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**CONFIDENTIAL**

**SET A**

# UNIVERSITI KUALA LUMPUR
## Malaysia France Institute

## FINAL EXAMINATION

## JANUARY 2014 SESSION

| | | |
|---|---|---|
| **SUBJECT CODE** | : | **FSB 23003** |
| **SUBJECT TITLE** | : | **PROGRAMMING FUNDAMENTAL** |
| **LEVEL** | : | **BACHELOR** |
| **TIME / DURATION** | : | **x.xx pm – x.xx pm ( 3 HOURS )** |
| **DATE** | : | |

### 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 8 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 software.

(2 marks)

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

(2 marks)

(c) Describe the three (3) different types of data.

(6 marks)

(d) Give the output of the following expressions.

(i).

```
float a=100 , b;
b = a*a;
printf ("a=%f\n", a);
```

(1 mark)

(ii).

```
int a = 0x20 , b = 02;
a -= b;
printf ("a=%d, b=%d\n", a, b);
```

(2 marks)

(iii).

```
int i = 0, sum =0;
while (i <= 3) {
sum += i;
printf ("sum [%d] = %d\n", i, sum );
i++;
}
```

(2 marks)

(e) The following loop is an endless loop: when executed it will never terminate. Rewrite the `while` loop so that it can produce the desired output as followed:

```
This program will print out integer number from 1 to 10.
1 2 3 4 5 6 7 8 9 10
```

Figure 1: The desired output

```
printf("This program will print out integer number ");
printf("from 1 to 10.\n");
int number = 1;
while (number <= 10)
      printf("%d", number);
```

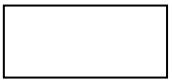
(2 marks)

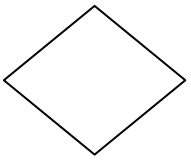
(f) Explain the difference between the constants 7, '7', and "7".

(3 marks)

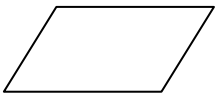
**QUESTION 2**

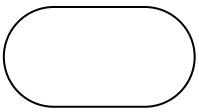
(a) Name the following flow chart basic symbols and describe the purpose of each symbols:

i. 

ii. 

iii. 

iv. 

v. 

(10 marks)

(b) Figure 2 shows the flowchart that allows the user to convert from U.S. customary system units to the International System of metric units (SI). Convert the flowchart below to C programming code.

