



King Saud University

College of Computer and Information Sciences

Computer Science Department

Course Code:	CSC 111
Course Title:	Introduction to Programming
Semester:	Spring 2011
Exercises Cover Sheet:	Mid 2 Exam

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;	3, 4	50
	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.		
	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 (4 Marks):

Find and explain the errors of the following program.

```
1. class A {
2.     public char c;
3.     private int n;
4.     public A(int p){n=p; c='a';}
5.     public int f(int p, char q){ n+=p; c=q; return n;}
6.     public boolean p(int i){return i>n;}
7. }
8.
9. class B {
10.     private char s;
11.     private int n;
12.     public void g(char p,int q){n=q; s=p; h(q,p);}
13.     private int h(int p,char q){n+=p; s=q; return n}
14. }
15.
16. class Main {
17.     public static void main(String args[]){
18.         A a1, a2;
19.         B b1, b2;
20.         int r;
21.         a1.c = 'x';
22.         a1 = new A();
23.         b1 = new B();
24.         a1.f('y',4);
25.         b1.h(4,'y');
26.         a2 = new A(4);
27.         a2.c = b1.s;
28.         r = b1.g('y',4);
29.         r = a1.f(4,'y');
30.         if (a1.p(r))
31.             a1 = a2;
32.         else if (a1.f(r,'y'))
33.             a1 = b1;
34.         else
35.             b2 = b1;
36.     }
37. }
```

Example :

```
Private int number; // P for private is capital letter
private int function(int z){s++; return s} // undefined s missing
```

Question 2 (4 Marks):

a- What is the display of the following code :

```
int i, j ;
for ( i = 2; i<4;i++) {
    j = 1;
    System.out.print(i+" | ");
    do {
        System.out.print("  "+ i * j);
        j+=2 ;
    } while (j<7);
    System.out.println();
}
```

b- Rewrite the code of question 2.a using only the **while** loop instead of the **for** and the **do-while** loops

Answer :

Question 3 (5 Marks):

Robot
-x : int -y : int -nbMoves : int
+Robot() +Robot(in xInitial : int, in yInitial : int) +moveUp() : void +moveDown() : void +moveLeft() : void +moveRight() : void +movedMoreThan(in rbt : Robot) : boolean +isCloserToTheOriginThan(in rbt : Robot) : boolean

Consider the class *Robot* with the following attributes:

x : represents the coordinate of the robot in the horizontal axis

y : represents the coordinate of the robot in the vertical axis

nbMoves : represents the total number of moves in both directions

The class *Robot* has the following methods:

The constructor ***Robot***() : initializes all attributes with the value 0 (zero)

The constructor ***Robot***(int, int) : initializes *x* and *y* with the given parameters *xInitial* and *yInitial* and initializes *nbMoves* with the value zero.

moveUp() : moves vertically one step forward

moveDown() : moves vertically one step backward

moveRight() : moves horizontally one step forward

moveLeft() : moves horizontally one step backward

movedMoreThan(*Robot*) : returns true if the current robot has more moves than *rbt*, otherwise it returns false

isCloserToTheOriginThan(*Robot*) : returns true if the current robot is closer to the origine than *rbt*, otherwise it returns false

Implement the class *Robot*.

Answer :

Question 4 (3 Marks):

Write a Java Program that creates a Robot at the position (10, 400) and moves it to the position (500, 20)

Answer :

Result					
Question No.	Relevant Student Outcome	SO is Covered by %	Full Mark	Student Mark	Assessor's Feedback
1	a	25	4		
2	a	25	4		
3	c	33	5		
4	c	17	3		
Totals		100%	15 +1		
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: