

***Student Department:***

***Student Name:***

***Student ID:***

***Marks:***

<b><i>Q1</i></b>	<b><i>Q2</i></b>	<b><i>Q3</i></b>	<b><i>Total(10)</i></b>

**Question1****[6Marks]**

i. In the domain of people, consider the following sentences:

1. Mona is a Professor
2. Mohamed is the Dean.
3. Deans are professors.
4. All professors consider the dean a friend or don't know him.
5. Everyone is a friend of someone.
6. People only criticize people that are not their friends.
7. Mona criticized Mohamed.

a) Translate these sentences into Predicate Logic.

**(2 mark)**

b) Transform the above Predicate Logic sentences to CNF.

**(1 mark)**

	Predicate Logic	CNF
1		
2		
3		
4		
5		
6		
7		

c) Prove by resolution, the following statement:

**(1 mark)**

Mona is not friend of Mohamed

d) Prove, by using contradiction, the following statement:

**(1 mark)**

Mona is not friend of Mohamed.

ii. ) Prove that  $(P \vee Q) \wedge (R \vee P) \wedge (\neg Q \vee \neg R \vee P) \equiv P$

**(1 mark)**

### Question2

Given the following prolog program:

a) What would Prolog reply when presented with the following query.

?- result([a, b, c, d, e, f], X).

**(1 mark)**

```
result([_, E | L], [E | M]) :- !,  
    result(L, M).  
result(_, []).
```

b) Consider the following program which is intended to define the third argument to be the maximum of the first two numeric arguments. Change the program so that it works correctly

**(1 mark)**

```
max(X, Y, X) :- X >= Y, !.  
max(X, Y, X).
```

### Question3

[2 Marks]

Consider the following frame system which presents employment hierarchy within a company that applies the following rules:

- 1- Temporary employee deserves salary = 100 L.E /working day
- 2- Sales Employee deserves salary = 200 L.E /sale items
- 3- A manager deserves salary = 10000 L.E
- 4- Temporary consultant deserves salary = 200 L.E /working day

Mohamed works as a sales director and Ahmed works as a sales director

- I. Give the class precedence list for Mohamed and Ahmed (1 mark)
- II. Identify whether Mohamed take more salary than Ahmed provided that the number of sales items are 100 and Ahmed works for 15 days this month. (1 mark)

