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|---------------------|---|---|-------------------------------|
|                     |   | <h1 style="text-align: center;">King Saud University</h1> <p style="text-align: center;">College of Computer and Information Sciences<br/>Computer Science Department</p> |                               |
|                     |   |   |                               |
|                     |   | Course Code:  | CSC 111                       |
|                     |   | Course Title:   | Introduction to Programming 1 |
|                     |   | Semester:   | Fall 2016-17                  |
|                     |   | Exercises Cover Sheet:  | <b>Mid 2 Exam A</b>           |
|                     |   | Duration: 90 min  |                               |
| Student Name:       |   |   |                               |
| Student ID:         |   |   |                               |
| Student Section No. |   |   |                               |
|                     |   |   |                               |
| Tick the Relevant   | Computer Science B.Sc. Program ABET Student Outcomes  | Question No. Relevant Is Hyperlinked  | Covering %                    |
| √                   | a) Apply knowledge of computing and mathematics appropriate to the discipline;  | 1,2   | 50%                           |
|                     | b) Analyze a problem, and identify and define the computing requirements appropriate to its solution;   |   |                               |
|                     | c) Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;  |   |                               |
|                     | d) Function effectively on teams to accomplish a common goal;   |   |                               |
|                     | e) Understanding of professional, ethical, legal, security, and social issues and responsibilities;   |   |                               |
|                     | f) Communicate effectively with a range of audiences;   |   |                               |
|                     | g) Analyze the local and global impact of computing on individuals, organizations and society;  |   |                               |
|                     | h) Recognition of the need for, and an ability to engage in, continuing professional development;   |   |                               |
| √                   | i) Use current techniques, skills, and tools necessary for computing practices.   | 1,2   | 50%                           |
|                     | j) Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices; |   |                               |
|                     | k) Apply design and development principles in the construction of software systems of varying complexity;   |   |                               |

**Question 1. (5 Marks)**

Put your answers of the question 1 (**multiple choice questions**) in the following table:

| Question | Answer |
|----------|--------|
| 1        |        |
| 2        |        |
| 3        |        |
| 4        |        |
| 5        |        |
| 6        |        |
| 7        |        |
| 8        |        |
| 9        |        |
| 10       |        |
| 11       |        |
| 12       |        |

1) Which of the following is not nested loop?

- a)     for (i=0; i<10; i++)  
          for (j=1; j<i+2; j++)
  - b)     for (i=0; i<10; i++)  
          System.out.println(i);  
          for (j=1; j<i+2; j++) System.out.println("j="+j);
  - c)     for (i=0; i<10; i++)  
          while (j%2!=0) { System.out.println(j+" "+(++j)); }
  - d)     for (i=0; i<10; i++) {  
          System.out.println(i)  
          for (j=1; j<i+2; j++) System.out.println("j="+j); } }
- 

2) Which for loop is equivalent to the following while loop

```
x=1;  
while (x<10) {  
    System.out.println(x+" ");  
    ++x;  
}
```

- a) for (x=1; x<10; x++) {System.out.println(x+" "); }
  - b) for (x=0; x<=10; x++) {System.out.println(x+" "); }
  - c) for (x=1; x<=10; ++x) {System.out.println(x+" "); }
  - d) for (x=0; x<=10; ++x) {System.out.println(x+" "); }
- 

3) What values of j and k will make this program print hello?

```
int j = -----;  
int k = -----;  
for (int i = j; i < k; i++) {  
    j++;  
    System.out.println("hello");  
}
```

- a) j = 5, k = 4
- b) j = 1, k = 2
- c) j = 3, k = 2
- d) j = 9, k = 5

4) Which of the pattern is produced by the following code?

```
int i, j, k;  
for (i = 1; i <= 7; i++) {  
    for (j = 1; j <= i; ++j)  
        System.out.print(j);  
    for (k = 7 - i; k >= 1; k--)  
        System.out.print("*");  
    System.out.println("");  
}
```

| a)      | b)      | c)         | d)      |
|---------|---------|------------|---------|
| *****1  | 1234567 | 1*****     | 7654321 |
| *****21 | 123456* | 12*****    | *654321 |
| ****321 | 12345** | 123*****   | **54321 |
| ***4321 | 1234*** | 1234*****  | ***4321 |
| **54321 | 123**** | 12345***** | ****321 |
| *654321 | 12***** | 123456*    | *****21 |
| 7654321 | 1*****  | 1234567    | *****1  |

5)

```
int x = 1, y = 6;
while (y--){
    x++;
}
System.out.println("x = " + x + " y = " + y);
```

Which statement is true?

- a) x = 6 y = 0
- b) x = 7 y = 0
- c) x = 6 y = -1
- d) Compilation fails.

6) How many times will the following code print "Be careful"?

```
int count = 10;
while (count-- >= 10) {
    System.out.println("Be careful");
    count+=1;
}
```

- a) 8
- b) 9
- c) 10
- d) infinite loop

7) Given following class:

```
public class While {
    public void loop(){
        int x= 0;
        while ( 1 ){          /* Line 6 */
            System.out.print("x plus one is " + (x + 1)); //Line 8 */
        }
    }
}
```

Which statement is true?

