Sample Answers

CSE 20

Sample Midterm Answers Time: 50 minutes

Name	Section (or TA):
ANSWERS	

The following precedence table is provided for your use:

Precedence of Operators		
()		
- (unary), !, ++,		
*, /, %		
+ , - (binary)		
<, <=, >, >=		
==,!=		
&&		
=, +=, -=, *=, /=, %=		

Otherwise left to right

Total Possible Points = 200

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1. Potpourri (40 pts)

1(a). (10 pts) We want the following output

```
Hi, I interviewed Anomis.
She likes to play Golf.
Her weight in lbs is 22.
```

Fill in the missing code to get the above output using variables kg and hobby:

```
int kg = 10; // 1 kg = 2.2 lbs
String hobby = "Golf";

System.out._println__("Hi, " + "I interviewed Anomis." );

System.out._print___("She likes to play ");

System.out.println( hobby );

System.out._println__("Her weight in lbs is " + (int) (kg * 2.2) + "." );
```

1(b). (20 pts) Match the following statements (i-v) to the outputs (A-J) they produce. **Note: that there are no duplicate answers** ('A' has the value 65)

- (i) System.out.println("OUTPUT is " + (char) ('A' + 2)); _____C____
- (ii) System.out.println("OUTPUT is " + (char) 'A' + 2); _____J____
- (iii) System.out.println("OUTPUT is " + (int) 'A' + 2); ____H____
- (iv) System.out.println("OUTPUT is " + (int)('A' + 5/4)); ____E___
- (v) System.out.println("OUTPUT is " + (char)('A' + 5/4)); ____B____
 - (A) OUTPUT is A
 - (B) OUTPUT is B
 - (C) OUTPUT is C
 - (D) OUTPUT is 65
 - (E) OUTPUT is 66
 - (F) OUTPUT is 67
 - (G) OUTPUT is 651
 - (H) OUTPUT is 652
 - (I) OUTPUT is A1
 - (J) OUTPUT is A2

1(c). (10 pts) Write the println statement so it behaves correctly. You must use **ONLY** variables *charA* and *charB* in your solution. ('A' has the value 65 and 'B' has the value 66)

```
A + B is 131
```

```
char charA = 'A', charB = 'B';
System.out.println(charA + " + " + charB + " is " + (charA+charB) );
```

2. Expressions (40 pts)

Given the following variables, for each expression state whether it is legal or illegal. If the expression is **legal**, state what the result is. If the expression is **illegal**, state the type of the error (compile, logical or run-time). (Show your steps in evaluating the expression to get partial credit)

int x = 5, y = -1, z = 0; boolean b1 = true, b2 = false, b3 = false;

- (a) -y + x
- legal illegal _____6_
- (b) x + y * z
- *legal* illegal 5

(c) !x

- legal illegal compile
- (d) z / y < x
- *legal* illegal true
- (e) $x < y \parallel z > x$
- legal illegal _____false____
- (f) x + y / z
- legal *illegal* ____run-time___

(g) !b2

- legal illegal true_____
- (h) b3 || b2 && b1
- legal illegal _____false____
- (i) (x != y) & !b2
- *legal* illegal true
- (j) x + y > z && b1
- legal illegal ____true___

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3. Control Flow Statements (40 pts)

3(a) (24 pts) Complete the Java expressions that would appear in the if statements below to test for each of the following conditions using variables x and y.

- a. x is less than or equal to 15 if ($x \le 15$
- b. x is not between -5 and 5 if ([x > -5 & x < 5]) or x <= -5 | x >= 5
- c. x absolute value is not equal to 100 if (x = 100 & x = -100)
- d. both x and y are positive if (x > 0 & y > 0)
- e. x divided by y is greater than 1 if (x/y>1 or x>y)
- f. x plus y is negative if (x+y<0)

3(b). (16 pts) For each value of score below, give the output from the execution of the following program segment

Scanner input = new Scanner (System.in);
char grade;
int score = input.nextInt();
if (score >= 900) grade = 'A';
else if (score >= 800) grade = 'B';

if (score >= 700) grade = 'C';
else if (score >= 600) grade = 'D';
else grade = 'F';

System.out.println("Your grade is " + grade);

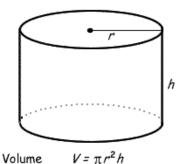
- a. score = 850
- b. score = 750 C
- c. score = 650 D
- d. score = -100 F

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4. Coding (40 pts)

In lab 4, we gave an example of how to calculate the average of two numbers. For this question, you will be creating a similar program that calculates the area and volume of a cylinder. (pi or π is 3.14)

Therefore the Formula is: $A = 2\pi r^2 + 2\pi rh$



Here are the steps the program should perform:

- 1. Create a variable called *radius* and a variable called *height*.
 - 2. Ask the user to enter a <u>double</u> for the radius.
 - 3. Ask the user to enter a <u>double</u> for the height.
 - 4. Print the area of the cylinder.
 - 5. Print the volume of the cylinder.

Here is a sample run of what the program should look like:

```
Enter Radius 2
Enter Height 3
Cylinder Area 62.8
Cylinder Volume 37.68
```

ANSWER HERE:

```
import java.util.Scanner;
public class Cylinder {
      public static void main(String[] args) {
            final double pi = 3.14;
            double radius, height, area, volume;
            Scanner kbd = new Scanner(System.in);
            System.out.print("Enter Radius ");
            radius = kbd.nextDouble();
            System.out.print("Enter Height ");
            height = kbd.nextDouble();
                   = 2*pi*radius*radius + 2*pi*radius*height;
            volume = pi*radius*radius*height;
            System.out.println("Cylinder Area " + area);
            System.out.println("Cylinder Volume " + volume);
      }
}
```

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5. Numbers (40 pts)

Fill in the following chart with equivalent values for each base $(16^3 = 4096, 16^2 = 256)$. You may leave the answer as a formula D*B^p if you so desire (first two rows are 2 pts each and the rest are 4 pts):

Decimal (Base 10)	Binary (Base 2)	Hexadecimal (Base 16)
10	1010	0xA
2	10	0x2
16	1 0000	0x10
255	1111 1111	θxFF
15*4096 + 10*256 + 5*16+1 or 64081	1111 1010 0101 0001	0xFA51
10*4096+11*256+12*16+13 or 43981	1010 1011 1100 1101	0xABCD