UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
SEPTEMBER 2014 SESSION

SUBJECT CODE	:	**FSB23003**
SUBJECT TITLE	:	**PROGRAMMING FUNDAMENTAL**
LEVEL	:	**BACHELOR**
TIME / DURATION	:	**9.00 AM – 12.00 PM** **(3 HOURS)**
DATE	:	**10 JANUARY 2015**

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.

2. This question paper is printed on both sides of the paper.

3. Please write your answers on the answer booklet provided.

4. Answer should be written in blue or black ink except for sketching, graphic and illustration.

5. This question paper consists of TWO (2) sections. Section A and B. Answer all questions in Section A. For Section B, answer two (2) questions only.

6. Answer all questions in English.

THERE ARE 9 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

Question 1

(a)   Define the computer hardware.

(3 marks)

(b)   Name two (2) high level programming languages.

(2 marks)

(c)   Describe the two (2) different types numbering system.

(5 marks)

(d)   Given a C program in Figure 1 below:

```c
1     #include <stdio.h>
2
3     int main()
4   - {
5         int tab[10], P, S, i;
6         float Q;
7
8         for (i = 0;i < 5;i++)
9   -     {
10            printf("\n Enter value no %d : ", i);
11            scanf("%d", &tab[i]);
12        }
13
14        P = 1;
15        S = 0;
16
17        for (i = 0;i < 5;i++)
18  -     {
19            S = S + tab[i];
20            if (P != 0) P = P * tab[i];
21        }
22
23        Q = S / 5;
24
25        printf("\n The value of P is : %d\n", P);
26        printf("\n The value of Q is : %d\n", Q);
27        printf("\n The value of S is : %d\n", S);
28
29        return 0;
30    }
```

Figure 1: C Program

    i.   List all the types of data used in this program.

(2 marks)

    ii.   Briefly explain why Q has been declared as float in *line 6*.

(2 marks)

    iii.   If the user enters 10 for every data, what would be the value of P, Q, and S?

(3 marks)

    iv.   Explain the purpose of variable P in this program and why it has been initialized to one (1) and not zero (0).

(3 marks)

Question 2

(a)   Name and draw five (5) symbols used in flow chart.

(5 marks)

(b)   Write a single C statement corresponding to each of the following tasks:

    i.   Declare the variables *a* and *b* of type integer.

(1 mark)

    ii.   Assign *150.13* to the variable *c*.

(1 mark)

    iii.   Compute an area of a square as *s* using height as *h* and length as *l*. Given the formula of square is *height x length*.

(1 mark)

    iv.   Add *10* to the variable *total* by using the *+=* operator

(1 mark)

    v.   How many elements do array *zArray* has in this statement:

          int zArray[8] = {2,4,6,8,10};

(1 mark)

(c)   Figure 2 shows the flowchart that allows the user to pick the largest of an arbitrary set of numbers (3 numbers). Convert the flowchart below to C programming code.
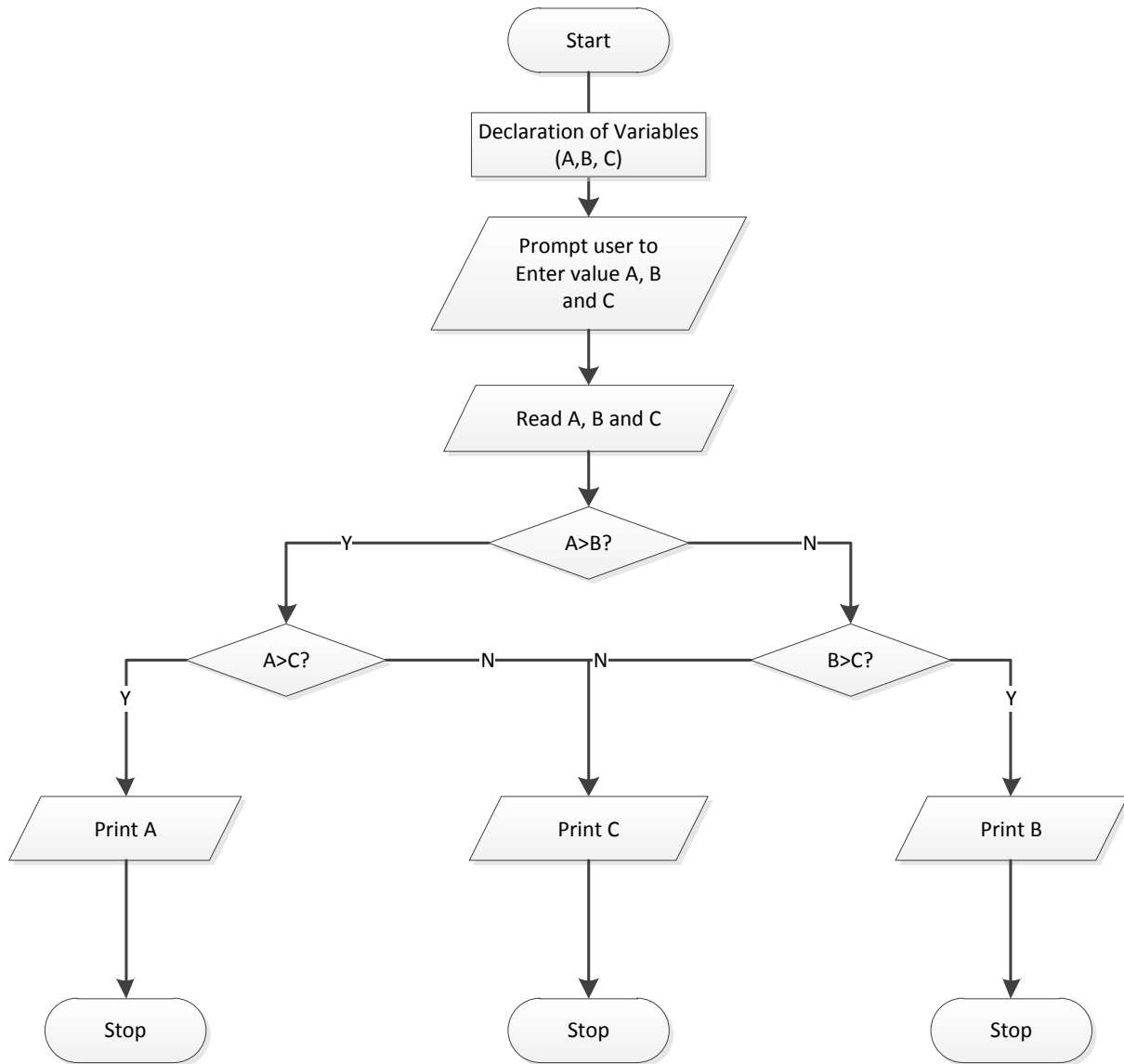

