'B'

D. Error

20. What will the following code segment print?

```
int a = (char) (12.5 + 8 / 3) % (int) (7 / 4 + (double) (8 / 3)
    );
switch (a)
{
  case  0:
       System.out.print(0);
  case  1:
       System.out.print(1);
  case  2:
       System.out.print(2);
}
```

A. 0

B. 01

C. 012

D. 2

Short Answer Question ($4 \times 5 = 20$ points)

Answer any 4 of the 6 questions 21 to 26 below.

21. Given `int[] nums`,

1. write a regular for loop to go through the array and print each element on a new line, and
2. write an enhanced for loop to do the same thing

22. Name five methods from the Java Arrays Class API, giving a simple example for each.

23. Assume that

1. you have a class `Product`, which has a copy constructor, and
2. you have another class `Shop`, that contains two data members:

   `String name`

   `Product[] products`

Write a copy constructor for the `Shop` class.

24. Write enhanced for loop(s) to count the number of even numbers in `int[][] nums`

For questions 25 and 26, determine whether the given Java code segment will compile. If your answer is yes, what will be the output? If you think the code will not compile, describe the reason for the error.

25.

```
Boolean [] flags = {true, true, false, false};
for (int i = 0; i < flags.length; i++) {
    int j = (i == flags.length - 1) ? 0 : i + 1;
    if ((flagss[i] && !flags[j] ) || (!flags[i] && flags[j]))
         System.out.print('T');
    else
         System.out.print('F');
```

26.

```
int[] nums = {-1, 0, 1};
for (int num : nums)
        System.out.print(num + 'H');
```