## MULTIPLE CHOICE

1. Which of the following is *not* a Java keyword?
   a. import
   b. static
   c. public
   d. void
   **e. none of the above, all are Java keywords**

2. A file containing Java code has the header:
   `public class Question`
   The file in which the source code must be stored is:
   a. Question.class
   **b. Question.java**
   c. Program.java
   d. classQuestion.java
   e. none of the above

3. The keyword "static", when used within a method definition, indicates that the method
   a. requires an object to be invoked
   b. cannot be invoked
   **c. does not require an object to be invoked**
   d. is not valid
   e. none of the above

4. In object-oriented design, an object is composed of
   a. methods
   b. variables
   **c. attributes and behaviours**
   d. variables and constants
   e. none of the above

5. The instance variables of an object should be initialized by the
   **a. constructor**
   b. creator
   c. initializer
   d. declarer
   e. none of the above

6. An accessor method
   a. is a static method
   b. changes the value of an instance variable
   c. must invoke the constructor
   d. any of the above
   **e. none of the above**

7. What is the output of the following code segment?
```
int s = 10;
int b = 8;
int value;
if  (s < b) value = s;
else if (s > b) value = b;
else value = 0;
System.out.println(value);
```
   a. 10
   **b. 8**
   c. 0
   d. 18
   e. none of the above

8. Identity equivalence implies state equivalence; that is, when one has identity equivalence, one also has state equivalence.
   **a. true**
   b. false
   c. only true for integers
   d. only false for integers
   e. none of the above

9. An array is best described as
   a. a garbage collection algorithm
   **b. a collection of data items of the same type**
   c. a simple variable
   d. data items of different types stored in the same memory location
   e. a way of mixing primitive types and reference types

10. What does the Java statement:
    `Car rental = new Car();`
    most likely do?
    **a. declares a reference variable of type Car called `rental (either a OR b)`**
    **b. creates a Car object and initializes it using the constructor that takes no parameters**
    c. nothing; statement is syntactically incorrect.
    d. declares a reference variable of type `rental` call Car
    e. none of the above

11. A method that returns a value must contain the following keyword:
    a. void
    **b. return**
    c. break
    d. public
    e. none of the above

## Short Questions

1. Write a `for` statement that can be used to loop over the decades of the 20th century (i.e. 1900, 1910, …, 1990).

**`for (int year = 1900; year < 2000; year = year+10) { … }`**

2. One wishes to output the contents of an integer variable `num` if it has a value between 30 and 40, inclusive. Write an if statement and appropriate conditions that would accomplish this?

**`if (num >=30 && num <= 40) { … }`**

3. Assign the `boolean` variables `a`, `b`, and `c` values of `true` and `false`, which make the following Boolean expression evaluate to `true`:

```
(a ||(!b && c)) || (!a && !c) || !b || (b && c)
```

**set `b= false`, then `!b` is true, and the entire expression would be true, so just set `a` and `c` to either `true` or `false`.**

4. Consider the following class definition and then answer the questions that follow.

```
public class Counter {
private int counter;
private int ops;

public Counter() {
  counter = 0; ops = 1;
  }

public int getCounter() {
  return counter;
  }

public int getups() {
  return ops;
  }

public void setCounter(int value){
  ops++;
  counter = value;
  }

public void increment(){
  ops++;
  counter++;
  }

public void decrement(){
  ops++;
  counter--;
  }
}
```

4.a. What is an example of an accessor method in class `C`? **getCounter()**

4.b. What is an example of a mutator method in class `C`? **setCounter()**

4.c. Write a constructor for the `Counter` class that takes a single parameter `n` and sets `counter` to that value and `ops` to 1.

```
public Counter(int n) {
      counter = n;
      ops = 1;
}
```

4.d. Write a method for the `Counter` class that will increment `counter` by 2 and `ops` by 1 and returns the new value of `counter`.

```
public int incrementCounter2(){
      counter = counter +2;
      ops++;
      return counter;
      }
```