

Name _____

CMPS12A Practice Midterm 1

January 30, 2006

This is a closed notes, closed book practice midterm.

... Actually you can do what you want, it's for your practice. I just recommend that.

Note: If you are asked to write code, you must declare all variables. If you are asked to just write a portion of code, you only need to write what is asked for. If you are asked to write a whole program, you must include everything (like the class, main, and import). Assume that whenever Scanner is used in the code given to you that this is at the top of the program: import java.util.*;

1. Assume the given declarations and fill in the value of the expression or x if it is illegal. If it is illegal, why?

```
int a = 3, b = 7, c = 0;
```

<u>expression</u>	<u>value</u>	<u>expression</u>	<u>value</u>
a + b - c	_____	a >= b	_____
b && c	_____	b % c	_____
a = ++c	_____	a + b * c	_____
2*(c-3)	_____	a/b	_____
b/a	_____	a - (b - 1)	_____

2. Below is a list of java keywords, identifiers, constants, operators, and some illegal stuff. Write down next to each what it is, and if it is a constant, what type it is, if known.

- | | | | |
|----------------|----------------|--------------|---------------|
| x _____ | "321" _____ | 3two1 _____ | 4 _____ |
| 'm' _____ | "20#\$&" _____ | double _____ | nextInt _____ |
| rAnD0m _____ | *gaze _____ | hello _____ | for _____ |
| continue _____ | String _____ | class _____ | * _____ |
| main _____ | boolean _____ | 1up _____ | last1 _____ |
| long _____ | % _____ | ' ' _____ | "int" _____ |

3. What is the exact output of the following program?

```
class Question3 {
    public static void main (String[] args) {
        String foo = "twenty";
        int bar = 7;

        System.out.println (foo + bar);
    }
}
```

4. Write a few lines of java code to declare three variables of type double called num1, num2, and product. Give num 1 the value of 4.5 and num2 the value of 2.3, and then multiply them and store them in product.

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5. What is printed by the following program fragment given an input of 28?

```
Scanner in = new Scanner (System.in);
int x = in.nextInt();
if (x <= 37)
    System.out.println ("bar");
else
    System.out.println ("foo");
```

6. What is printed by the following program fragment given an input of 23?

```
Scanner scan = new Scanner (System.in);
int x = scan.nextInt();
while (x > 0) {
    System.out.print (x + "_");
    x = x/2;
}
System.out.println ("...");
```

7. What is printed by the following program fragment for an input of 8?

```
Scanner input = new Scanner (System.in);
int x = in.nextInt();
if (x <= 19)
    System.out.println ("first");
else if (x <= 9)
    System.out.println ("second");
else
    System.out.println ("third");
```

8. What is printed by the following program fragment? Warning: Trick question?

```
int x = 3, y = 1, z = 2;
if (x == y)
if (z > y)
    System.out.println ("greater");
else
    System.out.println ("less");
```

9. Write a while loop to repeatedly ask the user for two integers and multiply them and print out the result until the user types a zero for one of the two numbers. If a zero is typed, print out the result and then exit the loop.

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10. Write a for loop that prints out the even numbers between 8 and 26 in reverse order, each on a different line.

11. What does this program do? Be specific.

```
import java.util.*;

class Question11 {
    public static void main (String[] args) {
        int i, j, t, n;
        Scanner in = new Scanner (System.in);

        System.out.println ("Please enter a number: ");
        n = in.nextInt();

        for (i = 1, j = 1; i <= n; j+=t) {
            System.out.println (i);
            t = i;
            i = j;
        }
    }
}
```

12. On the line provided, complete the following program so that if the user types in their name, e.g. "Matthew", the program will respond with "Hey, " followed by their name, followed by ". What's up?", e.g. "Hey, Matthew. What's up?".

```
import java.util.Scanner;

class WhatsUp {
    public static void main (String[] args) {
        Scanner input = new Scanner(System.in);
        String name;
        name = input.nextLine();

        _____

    }
}
```

13. What does the following program print?

```
class Question13 {
    public static void main(String[] args) {
        String s1 = "first";
        String s2;
        s2 = s1;
        System.out.println("s2 is " + s2);
        s2 = "second";
        System.out.println("s2 is " + s2);
        System.out.println("s1 is " + s1);
    }
}
```

14. What is the value of the Java expression 45/7? _____

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14. What *primitive* Java type can store the largest numbers?

