CONFIDENTIAL

UNIVERSITI TEKNOLOGI MALAYSIA
FACULTY OF COMPUTING

SKILL-BASED TEST 1

SEMESTER II 2017/2018

SUBJECT CODE	**: SCSJ1023**
SUBJECT NAME	**: PROGRAMMING TECHNIQUE II**
YEAR/COURSE	**: 1 (SCSB/SCSJ /SCSP/SCSR / SCSV)** **2 (SCSR/SCSV)**
TIME	**: 5 p.m. – 6.15 p.m. (1 Hour 15 Minutes)**
DATE	**: 11 MARCH 2018**
VENUE	**: MPK1-10, CGMTL, CASE, N28, FC**

INSTRUCTIONS TO THE STUDENTS:

- This test consists of only **ONE** question.
- This is a **CLOSED-BOOK** test. References to any resources by any means are strictly prohibited.
- You are given **ONE HOUR FIFTEEN MINUTES** to complete the test inclusive the submission of your program.

MATERIAL FOR THE TEST:

- Students are provided with a source code file named **`sbt1.cpp`**.
- Students should use **`sbt1.cpp`** as a foundation to answer this test.

SUBMISSION PROCEDURE:

- Only the source code is required for the submission.
- Submit the source code file (i.e., sbt1.cpp) via the **UTM's e-learning system**.

Problem [50 Marks]

Consider a class named **`Date`** representing the data of a date which consists of the following attributes: the **description** of the date which is of type string, **day**, **month**, and **year** which are of type integer.

Write a C++ code by completing the source code in a file named **`sbt1.cpp`**, according to the following tasks:

1. Define the class **`Date`** which consists of
   a. all the attributes mentioned above. (2 marks)
   b. a constructor(s). (6 marks)
   c. an accessor for each attribute except the description. (6 marks)
   d. an overloaded minus (-) operator. This operator calculates the difference between two dates and returns the result in terms of a **`Date`** object. ***Note:*** The difference is calculated by subtracting each attribute (i.e., **`day`**, **`month`** and **`year`**), accordingly. All values must be positive. Below is an example of the calculation.

object	Day	month	year
date1	5	3	2018
date2	23	11	1999
date1 – date2	**18**	**8**	**19**

(6 marks)

   e. an overloaded input (>>) operator to read the values for **`day`**, **`month`**, and **`year`** of the date from the keyboard. The header of the operator has been given. Complete the definition of the operator. (3 marks)

   f. an overloaded output (<<) operator to display the date in the following format. The header of the operator has been given. Complete the definition of the operator.

   Format: `description: day-month-year` (4 marks)

2. Complete the definition of function **`displayDiff`**. This function is meant to display the difference between two dates, in which the difference is given as a **`Date`** object. The function at first checks the attribute **`year`**. If it has a non-zero value, the difference will be printed in terms of number of years. Otherwise, the function needs to check if the attribute **`month`** has a non-zero value. If so, the difference will be printed in terms of number of months, otherwise it will be in terms of number of days. (5 marks)

3. Create an array to hold three (3) dates and initialize only their description with the following values: “SBT”, “Test”, and “Final”, respectively. (4 marks)

4. Using a loop and an appropriate operator, write the code that allows the user to enter the values of the day, month and year from the keyboard for each of the dates held in the array created in Task 3. (3 marks)

5. Create two other **`Date`** objects named **`date1`** and **`date2`**, with the following data, respectively:

Object	**`date1`**	**`date2`**
Description	TODAY	Date of birth
Day	5	23
Month	3	11
Year	2018	1999

(4 marks)

6. Using an appropriate operator and another loop, print the data of all the dates along with their difference to the object **`date1`**. (7 marks)

Figure 1 shows a sample screen output that your program should produce. Note that, **bold** texts indicate keyboard input entered by the user.

```
Enter your date (day, month, year): 11 3 2018
Enter your date (day, month, year): 30 3 2018
Enter your date (day, month, year): 5 6 2018

TODAY: 5-3-2018

Date of birth: 23-11-1999
The difference: 19 year(s)

SBT: 11-3-2018
The difference: 6 day(s)

Test: 30-3-2018
The difference: 25 day(s)

Final: 5-6-2018
The difference: 3 month(s)
```

Figure 1: Example run of program