CPSC 219: Midterm #1 extra review

Short answer questions:

Short answer 1:

Using nested loops write a program that will display a multiplication table for products from basic grade school math: (1 * 1) = 1 up to (12 * 12) = 144. Products should be separated by spaces to make them more legible. The table below displays all the products (extra-extra practice if you want to display column and row headings).

```
  1   2   3   4   5   6   7   8   9  10  11  12
  2   4   6   8  10  12  14  16  18  20  22  24
  3   6   9  12  15  18  21  24  27  30  33  36
  4   8  12  16  20  24  28  32  36  40  44  48
  5  10  15  20  25  30  35  40  45  50  55  60
  6  12  18  24  30  36  42  48  54  60  66  72
  7  14  21  28  35  42  49  56  63  70  77  84
  8  16  24  32  40  48  56  64  72  80  88  96
  9  18  27  36  45  54  63  72  81  90  99 108
 10  20  30  40  50  60  70  80  90 100 110 120
 11  22  33  44  55  66  77  88  99 110 121 132
 12  24  36  48  60  72  84  96 108 120 132 144
```

<< Write your answer here >>

Short answer 2:

A simple tax program. prompt the user for the gross taxable income. Based on the tax rates shown in the table below the program should calculate the amount of tax owed. Finally it should display: the original gross taxable income, the amount of tax deducted and finally the income net of taxes.

Gross taxable income	Tax rate
$0 – 20,000	10% for each dollar in this range
Over $20,000 to $65,000	15% for every dollar above 20,000 up to and including $65,000
Over $65,000 to $100,000	20% for every dollar above 65,000 up to and including $100k
Over $100,000	25% for every dollar over $100,000

Example:
Gross taxable income = $21,000

- $20,000 is taxed at the rate of 10% = $2,000 deducted for this bracket
- The surplus over $20,000 = $1,000 is taxed at the rate of 15% = $150.
- Total tax deducted = $2,000 (first tax rate) + $150 (second tax rate) = $2,150.

Short answer 3:

What is the output of the following program?

```
public class Series {
    public static void main(String [] args) {
        int i = -1;
        i = 1;
        while (i <= 100) {
            if (i < 10) {
                System.out.print(i + " ");
                i = i + 1;
            }
            else if (i < 25) {
                System.out.print(i + " ");
                i = i * 2;
            }
            else if (i <= 75) {
                System.out.print(i + " ");
                i = i + 20;
            }
            else {
                System.out.print(i + " ");
                i = i + 2;
            }
        }
    }
}
```

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

Short answer 4:

What is the output of the following program?

```
public class Tracer {
    private int x;
    private int y;
    public Tracer() {
        x = 8;
        y = 88;
    }

    public void setX(int num) { x = num; }
    public void setY(int num) { y = num; }

    public void m1() {
        int t = x;
        x = y;
        y = t;
    }

    public void m2() {
        int x = y;
        y = x;
    }
    public void show() {  System.out.println(x + " " + y);  }
    public void showIt() {  System.out.println(x + y);  }
}

public class TracerDriver {
    public static void main(String [] args) {
        Tracer t = new Tracer();
        t.show();
        t.setX(13);
        t.setY(7);
        t.show();
        t.m1();
        t.show();
        t.m2();
        t.showIt();
    }
}
```

<< **Writer your answer here** >>

Multiple choice questions:

NOTE: <TAB>=TAB <SP>=SPACE <NEWLINE>=CURSOR MOVES TO NEXT LINE

For Questions 1 – 2 you are to specify how many times the corresponding loop will execute.

1)

```
int i = 10;
while (i <= 5) {
    System.out.print(i);
    i = i + 1;
}
```

a. 0
b. 1
c. 6
d. 10
e. This is an endless loop

2)

```
for(int i=100; i<0; ++i) {
    System.out.print(i);
    i = i + 1;
}
```

a. 0
b. 1
c. 100
d. 101
e. This is an endless loop

For Questions 3 – 5 you are to specify the output of the corresponding program.

3)

```
char a = '-';
switch (a) {
    case '1':
        System.out.print('a');
        break;
    case '2':
        System.out.print('b');
        break;
    case '3':
        System.out.print('c');
        break;
    case '4':
        System.out.print('d');
        break;
 }
 System.out.print("e");
```

a. a
b. ae
c. 1
d. 1e
e. e

4) (May come from a section not yet covered)

```
i = 33;
System.out.printf("%3d%-3d%2s", i, i, "A");
```

a. iiA
b. <SP>3333<SP><SP>A
c. 33<SP><SP>33A<SP>
d. <SP>33<SP>A<SP>
e. %3d%-3d%2s

5)

```
System.out.println("t\tn\n\ta\tb");
```

a. ttnntatb
b. t\tn\n\ta\tb
c. t<TAB><NEWLINE><TAB>a<TAB>b
d. <TAB><TAB><NEWLINE><NEWLINE><TAB>a<TAB>b
e. T<TAB>n<NEWLINE><TAB>a<TAB>b

6) Which of the following is a Java constant?
a. int x = 1;
b. long x = 3;
c. final char x = ‘x’;
d. constant int x = 1’
e. CONSTANT = 12;

7) Which of the following is the correct minimum number of statements needed to *declare and initialize an array* with guaranteed starting values?

a.
```
anArray = [];
```

b.
```
anArray = [1,2,3];
```

c.
```
int [] anArray;
```

d.
```
int [] anArray = new int[3];
```

e.
```
int [] anArray = new int[3];
   for (int i = 0; i < 3; i++) { anArray[i] = -1; }
```