CS141 Study Guide for in-class exam

1. Define the following terms:
   A) bit:
   B) byte:
   C) nibble:

2. Regarding computer architecture, name 3 different ways you might use to describe the state that a “bit” may be in?
   A)  
   B)  
   C)  

3. Concerning the characteristics of Main Storage. Answer the following questions as "True" or "False".
   a) The Hard-Drive's storage is volatile. ____________
   b) The Hard-Drive's storage costs more per/MegaBytes than main-memory. ____________
   c) Main-memory has a slower access time than the Hard-Drive. ____________
   d) Main-Memory's storage is volatile. ____________

4. What do these abbreviations stand for:
   KB ____________________ kb ______________________
   MB ____________________ GB _____________________
4. Let x be declared as an integer. What is the value of x after the following assignments
   a)  x = 2/3;  
   b)  x = 5/2;  
   c)  x = 1+8/4;  
   d)  x = (1+8)/4;  
   e)  x = 10/7+2;  
   f)  x = 10/(7+2);  
   g)  x = 9 % 4;  
   h)  x = 9 % 15; 

5. Suppose “y” is declared as a floating point number. What is the value of y after the following assignments:
   a)  y = 3.0/2;  
   b)  y = 3/2;  
   c)  y = 3/2.0;  

6. What is the value of the variable answer after each of the following statements given the declarations below. These are tricky - pay special attention to variable types!
   ```
   double answer = 10;
   double x = 4;
   double y = 3;
   int n = 2;
   int m = 7;
   
   a) answer += 2.5;  _________________________
   b) answer = n % m;  _______________________
   c) answer = m % n;  _______________________
   d) answer = 4*n/m;  _______________________
   e) answer = 1 + y/x;  _____________________
   f) answer = n/x;  _________________________
   ```
7. Given the declarations:

```java
int x;    int y;
char c;       String answer;
String word1;    String word2;
```

Write a Boolean expression for the following:

a. The "answer" begins with the letter Z

b. The mathematical expression 20 < x < 100

c. The character "c" is the letter "E" or "e"

d. word1 does not equal word2

e. It is "not true" that "x" and "y" are both less than 10

f. "y" is either less than 100 or more than 200.

8. For each definition, identify the index (e.g. A, B, …) of the vocabulary word it describes. Please write clearly so your answer is unambiguous.

Definitions:

i. ________ A named location in memory for holding data.

ii. ________ A sequence of characters.

iii. ________ A number used in an assignment.

iv. ________ The place a programmer can look at to read about a class’s methods.

v. ________ A variable type which contains a only single value, e.g. int, float, double

vi. ________ Combining strings to form a new string.

vii. ________ The way Java compares and orders strings.

viii. ________ Explicitly converting a value from one type to a different type.

ix. ________ A single letter, digit or symbol (e.g. ascii code).

x. ________ An input value that is used to signal the end of input.

xi. ________ Setting the value of a variable for the first time, before it is used.

A. Assignment  L. Initialization
B. Expression   M. Primitive type
C. Boolean value N. Class type
D. Relational operator O. API (Application Programming Interface)
E. Compile time error P. Boolean operator
F. Run-time error Q. A String
G. Sentinel      R. Type
H. Cast         S. Variable
I. Character     T. Lexicographic
J. Concatenation
K. Constant
8. Which of the following loops executes the statements inside the loop before checking the condition?

a) for c) do-while

b) while d) do-for

9. Assuming that a user enters 25 as the value for x, what is the output of the following code snippet?

Scanner in = new Scanner(System.in);
System.out.print("Enter a number: ");

int x = in.nextInt();
if (x < 100) {
    x = x + 5;
}
if (x < 500) {
    x = x - 2;
}
if (x > 10) {
    x++;
} else {
    x--;
}
System.out.println(x);

a) 27 c) 29

b) 28 d) 30

10. A loop inside another loop is called: ______

a) A sentinel loop c) A parallel loop
b) A nested loop d) A do/while loop

11. What is the output of the following loop? _______

for (int i = 20; i >= 2; i = i - 6) {
    System.out.print(i + ", ");
}

a) 20, 14, 8, c) 20, 14, 8, 2,
b) 14, 8, d) 14, 8, 2,
12. What is the first and last value of i to be printed by the following code snippet? ______

```java
int n = 20;
for (int i = 0; i <= n; i++) {
    for (int j = 0; j <= i; j++) {
        System.out.println("" + i);
    }
}
```

a) 0 and 20  
   c) 1 and 19  
   e) None of the above
b) 1 and 20  
   d) 0 and 19

13. What will be the output of the following code snippet? __________

```java
boolean token = false;
while (token) {
    System.out.println("Hello");
}
```

a) “Hello” will be displayed infinite times.  
   c) No output after successful compilation.  
   b) No output because of compilation error.  
   d) “Hello” will be displayed only once.

14. What is the output of the following code: __________

```java
int x = 7;  int y = 9;  int z = 5;
x = y;
y = z;
z = x;
System.out.println(x + " + y + " + z);
```

a) 9 5 9  
   c) 7 9 5  
   b) 9 5 7  
   d) 7 7 7
15. Using the following UML design as a guide, implement the "changeMoney".
*** The methods don't actually do anything, just show their form...

UML for "changeMoney" class
============================
-us: double
-jp: double
-ru: double
-mx: double
-eng: double
----------------------------
+changeMoney()
+changeMoney(double us)
+setUS(double dollar) void
+getJapan() double
+getRussian() double
+getMexican() double
+getEngland() double

16. Write a for-loop that prints the integers from "a" to "b" backwards.

17. Write a while-loop that output 1 to 10, inclusive.