King Saud University

College of Computer and Information Sciences
Computer Science Department

Course Code:	CSC 111
Course Title:	Introduction to Programming
Semester:	Fall 2015
Exercises Cover Sheet:	**Mid 2 Exam - A**
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	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.	2,3	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;		

Important Notes:

- Cheating is prohibited! Looking at your colleague's paper will get you an F in the course immediately!

- Turn OFF your Phone/s. If you take out your phone for ANY reason, you will get an F in the course immediately!

ملاحظات هامة

- الغش ممنوع! عند النظر إلى ورقة زميلك، سترسب في المادة مباشرة!

أغلق جوالك / جوالاتك ! عند إخراجك للجوال لأي سبب كان، سترسب في المادة مباشرة

Question 1 (3 Marks)

Put your answer of the question 1 (**multiple choice questions**) in the following table. ***Note: Student is allowed 2 wrong choices with no penalty. After that, for each wrong choice he loses half a point***:

Question	Answer
1	
2	
3	
4	
5	
6	

1. (0.5 mark) What is the output of the following code segment, if any?

```
int result = 0;

for(int i = 0; i < 3; i++)
      for(int j = 3; j > 0; j--)
            result = result + i*j;

System.out.println(result);
```

A. 18 **B. 24** **C. 36**

D. There is a compilation error. **E. Infinite loop.**

2. (0.5 mark) Assume that you have the following class:

```
public class Test {
	public int number;
	public void writeOutput()
	{
		int number = 3;
		number = this.number - number * this.number;
		System.out.println(number);
	}
}
```

Now, assume that you defined an object of the class above and used it in your program, as such:

```
public class TestMain {
	public static void main(String[] args) {
		Test t1 = new Test();
		t1.number = 10;
		t1.writeOutput();
	}
}
```

What is the output of the program?

A. 3 **B. 10** **C. -6**

D. -20 **E. -90**

3. (0.5 mark) What is the output of this code fragment, if any?

```
int x = 10;
do{
	int y = x / 2;
	if(y + 10 > x)
		x = x + 10;
}while(x < 50)
System.out.println(" x = " + x);
```

A. x = 10 **B. x = 60** **C. x = 100**

D. There is a compilation error. **E. Infinite loop.**

4. (0.5 mark) What is the output of this code fragment, if any?

```
int n = 0;  /* Line 1*/

while(n < 3)  /* Line 3*/
{
	int m = 1;
	if((n - m) % 2 == 0) n+=1;m-=1;  /* Line 6*/
}
System.out.println("n=" + n + ",m=" + m);  /* Line 8*/
```

A. n=3,m=-4 **B. n=3,m=-3** **C. Infinite loop.**

D. There is a compilation error in line 6.

E. There is a compilation error in line 8.

5. (0.5 mark) Assume that you have the following class:

```
public class Test {
   public int i;
   public boolean b;
   public String st;
}
```

Now, assume that you defined an object of the class above and used it in your program, as such:

```
public class TestMain {
      public static void main(String args[]) {
            Test t = new Test();
            System.out.println("i=" + t.i);
            System.out.println("b=" + t.b);
            System.out.println("string=" + t.st);
      }
}
```

What is the output of the program?

A. There is a compilation error.

B. `i=0, b=false, string=null`

C. `i=0, b=0, string=0`

D. `i=none, b=none string=none`

E. There is a run time error.

6. (0.5 mark) You read the following statement in a Java program that compiles and executes.

```
customer.buy(intVariable);
```

What can you say for sure?

A. `intVariable` must be an `int`.

B. `buy` must be the name of an instance variable.

C. `buy` must be a method.

D. `customer` must be the name of a class.

E. `customer` must be a method.

Question 2 (2 marks)

Assuming that a year has 12 months and each month has exactly 30 days, complete the following two methods `increment()` and `decrement()` in class Date such that they increment/decrement the date by one day

note1: year, month and day cannot have a value of zero. If this happens, the object should return to its original state (i.e., you cancel or rollback the change to the date object).

note2: Each blank should have only *ONE java statement or expression*.

```
public class Date {
	private int day;
	private int month;
	private int year;
	public void increment(){
		day++;
		if( ..................... ){
			.....................
			month++;
			if(month>12){
				.....................
				.....................
			}
		}
	}
	public void decrement(){
		if(day!=1)
			day--;
		else{
			day = .....................
			if(  .....................)
				month--;
			else{
				.....................
				.....................
				if(year==0){
					.....................
					System.out.println("Error!!!");
				}
			}
		}
	}
}
```

Question 3 (5 Marks)

Given the following class answer the questions below:

```
class Q2 {
      private int a;
      private int b;
      private int c;
      public void setA(int a){this.a = a;}
      public void setB(int b){this.b = b;}
      public void setC(int c){this.c = c;}
      public int getA(){return a;}
      public int getB(){return b;}
      public int getC(){return c;}

      public int m1(int a, int b){
            for (int i = 0; i < 5; i++){
                  a++;
                  b++;
            }
            return a + b;
      }
      public boolean m2(int x, int y){
            a = x + 1;
            b = y / 2;
            return m1(a, b) + x + y - a - b < c;
      }
}
```

A- **(1 mark)** Suppose we run the code:

```
Q2 obj = new Q2();
obj.setA(1); obj.setB(2); obj.setC(3);
int x = obj.m1(1,1);
```

what will be the value of `x, obj.a, obj.b, obj.c`?

x: ..... obj.a: ..... obj.b: ..... obj.c: .....

B- **(1 mark)** Suppose we run the code:

```
Q2 obj = new Q2();
obj.setA(1); obj.setB(2); obj.setC(3);
boolean b = obj.m2(1,1);
```

what will be the value of `b, obj.a, obj.b, obj.c`?

b: ..... obj.a: ..... obj.b: ..... obj.c: .....

C- **(3 marks)** What is the output of the main method in the following class `TestQ2`?

```
public class TestQ2 {
	public static void main(String args[]){
		Q2 obj1 = new Q2();
		Q2 obj2 = new Q2();
		obj1.setA(0); obj1.setB(0); obj1.setC(10);
		obj2 = obj1;
		obj2.setA(4); obj2.setB(5); obj2.setC(-1);
		while(!obj1.m2(1, 3)){
			System.out.println("obj1.a = " + obj1.getA());
			System.out.println("obj1.b = " + obj1.getB());
			System.out.println("obj1.c = " + obj1.getC());
			obj2.setC(obj2.getC() + 10);
		}
		System.out.println("obj2.a = " + obj2.getA());
		System.out.println("obj2.b = " + obj2.getB());
		System.out.println("obj2.c = " + obj2.getC());
	}
}
```

Result

Question No.	Relevant Student Outcome	SO is Covered by %	Full Mark	Student Mark	Assessor's Feedback
1	a	30	3		
2	i	20	2		
3	i	50	5		
Totals		100%	10		

I certify that the work contained within this assignment is all my own work and referenced where required. **Student Signature:** **Date:**		**Feedback Received:** **Student Signature:** **Date:**