CPSC 219 Extra review and solutions

Multiple choice questions:

Unless otherwise specified assume that all necessary variable declarations have been made.

For Questions 1 – 6 determine the output of the `print() or println()`

1)

```
x = 12;
s = "";
if (x > 0)
{
    s = s + "a";
}
s = s + "b";
System.out.print(s);
```

a. a
b. b
c. s
d. ab
e. None of the above

2)

```
x = -12;
s = "";
if (x > 0)
    s = s + "a";
else
    s = s + "b";
s = s + "c";
System.out.print(s);
```

a. c
b. s
c. ac
d. bc
e. None of the above

3)

```
x = 11;
s = "";
if (x > 0)
    s = s + "a";
if (x > 10)
    s = s + "b";
if (x > 100)
    s = s + "c";
System.out.print(s);
```

a. a
b. b
c. c
d. ab
e. abc

4)

```
x = 11;
s = "";
if (x > 0)
    s = s + "a";
else if (x > 10)
    s = s + "b";
else if (x > 100)
    s = s + "c";
System.out.print(s);
```

a. a
b. b
c. c
d. ab
e. abc

5)

```
x = -1;
y = 1;
s = "";
if ((x > 0) && (y > 0))
    s = s + "a";
else
    s = s + "b";
s = s + "c";
System.out.print(s);
```

a. a
b. b
c. ac
d. bc
e. None of the above

6)

```
x = -1;
y = 1;
s = "";
if ((x > 0) || (y > 0))
    s = s + "a";
else
    s = s + "b";
s = s + "c";
System.out.print(s);
```

a. a
b. b
c. ac
d. bc
e. None of the above

For Questions 7 – 11 specify the number of times that the loop will execute.

7)

```
i = 1;
while (i < 4)
{
    System.out.print(i + " ");
    i = i + 1;
}
```

a. 0
b. 1
c. 3
d. 4
e. Loop never ends

8)

```
i = 0;
while (i < 4) {
    System.out.println(i);
    i = i + 1;
}
```

a. 0
b. 1
c. 3
d. 4
e. Loop never ends

9)

```
i = 0;
while (i < 4)
{
    System.out.print(i + " ");
    i = i + 1;
}
```

a. 0
b. 3
c. 4
d. 5
e. Loop never ends

10)

```
i = 0;
while (i < 4) {
    System.out.print(i + " ");
    i = i + 1;
}
```

a. 0
b. 3
c. 4
d. 5
e. Loop never ends

11)

```
i = 1;
while (i < 21) {
    System.out.print(i + " ");
    i = i * 3;
}
```

a. 0
b. 1
c. 3
d. 20
e. 21

For Questions 12 – 14 determine the output of the `print() or println()`

12)

```
s = "";
x = 66;
y = -66;
z = 0;
if (x > 12) {
    s = s + "a";
    if (y < 0) {
        s = s + "b";
    }
    if (z > 0) {
        s = s + "c";
    }
    s = s + "d";
}
System.out.println(s);
```

a. a
b. ad
c. abd
d. acd
e. abcd

13)

```
s = "";
x = 66;
y = -66;
z = 0;
if (x > 12) {
    s = s + "a";
    if (y < 0) {
        s = s + "b";
        if (z > 0) {
            s = s + "c";
        }
    }
}
s = s + "d";
System.out.println(s);
```

a. a
b. ad
c. abd
d. acd
e. abcd

14)

```
i = 0;
sum = 0;
while (i < 6) {
    if (i <= 3) {
        sum = sum + i;
    }
    i = i + 1;
}
System.out.println(sum);
```

a. 6
b. 9
c. 21
d. 123456
e. None of the above

For Questions 15 – 16 you are to determine the output of the corresponding program or program fragment.

15)

```
int b;
Random aGenerator = new Random();
b = aGenerator.nextInt(100)+1;
if ((b <= -1) || (b > -1))
    System.out.println("Doh!");
else
    System.out.println("Woohoo!");
```

a. a
b. Doh
c. Doh!
d. Doh!
   Woohoo!
e. None of the above

16) What will be the output of the following program?

```
int num1 = 2;
int num2 = 4;
int num3 = ++num1 * num2++;
System.out.println(num3);
```

a. 0
b. 8
c. 12
d. 15
e. None of the above

17) How many times will the following loop execute?

```
int i = 2;
do {
    i++;
}
while (i < 10);
```

a. 1
b. 8
c. 9
d. This is an endless loop
e. There is a syntax error in the statements of the loop

18) Which of the following is an instance of class `Foo`?

```
public class Foo {
    private int num;
    public Foo () { num = 0; }
    public int getNum () { return num; }
    public void setNum (int n) { num = n; }
}
public class Driver {
    public static void main (String [] args) {
    Foo [] fooey;
    fooey = new Foo [14];
    }
}
```

a. num
b. fooey
c. fooey[0]
d. fooey[13]
e. None of the above is an instance of class Foo.