- A. BigInteger B. double C. float D. int E. long

15. Circle each of the following that is a legal identifier:

- A. someName B. some_name C. some\$name D. some name E. some+name
 F. some123Name G. \$someName H. _someName I. 123someName

16. What is the most descriptive phrase for reading the Java expression $x = y$? _____ For the Java expression $x == y$? _____

- A. x equals y
 B. is x equal to y?
 C. make x and y be equal
 D. x is assigned the value of y
 E. y is assigned the value of x

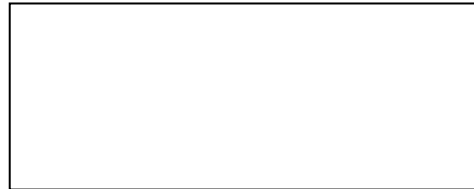
17. What is printed by the following program fragment? **Warning: This may be a trick question.**

```
x = 10;
y = 20;
z = 30;
if (x > y)
    if (x > z)
        System.out.println("x is biggest");
else
    System.out.println("x is not biggest");
```

- a. x is biggest
 b. x is not biggest
 c. there is no output

18. What is printed by the following loop?

```
int i = 1;
while (i <= 107) {
    if (i % 33 == 0)
        System.out.print(i + ".");
    i = i + 1;
}
```



19. How many times does the following print "java"? _____ How many times does it print "cs12a"? _____

```
int i = 1;
if (i < 15 ) {
    while (i < 40) {
        System.out.println("java");
        i = i + 1;
    }
    System.out.println ("cs12a");
}
```

20. How many times will the following loop print "in for loop"?

```
for (int i = 1; i != 10; i = i + 2) {
    System.out.println("in for loop");
}
```

- a. 0
 b. 5
 c. 9
 d. 10
 e. more than 10

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21. What does the following program fragment print?

```
int x = 4;
if (x < 9)
    System.out.println("less than 9");
else if (x < 25)
    System.out.println("less than 25");
else
    System.out.println("neither");
```

22. What does the following program fragment print?

```
int j = 10;
for (int i = 1; i <= 3; ++i) {
    System.out.println(i + "." + j);
    j = j - 3;
}
```

23. What does the following program fragment print assuming x is 10 and y is 20? **Caution, this fragment contains a common programming error.** How would you fix this so that it prints the biggest number?

```
if (x < y);
    System.out.println(y + " is bigger");
if (y < x);
    System.out.println(x + " is bigger");
```

24. What does the following program fragment print?

```
int height = 5;
int dots = height - 1;
int howMany = 1;
for (int row = 1; row <= height; row++) {
    for (int j = 1; j <= dots; j++)
        System.out.print(".");
    for (int j = 1; j <= howMany; j++)
        System.out.print(howMany);
    howMany = howMany + 2;
    dots--;
    System.out.println();
}
```

25. Write the commands you would use to compile and run a java program called Question25.java.

26. Write a switch statement that takes an integer that holds a number from 1 to 12, and outputs the corresponding season. If the number does not match, output "Huh?".

Note: Months 12, 1, 2 (Dec, Jan, Feb) – Winter; 3, 4, 5 (Mar, Apr, May) – Spring; 6, 7, 8 (Jun, Jul, Aug) – Summer; 9, 10, 11 (Sep, Oct, Nov) - Fall

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27. In the following program, there are a lot of syntax and runtime errors. This program is supposed to be able to compute your grade. It will prompt the user to input grades for 10 assignments, and output the result. It will also loop if the user wishes to enter another student. See if you can discover and correct all of the errors.

