

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:

Write a progressive version of a tax program. You are given the code to 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)

```
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. ttntatb
- 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; }