Answer: E

For Questions 19 & 20 please refer to the following program.

```
public class Calls {
    public void meth1 () {
        System.out.println("meth1");
    }

    public void meth2 () {
        // First question:
    }
}
```

```
public class Driver {
    public static void main (String [] args) {
        Calls aCall = new Calls();
        // Second question:
    }
}
```

19) Based on what you see in the class definition: Within the body of '`meth2()`' which of the following is the proper way to invoke '`meth1()`'?
    a. meth1();
    b. this.meth1();
    c. aCall.meth1();
    d. (a) & (b)
    e. All of the above

20) Based on what you see in the class definition: Within the body of '`main()`' which of the following is the proper way to invoke '`meth1()`'?
    a. meth1();
    b. this.meth1();
    c. aCall.meth1();
    d. (a) & (b)
    e. All of the above

Short answer:

Short answer 1

Modify the following Java program so the variable '`result`' will be the resulting exponent of '`base`' raised to the value stored in the variable '`power`':

- Base = 2, power = 3, result = 2^3 = 8
- Base = 1, power = 12, result = 1^12=1
- Base = 55, power = 0, result = 55^0=1

You must not use functions or methods built into Java that will calculate an exponent for you. Instead you must write the code yourself.

- After calculating an exponent; the program will prompt the user to quit. If the user enters anything other than an option to quit ('`q`' or '`Q`') it will re-prompt for the base and power and calculate a new resulting exponent.
- If the user enters a negative value for either the base or power then the program will display a helpful error message (e.g., "`base and exponent must be zero or greater`")

```
// Write your answer here
import java.util.Scanner;

public class Exponent
{
    public static void main(String [] args)
    {
        int base;
        int power;
        int result;
        int i;
        String answer;
        Scanner in;
```

Short answer 2:

Part (a)

Draw out a UML class diagram for class `Person` (full version of class diagram with all details).

```
public class Person {
    private int age;
    public int getAge() {  return(age);  }
    public void setAge(int anAge) {  age = anAge;  }
}
```

Part (b)

Draw a UML class diagram showing the relationship between children and their parents. You are to use a single class diagram. You don't however have to worry about attributes, just focus on representing the relationship. You can assume that each person has up to two parents and that parents can have zero up to 50 children.

Short answer 3:

Write an accessor/get and mutator/set method for the following class definition.

```
public class Student  {
    private int identificationNumber;
    public Student () {
        identificationNumber = -1;
    }
    // Accessor




    // Mutator



}
```

Short answer 4:
In the space provided you are to specify the output of the following program.

```
public class Tracer {
    private int x;
    private int y;
    public Tracer() {
        x = 7;
        y = 13;
    }
    public Tracer(int x, int y) {
        this();
        this.x = x;
        y = y * 2;
    }
    public void display() {
        System.out.println(x + " " + y);
    }
    public void method() {
        int x = 2;
        x = x * 10;
        y = x + y;
    }
    public void method(int a) {
        x = a;
        y = this.y * 2;
    }
}

public class Driver {
    public static void main(String [] args) {
        Tracer aTracer = new Tracer();
        aTracer.display();
        aTracer = new Tracer(888,666);
        aTracer.display();
        aTracer.method();
        aTracer.display();
        aTracer.method(707);
        aTracer.display();
    }
}
```

<< **Write your answer here** >>

Short answer 5:
Using the code for class '`Driver`' and class '`Survey`' you are to implement the following capabilities. The solution will be implemented in the methods of the `Survey` class. It will start by asking 3 questions. At start the person has a 0% chance of catching the illness. The answer to each question will determine the additional probability of catching the illness.

Age:

- 21 years or younger: 0% added to probability
- 22 to 45 years old: 2% added to probability
- 46 - 65 years old: 4% added to probability
- Over 65 years old: 8% added to probability

Drinking frequency:

- Don't drink: 0% added to probability
- One drink a month: 2% added to probability
- One drink a week: 4% added to probability
- One or more drinks a day: 8% added to probability

Smoking frequency:

- Non smoker: 0% added to probability
- One pack a week: 2% added to probability
- One pack day: 4% added to probability
- More than one pack a day: 8% added to probability

After asking these three question the program will then determine if the person has caught the illness or not (display result to user).

```
public class Survey {
    public static final int NO_EFFECT = 0;
    public static final int LOW_EFFECT = 2;
    public static final int MEDIUM_EFFECT = 4;
    public static final int HIGH_EFFECT = 8;
    public static final int NUMBER_PERCENTAGES = 100;
    private Scanner in;
    private Random aGenerator;



    public Survey() {
        in = new Scanner(System.in);
        aGenerator = new Random();
        << Additional constructor code here >>



    }
```

<< **Start of answer space** >>

```
public void askDrinking() {
    System.out.println("(0) Don't drink");
    System.out.println("(1) One drink a month");
    System.out.println("(2) One drink a week");
    System.out.println("(3) One or more drinks a day");




}

public void askSmoking() {
    System.out.println("(0) Non smoker");
    System.out.println("(1) One pack a week");
    System.out.println("(2) One pack day");
    System.out.println("(3) More than one pack a day");









}

public void askAge() {
    System.out.println("(0) 21 years or younger");
    System.out.println("(1) 22 to 45 years old");
    System.out.println("(2) 46 - 65 years old");
    System.out.println("(3) Over 65 years old");









}
```

(More answer space)

```
public class Driver {
    public static void main(String [] args) {
        Survey aSurvey = new Survey();
        aSurvey.start();
    }
}
```