/ This program reads in 10 grades and spits out onto the screen what grade the student has in the class./

```
import java.util.*;

class Question27 {
    public static int main (String[] args) {
        Scanner in = new Scanner (System.in);
        int grade, i;
        double total = 0.0;
        string again = yes;

        // Do while user wants to do this again.
        while (again == "yes"); {

            // Input 10 grades
            for (int i = i; i < 11; i++); {
                System.out.print ("Enter the grade for assignment # " +
                    i + ": ");
                grade = in.nextInt();
                total += grade;
            }

            // Determine the grade
            if (total >= 90)
                System.out.println ("You have an A");
            else if (total >= 80)
                System.out.println ("You have a B");
            else if (total >= 70)
                System.out.println ("You have a C");
            else if (total >= 60)
                System.out.println ("You have a D");
            else
                System.out.println ("You are failing this class.")

            // Checks if user wants to use this again
            System.out.println ("Would you like to use this again? y/n");
            again = in.next();
        }
    }
}
```

28. In question 27, why can't we use a switch statement for the grade assignments?

29. Fill in the rest of the code so that char c contains the first character of the String the user inputs.

```
String s;
char c;
Scanner in = new Scanner (System.in);
System.out.println ("Do you want to continue? y/n");
```

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CMPS12A Study Guide

Major Topics We've Covered

- ✓ When executing a program, the compiler immediately looks for public static void main(String [] args) to run.
- ✓ boolean expressions: these include
 - relational operators: <, <=, >, >=
 - equality operators: ==, !=
- ✓ if/else statements: either do it or don't or do something else
 - if (boolean expression) {
 - // do this if boolean expression evaluates to true
 - }
 - else {
 - // do this if boolean expression evaluates to false
 - }
 - You can have nested if/else statements, as well as if/else if/else statements.
 - The else statement refers to the previous if. Caution on curly braces, as they can confuse the logic. When comparing seeing what else matches what if, ignore the blocks as what is inside is done once outside a block.
- ✓ switch statements: if/else if/else – used with integer/char, and only checks for equality
 - switch (identifier) {
 - case <value checking for>:
 - <statement>
 - break;
 - default:
 - <statement>
 - break;
 - }
- ✓ blocks: When a variable is defined, it only stays defined for the block it is defined in. This is normally determined by the set of curly braces {}. Once the block ends, the variable ceases to exist.
- ✓ logical operators:
 - && AND (Both must be true)
 - || OR (Either is true)
 - !(boolean expression) NOT (True if boolean expression is false and vice versa)
- ✓ while loops: keep doing this until I say stop
 - while (boolean expression) {
 - // do while boolean expression is still true
 - }
 - Remember that you must update a variable in the boolean expression, or the loop will cycle forever.
- ✓ for loops: do the initialization once when loop hasn't started, run loop if boolean expression is true, update expression, repeat loop if boolean still true
 - for (initialization, boolean expression, update expression) {
 - // do this until boolean expression is false
 - }
 - Great for going through lists of things
- ✓ comments: Two types of comments
 - /* */ Mainly used for multi-line comments; anything inside these is treated as white space.
 - // Mainly used for a single line comment; anything after this on the same line is treated as white space.
- ✓ keywords – built in java words that are used for something in java. You cannot use these for an identifier. These are always lowercase. Example: break, continue, int, float, double, class
- ✓ identifiers – the names for variables used throughout a java program. These must start with a letter, _, or \$, and can contain any of those and digits. Java style has uppercase letters to start new words. Example: x, nextInt, HelloWorld, WhatsUp1
- ✓ Type conversion
 - When performing an operation with a double and any other numeric type, it is converted to a double. Then float, then long, and finally, int.
 - If you want to force a conversion from double to int: int i = (int)sum; // double sum;
- ✓ Order of operations
 - Parenthesis are done first.
 - Multiplication and Division are done left to right.
 - Addition and Subtraction are done left to right.