Figure 2: Flowchart of the unit conversion (U.S unit to SI unit)

(10 marks)

SECTION B (Total: 60 marks)

INSTRUCTION: Answer TWO (2) questions only.
Please use the answer booklet provided.

Question 3

(a)   Write a complete C program with two functions named *Circle* and *Rectangle* to calculate the area of circle and rectangle. Both functions will only return the area of circle and rectangle respectively to the main function. All input data are read in the main function. The program should have the following funtionalities:

i.   Prompt the user to select the option : **1 – Circle, 2 – Rectangle**

ii.   Input the *length* and *width* for rectangle or *radius* for circle.

The formulas of area are given are as below:

Area for circle   :   3.14159 * radius * radius

Area for rectangle   :   Length * Width

The expected output is as shown in Figure 3.

```
Program to calculate area
1 - Circle
2 - Rectangle

What option = ? 2

Length = ? 4
Width  = ? 3

Area = 12
```
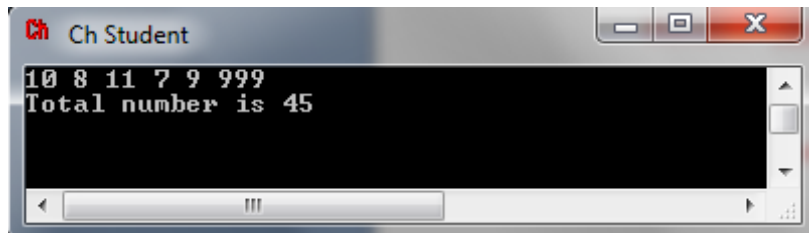
Figure 3: Expected output

(20 marks)

(b)   Write a complete C program that calculates and prints the total of several integers. Assume that the last value reads with *scanf()* is sentinel number 999. A typical input sequence might be as shown in Figure 4.

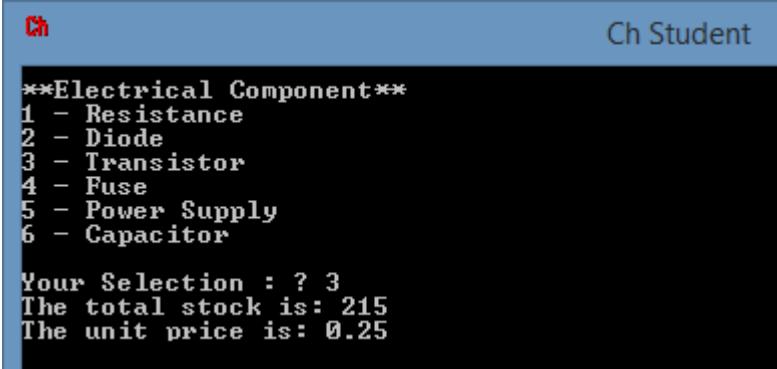Figure 4: Expected input and output

(10 marks)

Question 4

(a)   The stock and price of electrical components is given as in Table 1.

Table 1: The stock and cost of electrical components

Component	Stock	Price per unit
Resistance	100	0.40
Diode	200	0.50
Transistor	215	0.25
Fuse	50	0.15
Power Supply	25	20.00
Capacitor	250	0.55

Using the data in Table 1, construct a complete C program with two functions named *stock(component_type)* and *price(component_type)* that return the stock and price values of the selected electrical component.

The expected output is as shown in Figure 5.

