UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2013/2014

COURSE NAME	:	COMPUTER PROGRAMMING
COURSE CODE	:	BFC 20802
PROGRAMME	:	2 BFF/3 BFF
EXAMINATION DATE	:	JUNE 2014
DURATION	:	2 HOURS
INSTRUCTION	:	A) ANSWER **ALL** QUESTIONS FROM SECTION A AND SECTION B
		B) CHOOSE ONLY **TWO (2)** QUESTION FROM SECTION C
		C) ANSWER **ALL** QUESTIONS IN THE ANSWER BOOKLET PROVIDED

THIS QUESTION SET CONSISTS OF **FOURTEEN (14)** PAGES

SECTION A

Instruction: Please answer **T (True)** or **F (False)**.

No.	Questions	Answer	
		True	**False**
1	`iostream` is a standard C++ header file and contains definitions for input and output, such as `cin` and `cout`.		

2	This program can be compiled and run without errors.
	 ```char option;```
	```cin>>option;```
	```switch (option)```
	```{```
	``` case 'a': cout << "good bye!";```
	``` break;```
	``` case 'b': cout << "sayonara!";```
	``` break;```
	``` else: cout << "thank you!";```
	``` break;```
	```}```		

3	The global variables have to be declared inside the main function.		

4	This code will produce **053** as an output.
	 ```int x = 3;```
	```int y = 17;```
	```cout << x/y << y/x << y%x;```		

5	`float fFloatingNumber[10.2]` is a valid array statements.		
6	The extension name of a C++ source code file is `.cpp`		
7	Every C++ statement must end with semicolon.		
8	Mistakes that cause a running program to produce incorrect results are called logic error.		

9	This code will produce **44** as an output.
	 ```int value[20]={0,11,22,33,44,55,66,77,88,99};```
	```cout<<value[5];```		

10	C++ contains three different loop structures: the *while* loop, the *do...while* loop and *for* loop.		

(10 marks)

SECTION B

Instruction: Answer **ALL** questions.

Q1   Based on code snippet below, give the output for all questions:

```
char character[30]={'a', 'b', 'c', 'd', 'e', 'f', 'g', '\0'};
double num[30]={2.01, 3.01, 4.01, 5.01, 6.01, 7.01, 8.01, 9.01};
int value[30]={1,2,3,4,5,6,7,7,88,9,99};
char stmt[30]="universiti";
```

(a)   *character[4];*

(1 mark)

(b)   *num[0];*

(1 mark)

(c)   *num[5]+num[5-1];*

(1 mark)

(d)   *value[1];*

(1 mark)

(e)   *stmt[5];*

(1 mark)

Q2   Given the following C++ program:

```
#include <iostream>
using namespace std;
int main()
{
    int i = 8;
    while(i < 16)
        if((i++) % 2 == 0)
            cout << i << endl;
    return 0;    }
```

(a)   Rewrite the above code segment by using *do...while* statement.

(2 marks)

(b) What is the output of the above code segment?

(2 marks)

(c) How many times the loop repeats?

(1 mark)

Q3 Given the following C++ program:

```
1.      //Program 1
2.      #include <iostream>
3.      // _____
4.      using namespace std;

5.      int main()
6.      {
7.      cout <<"\n1. sqrt(9) is "<< sqrt(9);
8.      cout <<"\n2. pow(2,3) is "<< pow(2,3);
9.      cout <<"\n3. floor(2.3) is "<< floor(2.3);
10.     cout <<"\n4. ceil(2.3) is "<< ceil(2.3);

11.     getch();
12.     return 0;
13.     }
```

Program 1

(a) Write down an appropriate preprocessor directive in line 3.

(1 mark)

(b) Trace the output of each math functions in the Program 1.

(4 marks)

Q4   Given the following C++ program:

```
//Program 2
#include <iostream>
            (i)
void displayMax(int, int);
using namespace std;
int main()
{
    int iNumber1, iNumber2;
    iNumber1 = getNumber();
          (ii)        = getNumber();
    displayMax(iNumber1, iNumber2);
    system("PAUSE");
    return 0;
}
int getNumber( )
{
    int iNumber;
    cout << "Please enter number: ";
    cin >> iNumber;
    return iNumber;
}
void displayMax(int m, int n)
{
    if (      (iii)      )
        cout << m << " is greater than " << n;
    else if (m = n)
        cout << m << " is equal to " << n;
    else if (m < n)
        cout << m << " is smaller than " <<  (iv) ;
    else
        cout << "Error input";
}
```

Program 2

(a)   Fill in the blanks in Program 2 with correct statements.

