Name (Arabic):_____ **Class:** _____

FCIS – Ain Shams University
Subject: CSW150– Structured Programming
Exam: (Midterm) 21/3/2018
Year: (Spring term) 1st Year undergraduate

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Instructor: Dr.Sally S.Ismail
Offering Dept.: SW Engineering Program
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Duration: 45 mints

Answer the following 3 questions: **(Total marks: 15)**

QUESTION (1) True/False. An explanation is required for false answers.	**(3 points)**	**5-mints**	**Grade**

(a) The statement
`struct my_struct`
`{ int num1, num2;`
`};`
`my_struct x;`
allocates 8 bytes in memory. **(T)**
			1

Answer: NO EXPLANATION REQUIRED			
(b) It is the compiler's task to detect syntax errors for your program. **(T)**			**1**
Answer: NO EXPLANATION REQUIRED			

(c) The output of the following code scrap is **6.** **(F)**
`int my2DArr[2][]= {{1,2,3},{4,5,6}};`
`cout<<my2DArr[1][2];`
			0.5

Answer: ➔ **Syntax error (we should define at least 2nd dimension size)** **or** ➔ `int my2DArr[2][3]= {{1,2,3},{4,5,6}};` **or** ➔ `int my2DArr[][3]= {{1,2,3},{4,5,6}};`			**0.5**
QUESTION (2) Built-in Functions	**(3 points)**	**10-mints**	
Write in the required code lines			
In order to solve a 2nd degree equation using mathematical built-in functions, you need to add 3 lines of codes to your program: $X_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ **Note 1:** Assume that a,b,c are declared as int variables and input by the user with correct values. **Note 2:** Use the following functions found in *math.h* file	**(1) #include <math.h>** **or ➔#include "math.h"** **(2) double x1=(-b+sqrt(pow(b,2)-4*a*c))/2*a** **(3)double x2=(-b-sqrt(pow(b,2)-4*a*c))/2*a**		**1** **1** **1**

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• `float pow (float , int)` • `float sqrt (float)`	**(1) #include <math> → 0.5** **#include<cmath> →0.5** **(2) Missing * or any partial mistake in the equation →0.5** **(3) Missing * or any partial mistake in the equation →0.5**	

QUESTION (3) Code Development	**(9 points)**	**20-mints**	

Write a program that takes the details of **5** candies **(name , price , calories) in an array of structs**. Then asks the user how many calories he wants to consume. Depending on the user's answer, the program should print a list of all candies (name, price) that has calories equal to the user's answer.

Hint: Assume the candy name consists of only 1 word with 15 characters.

Sample Run:

```
C:\Windows\system32\cmd.exe
Enter The Candy details (name, price, calories) :
Number 1: lollipop 15 100
Number 2: chocolate 25 200
Number 3: chips 5 50
Number 4: biscuit 3 40
Number 5: pepsi 10 200
 Enter how many calories you want to consume 200
chocolate 25
pepsi 10
Press any key to continue . . .
```

Answer:

Main source file

```
#include <iostream>
using namespace std;
struct Candy
{
Char name[15];
float price;
int calories;
};
void main ()
{
Candy candyArray [5];
                int numOfCalories , indexOfbestPrice ;
cout<<"Enter The Candy details (name, price,
calories) :"<<endl;
for(int i =0;i<5;i++)
{
cout<<"Number "<<i+1<<": ";
cin>>candyArray[i].name >>
candyArray[i].price >> candyArray[i].calories ;
}
cout<<" Enter how many calories you want to
consume ";
cin>>numOfCalories;
for (int i=0; i<5;i++)
{

if(candyArray[i].calories==numOfCalories)
{
cout<<candyArray[i].name<<"
"<<candyArray[i].price<<endl;
}
}

                                                    }
```

- **Program outline (#,main) →(1)**
- **User Friendly output msgs (at least one)→ (1)**
- **Struct definition→(2)**
- **Array declaration + professional names → (1)**
- **Input candy info +calories →(1)**
- **Search loop →(2)**
- **Output →(1)**

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Best Wishes ☺

Dr.Sally S.Ismail