- a) There is a syntax error on line 1.
- b) There are syntax errors on lines 1 and 6.
- c) There is a syntax error on line 6.
- d) There are syntax errors on lines 1, 6, and 8.

8) This code will not compile. What is wrong with it?

```
int a = 0, b = 0;
```

```

        for (int i = 0; i < 5; i++) {
            if (++a > 2 || ++b > 2) {
                a++;
            }
        }
        System.out.println("a=" + a + " b=" + b);
        System.out.println("Value of i after completion of loop:
" + i);

```

- a) loop counter `i` is not initialized
- b) **loop counter `i` should be declared before the loop**
- c) loop counter `i` is initialized to zero
- d) loop counter `i` is not updated inside the loop

9) Consider the following code segment:

```

public class MyClass{
    public MyClass(){/*code*/} // more code...
}

```

To create an object of type `MyClass`, you would write:

- a) **`MyClass mc = new MyClass();`**
- b) `MyClass mc = MyClass();`
- c) `MyClass mc = new MyClass;`
- d) It can't be done. The constructor of `MyClass` should be defined as:  

```

public void MyClass(){/*code*/}

```

10) Suppose you have the following class:

```

public class Point {
    int x, y;
    public Point(int x, int y) { this.x = x; this.y = y; }
    public Point() { this(10, 20); }
    public int getX() { return this.x; }
    public int getY() { return this.y; }}

```

What is the output of the following code, if any:

```

public class PointTest {
    public static void main(String args[]) {
        Point p = new Point();
        System.out.println(p.getX());}}

```

- a) 0
- b) **10**
- c) 20
- d) There is a compilation error.

**Question 2. (5 Marks)**

A) What is the output of the following program? (2 marks)

```
public class MyClass {
    private int a = 5;
    public void setA(int param){
        a = param;
    }
    public int getA(){
        return a;
    }
    public MyClass m1(){
        MyClass o = new MyClass();
        o.a = a + 2;
        return o;
    }
    public void m2(MyClass oParam){
        oParam.a = a + 1;
    }
    public void m3(MyClass oParam){
        oParam = new MyClass();
        oParam.a = a;
    }
}

public static void main(String[] args){
    MyClass o1 = new MyClass();
    o1.setA(10);
    MyClass o2 = o1.m1();
    MyClass o3 = new MyClass();
    o2.m3(o3);
    MyClass o4 = new MyClass();
    o1.m2(o4);
    System.out.println("o1.a = " + o1.getA() + ", o2.a = " +
o2.getA() + ", o3.a = " + o3.getA() + ", o4.a = " + o4.getA());
}

o1.a = 10, o2.a = 12, o3.a = 5, o4.a = 11
```

B) Suppose you have the following class: (3 marks)

```
class Q2 {
    private int a;
    private int b;
    public Q2() { a = 3; b = 5;}
    public Q2(int a, int b) { this.a = a; this.b = b;}
    public void setA(int a){this.a = a;}
    public void setB(int b){this.b = b;}
    public int getA(){return a;}
    public int getB(){return b;}

    public boolean m(int a, int B){
        b = ++B*10;
        this.a = a*3%15;
        return b > a;
    }
}
```

What is the output of main method in class TestQ2:

```
public class TestQ2 {
    public static void main(String args[]){

        Q2 obj1 = new Q2(5,10);
        Q2 obj2 = new Q2();

        System.out.println("obj1.a = " + obj1.getA());
        System.out.println("obj2.b = " + obj2.getB());

        obj2.setA(2); obj2.setB(15);

        System.out.println("obj2.a = " + obj2.getA());
        System.out.println("obj2.b = " + obj2.getB());

        for(int i = 1; i <= 3 ; i++)
        {
            if(i % 3 == 0 && obj1.m(20, i))
                obj1 = obj2;

            System.out.println("obj2.a = " + obj2.getA());
            System.out.println("obj1.b = " + obj1.getB());
        }
    }
}
```

**Solution:**

```
obj1.a = 5
obj2.b = 5
obj2.a = 2
obj2.b = 15
obj2.a = 2
obj1.b = 10
obj2.a = 2
obj1.b = 10
obj2.a = 2
obj1.b = 15
```

## Result

| Question No.   | Relevant Student Outcome | SO is Covered by % | Full Mark | Student Mark | Assessor's Feedback |  |  |
|--|--------------------------|--------------------|-----------|--------------|---------------------|--|--|
| 1  | a                        | 60                 | 6         |              |                     |  |  |
| 2  | i                        | 40                 | 4         |              |                     |  |  |
|  |                          |                    |           |              |                     |  |  |
|  |                          |                    |           |              |                     |  |  |
|  |                          |                    |           |              |                     |  |  |
| Totals   |                          | 100%               | 10        |              |                     |  |  |
|  |                          |                    |           |              |                     |  |  |
|  |                          |                    |           |              |                     |  |  |
| I certify that the work contained within this assignment is all my own work and referenced where required.<br><br>Student Signature: _____ Date: _____ |                          |                    |           |              |                     | Feedback Received:<br><br>Student Signature: _____ Date: _____ |  |