Figure 5: Expected output

(20 marks)

(b)   A school conducts a 100 marks exam for its students and grades them as shown in Table 2. Write a C program that reads marks entered by the user, calculates the grades for student by using *if...else* statement and display their grade.

Table 2: Students grading

GRADE	MARKS
A	≥ 80
B	60 – 79
C	50 – 59
D	40 – 49
F	0 – 39
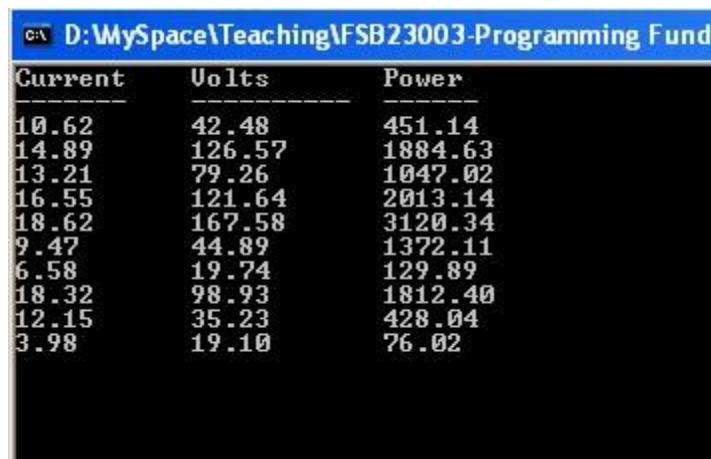
(10 marks)

Question 5

(a)   Write a complete C program that declares three one-dimensional arrays named *power*, *current*, and *volts*. Each array should be declared in *main()* and be capable of holding 10 double-precision numbers.

      i.   The numbers to store in *current* are 10.62, 14.89, 13.21, 16.55, 18.62, 9.47, 6.58, 18.32, 12.15, and 3.98.

      ii.   The numbers to store in *volts* are 42.48, 126.57, 79.26, 121.64, 167.58, 144.89, 19.74, 98.93, 35.23, and 19.10.

Your program should pass these three arrays to a function named *calc_power()*, which should calculate elements in the *power* array as the product of the corresponding elements in the *current* and *volts* array (for example, power[1] = current[1] * volts[1]). After *calc_power()* has passed values to the *power* array, the values in the array should be displayed from inside *main()*.
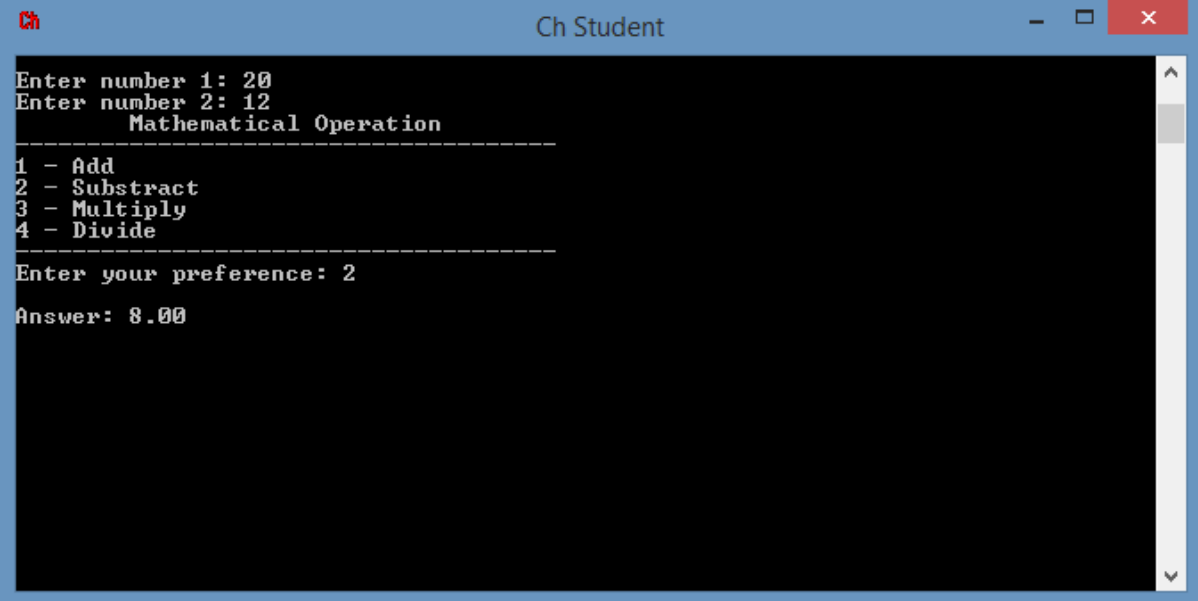
The expected output is as shown in Figure 6.

Figure 6: Expected output.

(20 marks)

(b)   Using *switch* statement, develop a simple calculator to accept two floating point numbers from the keyboard. Then display a menu to the user and let him/her select a mathematical operation to be performed on those two numbers. Then display the answer. A sample run of your program should be similar to the following:

Figure 7: Sample output

(10 marks)

END OF QUESTIONS