(4 marks)

(b)   What is the output if *iNumber1 = 83* and *iNumber2 = 25*?

(1 marks)

Q5 Given, $a = 90$, $b = 8$, $c = 25$ and $d = 7$.

(a) Evaluate the following logical expression:
$$(93 + (++b) - 45/9) <= (35 - a\%45) \,||\, !((3*(d--)) > (10 + c\%3))$$

(3 marks)

(b) Write the expression of C++ statement which is equivalent with the following mathematical expression and what is the value of h?

$$h = \frac{83a + 2b^4}{\sqrt{c} - 4}$$

(2 marks)

Q6 Given the following C++ program:

```cpp
#include <iostream>
using namespace std;

int main()
{
    for (int iLoop=1; iLoop<=100; iLoop*=3)
        cout << iLoop << endl;

    system("PAUSE");
    return 0;
}
```

Program 3

What is the output of the following Program 3?

(5 marks)

Q7 Convert this *do..while* loop to *for* and *while* loop that prints out the odd numbers 1 through 99, separated by a blank space.

```cpp
int x = 1;
    do {
        cout << x << "     ";
        x = x+2;
    }
    while (x <= 99);
```

(5 marks)

6

Q8 Given the following C++ program:

```cpp
#include <iostream>
using namespace std;

int main()
{
    int number, total=0;
    cout << "Enter a number from 1 to 9: ";
    cin >> number;

    switch(number)
    {
        number++;
        case 1: ++number;
                cout<<total;
                break;
        case 2: total=2;
                cout<<total;
                ++number;
        case 4: total+=4;
                cout<<total;
                break;
        case 8: total-=3;
                cout<<total;
                number--;
                break;
        default: total*=2;
                 cout<<total;
    }
    cout<<endl;
    system("PAUSE");
    return 0;
}
```

Program 4

(a)   What is the output if *number=1*?

(1 mark)

(b)   What is the output if *number=2*?

(1 mark)

(c)   What is the output if *number=4*?

(1 mark)

(d)   What is the output if *number=8*?

(1 mark)

(e)   What is the output if *number=3.5*?

(1 mark)

7

Q9   Write assignment statements that perform the following operations with variable x, y, z.

   (a)   Adds 3 to variable x and stores the result in y.

(1 mark)

   (b)   Multiplies y with 5 and stores the results in y.

(1 mark)

   (c)   Divides x by 3.142 and stores the results in y.

(1 mark)

   (d)   Stores the value 30 in z.

(1 mark)

   (e)   Subtracts 4 from y and stores the results in x.

(1 mark)

Q10   Given the following C++ program:

```
#include <iostream>
using namespaces std;
int main()
{
    int a = 83, b = 32, c = 5;
    float d = 6.00;
    a *=  c + 45 - 20 % 7;
    cout << a << endl;
    b %= d - 3 * c;
    cout >> b;
    return 0;
}
```

   (a)   Find and circle **THREE (3)** errors in the above program and write down all the syntax error.

(3 marks)

   (b)   What is the output of the above code segment?

(2 marks)

SECTION C

Instruction: Answer **TWO (2)** questions only.

Q1   Draw flowchart and write a complete C++ program to identify the grade for subject BFC 20802 (Computer Programming) based on the assessments as listed in Table **1** while Table **2** is the input from the user. The final mark for this subject will be calculated based on the **SIX (6)** assessments input marks. Based on this final mark, the program will display a grade. The grade scales are as tabulated in Table **3**. Your program based on the functions in Table **4**.
Example of Output: refer to Figure **Q1**.

(20 marks)

Q2   Draw a flowchart and write a full C++ program that asks the user how many integer-valued numbers she wants to input, reads the integers one at a time with an appropriate prompt, and then outputs the average. An example output is shown in Figure **Q2**, where the user chose to enter **FOUR (4)** numbers.
(Hint: use function *void calculate_average*)

(20 marks)

