There are 18 questions on this test. The value of each question is:

- 1-15 multiple choice (3 pts)
- 17 coding problem (15 pts)
- 16, 18 coding problems (20 pts)

You may get partial credit for questions 16-18. If you finish early, use the extra time to double check your work. You may not use notes, books or electronic devices of any sort. All cell phones and other mobile devices must be turned off during the exam.

Good luck!

Name ___________________________ Student ID _______________________
Section _________

Answers for Questions 1 to 15

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EXAM SCORES

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MULTIPLE CHOICE. (4 points each)

Questions 1–2 are based on the following method:

```java
void nPrint(String message, int n) {
    while (n > 0) {
        System.out.print(message);
        n--;
    }
}
```

1) What is the printout of the call `nPrint("a", 4)`?

A. aaaaa
B. aaaa
C. aaa
D. Invalid call
E. None of the above

2) What is `k` after invoking `nPrint("A message", k+1)`?

```java
int k = 2;
nPrint("A message", k+1);
```

A. 0
B. 1
C. 2
D. 3
E. None of the above

3) What is the output for `y`?

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

A. 45
B. 9
C. 10
D. 11
E. None of the above

4) Given the array declaration below, `list[1]` is

```java
int[] list = {1, 2, 3, 4};
```

A. 0
B. 1
C. 2
D. 3
E. undefined
5) What is the value in count after the following loop is executed?

```java
int count = 0;
do {
    System.out.println("Welcome to Java");
    count++;
} while (count < 9);
System.out.println(count);
```

A. 9  
B. 8  
C. 11  
D. 10  
E. None of the above

6) When invoking a method with an object argument, ___________ is passed.

A. the object is copied, then the reference of the copied object  
B. a copy of the object  
C. the contents of the object  
D. the reference of the object  
E. None of the above

7) _______ is invoked to create an object.

A. The main method  
B. A method with a return type  
C. A method with the void return type  
D. A constructor  
E. A class

8) Given the declaration `Circle x = new Circle();`, which of the following statements is most accurate.

A. x contains an object of the Circle type.  
B. You can assign an int value to x.  
C. x contains a reference to a Circle object.  
D. x contains an int value.  
E. None of the above

9) Given the following statement

```java
int[ ] list = new int[10];
```

list.length has the value

A. 10  
B. 9  
C. 11  
D. The value depends on how many integers are stored in list.  
E. None of the above.
10) In the following code, what is the printout for list2?

```java
class Test {
    public static void main(String[] args) {
        int[] list1 = {1, 2, 3};
        int[] list2 = {1, 2, 3};
        list2 = list1;
        list1[0] = 0; list1[1] = 1; list2[2] = 2;

        for (int i = 0; i < list2.length; i++)
            System.out.print(list2[i] + " ");
    }
}
```

A. 1 2 3  
B. 1 1 1  
C. 0 1 2  
D. 0 1 3  
E. None of the above

11) Consider the following code fragment:

```java
int[] list = new int[10];
for (int i = 0; i <= list.length; i++) {
    list[i] = (int)(Math.random() * 10);
}
```

Which of the following statements is true?

A. list.length must be replaced by 10  
B. The loop body will execute 10 times, filling up the array with random numbers.  
C. The loop body will execute 10 times, filling up the array with zeros.  
D. The code has a runtime error indicating that the array is out of bound.  
E. None of the above

12) What is balance after the following code is executed?

```java
int balance = 10;

while (balance >= 1) {
    if (balance < 9) continue;
    balance = balance - 9;
}
```

A. 0  
B. 2  
C. The loop does not end  
D. 1  
E. -1
13) Suppose array a is `int[] a = {1, 2, 4};`, what is `a[1] - a[2]`?
   A. 1  
   B. -1  
   C. 2  
   D. -2  
   E. None of the above

14) What is `y` after the following switch statement?

```java
int x = 0;
int y = 0;
switch (x + 1) {
    case 0: y = 1; break;
    case 1: y = 2; break;
    default: y = 3;
}
```

A. 1  
B. 2  
C. 0  
D. 3  
E. None of the above

15) Analyze the following code. What is the value of `count` displayed?

```java
public class Test {
    public static void main (String[] args) {
        Count myCount = new Count();
        int times = 0;
        for (int i = 0; i < 100; i++)
            increment(myCount, times);
        System.out.println("count is "+ myCount.getCount());
        System.out.println("times is "+ times);
    }
    public static void increment(Count c, int times) {
        int temp=c.getCount();
        temp++;
        c.setCount(temp);
        times++;
    }
}
```

```java
public class Count {  
    private int count;
    public Count (int c) {  
        count = c;
    }
    public Count () {  
        count = 1;
    }
    public int getCount () {  
        return count;
    }
    public void setCount (int c) {  
        count=c;
    }
}
```

A. 98  
B. 101  
C. 100  
D. 99  
E. None of the above
Write your answer in the space provided.
16) (20 points) Define a class named Student that contains:

- An int data field named age that stores the age of a student.
- A String data field named sid that represents the student id.
- A constructor that accepts and creates a student object with the specified age and student id.
- The getter and setter methods for all data field.
- A toString method that returns student information including the student id and age.
- The equals method that returns true if two students have same id’s and false otherwise.
- A method findYoungest() that returns the youngest student object.
Write your answer in the space provided.

17) (15 points) Write an application TestStudent with a main method that creates two Student objects with the following specifications:

- **student1**: 21 years old, sid="123456789"
- **student2**: 19 years old, sid="987654321"

The method finds the youngest student and prints to the screen the information about that student.
Write your answer in the space provided.

18) **(20 points)** A method named `summit` that accepts 2 integer arrays named `gamma` and `delta`. If the arrays are the same size the method will return an array of the sum of the corresponding elements. If they are of different sizes the method will return an array as big as the smallest among gamma and delta arrays, where all of the elements are set to 5.