READ THIS NOW!

Failure to read and follow the instructions below may result in severe penalties. Failure to adhere to these directions will not constitute an excuse or defense.

- Print your name in the space provided below.
- Print your name and ID number on the Opscan form; be sure to code your ID number on the Opscan form. Code Form A on the Opscan.
- Choose the single best answer for each question — some answers may be partially correct. If you mark more than one answer, it will be counted wrong.
- Unless a question involves determining whether given Java code is syntactically correct, assume that it is. The given code has been compiled and tested, except where there are deliberate errors. Unless a question specifically deals with Java import directives, you should assume the necessary library files have been imported.
- Note that questions about printed values disregard formatting completely.
- In questions/answers which require a distinction between integer and real values, integers will be represented without a decimal point, whereas real values will have a decimal point, [1054 (integer), 1054.0 (real)].
- When you have completed the test, sign the pledge at the bottom of this page and turn in the test and your Opscan.
- This is a closed-book, closed-notes examination. No calculators or other electronic devices may be used during this examination. You may not discuss (in any form: written, verbal or electronic) the content of this examination with any student who has not taken it. You must return this test form when you complete the examination. Failure to adhere to any of these restrictions is an Honor Code violation.
- There are 20 multiple-choice questions.
- Mark your answers on the test form, for future reference, and on the Opscan. The answers you mark on the Opscan form will be considered your official answers.

Do not start the test until instructed to do so!

Name ________________________________ (print: Last name, First)
VT PID: ________________________________ (print: campus email address)

Pledge: On my honor, I have neither given nor received unauthorized aid on this examination.

__________________________________________
signature
1) According to Polya’s 4-step process, what is the last thing to do?
   1) Devise a plan  2) Write Java code  3) Understand the problem
   4) Test the plan  5) call 4-HELP  6) none of these

2) In the Java language, to how many classes can an object belong?
   1) 1  2) 2  3) 3  4) 4  5) 5  6) 6  7) 7  8) 8  9) 9  10) 0

3) In the Java language, the semicolon (;) is a statement ______________?
   1) separator  2) generator  3) locator
   4) terminator  5) none of the above

4) Which one of the following statements describing objects and classes is false?
   1) Objects are instantiated from classes.
   2) Classes are instantiated from Objects.
   3) The behaviors of an object are the tasks it can perform.
   4) Reference variables refer to objects.
   5) All of the above are true.

5) Which of the following executes Java bytecode?
   1) CPU  2) ALU  3) Java compiler
   4) Java Virtual Machine  5) none of the above

6) In which one of the following files must the Java class named Test1 be stored?
   1) Test1.class  2) Test1.j  3) Test1.java
   4) Test1.c  5) none of the above
7) Which one of the following files would the Java compiler create from correct translation of the Java class named Test1?

1) Test1.jvm  2) Test1.exe  3) Test1.java
4) Test1.obj  5) none of the above

8) What is the value printed for the variable alpha if the following code is executed?

```java
String alpha;
alpha = "test1";
"test1".toUpperCase();
System.out.println(alpha);
```

1) test1  2) TEST1  3) Test1
4) alpha  7) ALPHA  8) None of these

9) In the following Java statement:

```java
System.out.println("exam1".toLowerCase());
```

Which of the following is the stream reference in the above statement?

1) System  2) out  3) println
4) exam1  7) toLowerCase  8) None of these

10) What is the value printed for the variable beta if the following code is executed?

```java
String alpha;
alpha = "test1";
String beta;
beta = alpha.toUpperCase();
System.out.println(beta);
```

1) test1  2) TEST1  3) Test1
4) beta  7) BETA  8) None of these

11) What is the value printed for the variable gamma if the following code is executed?

```java
String gamma;
gamma = "test1";
gamma.toUpperCase();
System.out.println(gamma);
```

1) test1  2) TEST1  3) Test1
4) gamma  7) GAMMA  8) None of these
12) What is the value printed for the variable `delta` if the following code is executed?

```java
String alpha, delta;
alpha = new String("VaTech");
delta = alpha.substring(2);
System.out.println(delta);
```

1) Va 2) aT 3) aTech
4) Tech 7) Te 8) None of these

13) What is the value printed for the variable `epsilon` if the following code is executed?

```java
String alpha, epsilon;
alpha = new String("VaTech");
epsilon = alpha.substring(2, 5);
System.out.println(epsilon);
```

1) VaTec 2) aTech 3) aTe
4) Tec 7) ch 8) None of these

14) Select the statement that follows that best describes the result of the execution of the third line in the code fragment below?

```java
String sigma;   //Line 1
sigma = "VaTech";   //Line 2
sigma = new String("Hokies"); //Line 3
System.out.println(sigma); //Line 4
```

1) The characters VaTech stored in the variable `sigma` are replaced by the characters Hokies.
2) A new string object containing the characters Hokies is created and replaces, stores over, in memory the string object that the variable `sigma` was referring to which contained the characters VaTech.
3) A new string object containing the characters Hokies is created and the variable `sigma` is set to refer to it without affecting the contents of the string object to which it is was previously referring.
4) A new string object containing the characters Hokies is created, and the contents of the string object to which the variable `sigma` refers is set to equal the characters Hokies.
5) None of these, strings are immutable in Java, references to them cannot be changed.

15) Recall that in interactive input/output in Java a prompt is a string of text that is displayed/printed to let a user know what to type/enter at the keyboard. What is the term that describes the reason why in Java simply printing a prompt, `System.out.print("Enter your Age: ");` is no guarantee that the prompt will be displayed before the user must enter the data?

1) Buffering 2) Streaming 3) Methoding
4) Concurrency 5) None of these.
16) Recall that in interactive input/output in Java a prompt is a string of text that is displayed/printed to let a user know what to type/enter at the keyboard. What method can be used, (invoked), to guarantee that a prompt will always be displayed before the user must enter the data?

1) println()  
2) System.out()  
3) trim()  
4) flush()  
5) None of these.

For the next two questions use the responses below:

1) BufferedReader kb; 
   kb = new BufferedReader(
       new InputStreamReader(System.in));
   String inLine; //input string
   inLine = kb.readLine();

2) BufferedReader fileInput;
   fileInput = new BufferedReader(
       new InputStreamReader(
           new FileInputStream(
               new File("census.data"))));
   String inLine; //input string
   inLine = fileInput.readLine();

3) BufferedReader kb;
   kb = new BufferedReader(
       new InputStreamReader(
           new FileInputStream(
               new File("System.in")));
   String inLine; //input string
   inLine = kb.readLine();

4) BufferedReader fileInput;
   fileInput = new BufferedReader(
       new InputStreamReader(
           new FileInputStream(
               new File("census.data")));
   String inLine; //input string
   inLine = fileInput.readLine();

5) None of the above

17) Which of the above code segments would read a line of input from the disk file “census.data”?

18) Which of the above code segments would read a line of input from the keyboard?
Given the following Java reference declarations:

```java
String VT = new String("Virginia Tech");
String hokie;
String VT1 = VT.substring(0,1);
String VT2 = VT.substring(7,9);
String VT3 = VT.substring(9);
```

For the next two questions use the responses below:

1)  
    hokie = VT1.concat(VT2.concat(VT3));

2)  
    hokie = VT1.concat(VT2).concat(VT3);

3)  
    hokie = VT1;
    hokie = hokie.concat(VT2);
    hokie = hokie.concat(VT3);

4)  
    System.out.println(VT1 + VT2 + VT3);

5)  
    None of the above

19) Which of the above code segments is an example of object creation through the process of cascading?

20) Which of the above code segments is an example of object creation through the process of composition?