Q3   Table **5** is the indicator to determine the range of CGPA while Table **6** is the input from the user. You are required to develop a program to calculate the CGPA based on CPA entered for **TWO (2)** semesters. Create a flowchart and write C++ program based on the functions in Table **7**:
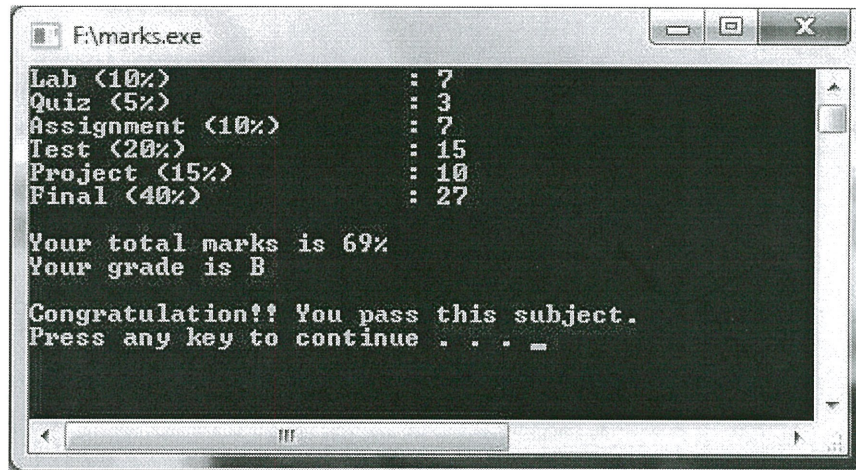Example of Output: refer to Figure **Q3**.

(20 marks)

Q4 Create a C++ program that will reads in **THREE (3)** integers from keyboard, calculate the average and display the average. Draw a flowchart where you need to invent:

(a) 3 prototype function: *int getInteger(void), float calcAverage(int a, int b, int c)* and *void dispAverage(float avg)*

(b) *main()* function that needed to ask an input of three numbers from user.

(c) After that, call the *getInteger()* function which accept 3 integer numbers and calculate the average using *calcAverage(val1, val2, val3)* function. Then, print the average value by using the *dispAverage(float avg)* function.

(20 marks)

- END OF QUESTIONS -

```
F:\marks.exe
Lab (10%)                    : 7
Quiz (5%)                    : 3
Assignment (10%)             : 7
Test (20%)                   : 15
Project (15%)                : 10
Final (40%)                  : 27

Your total marks is 69%
Your grade is B

Congratulation!! You pass this subject.
Press any key to continue . . .
```
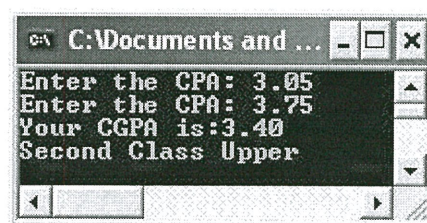
FIGURE Q1

```
How many numbers? 4
Enter number 1: 5
Enter number 2: 10
Enter number 3: 2
Enter number 4: 13
The average is 7.5
```

FIGURE Q2

```
C:\Documents and ...
Enter the CPA: 3.05
Enter the CPA: 3.75
Your CGPA is:3.40
Second Class Upper
```

FIGURE Q3

FINAL EXAMINATION

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TABLE 1

Assessments	Percentage (%)
Lab	10
Quiz	5
Assignment	10
Test	20
Project	15
Final	40
Total	**100**

TABLE 2

Assessments	Marks
Lab	7
Quiz	3
Assignment	7
Test	15
Project	10
Final	27

TABLE 3

Grade	Percentage (%)
A+	85 - 100
A	80 - 84
A-	75 - 79
B+	70 - 74
B	65 - 69
B-	60 - 64
C+	55 - 59
C	50 - 54
C-	45 - 49
D	40 - 44
E	39 - 0

TABLE 4

Function Prototype	Function Header
float getMarks();	Ask user to enter marks as shown in Table **2**.
float calculateTotalMark(float, float, float, float, float, float)	Calculate the total marks.
void displayGrade(float);	Display a grade based on the total marks.
void displayMessage(float);	Display a message based on grade. If mark greater or equal to 40, it will display a message, "Congratulation!! You pass this subject." Otherwise, it will display a message, "Try harder next semester."
int main();	Main function to run the program

TABLE 5

CPA	Class
2.00<=CPA<2.50	Third Class
2.50<=CPA<3.00	Second Class Lower
3.00<=CPA<3.75	Second Class Upper
3.75<=CPA<=4.00	First Class

TABLE 6

SEMESTER	CPA
1	3.05
2	3.75

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TABLE 7

Function Prototype	Function Header
void display_CGPA (float);	Display the CGPA
float get_CPA(void);	Ask user to enter CPA as shown in Table **6**
float calculate_CGPA(float, float);	Calculate the CGPA for 2 semesters
float getGrade(float score);	Retrieve the class for each calculated CGPA
int main();	Main function to run the program