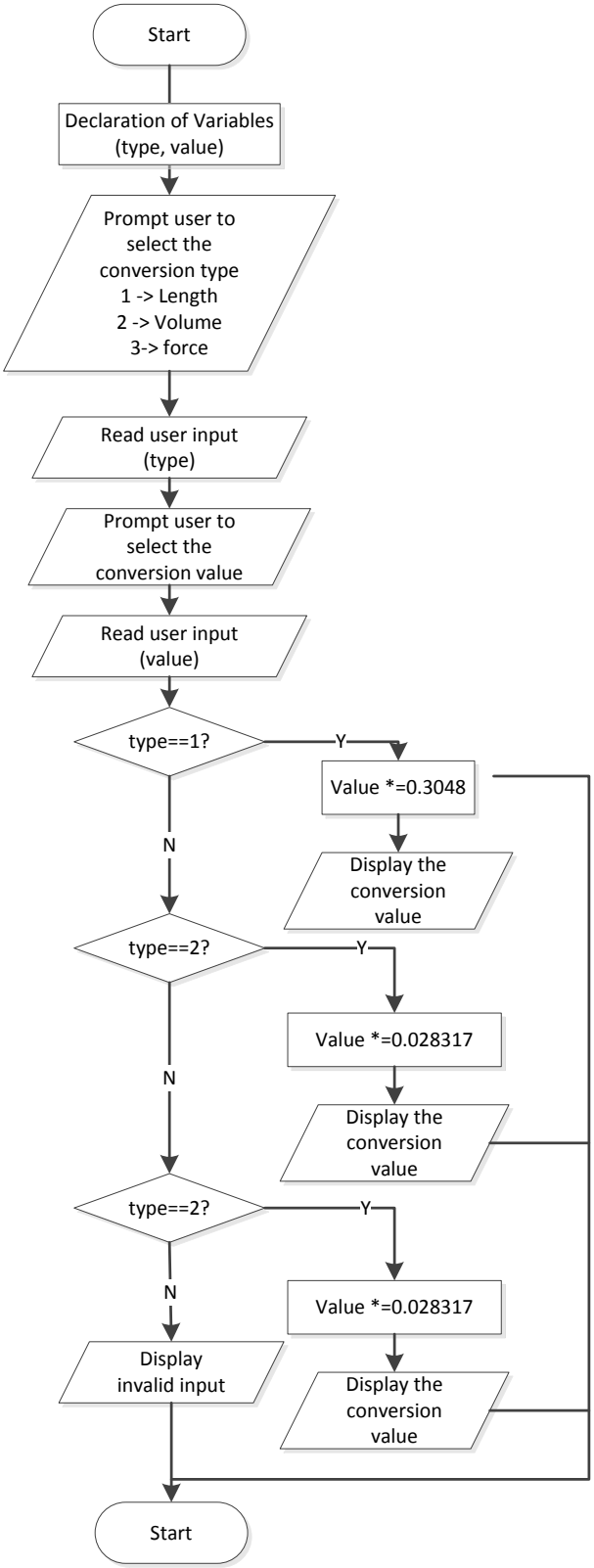



Figure 2: Flowchart of the unit conversion (U.S unit to SI unit)

(10 marks)

## SECTION B (Total: 60 marks)

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

**Please use the answer booklet provided.**

## QUESTION 3

(a) The stock and price of bulbs of various brands is given as in Table 1.

Table 1: The stock and cost of bulbs

| Brand | Stock | Price per unit |
|---|---|---|
| Philips | 25 | 10.20 |
| Osram | 15 | 11.25 |
| GEC | 30 | 12.99 |

Using the data in Table 1, construct a complete C program with two functions named `stock()` and `price()` that return the stock and price values of the selected brand of bulb. The type of brand should be input to both functions as a character type.

The expected output is as shown in Figure 3.

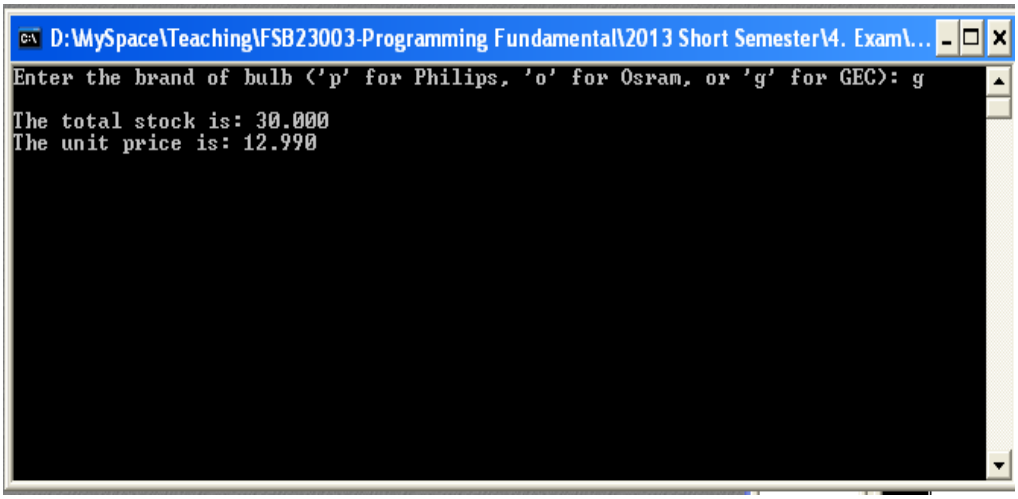



Figure 3: Expected output

(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 4

(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 4.

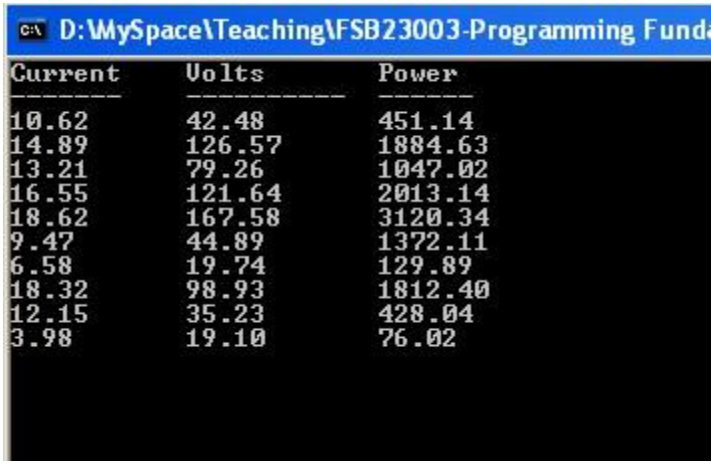



Figure 4: Expected output.

(20 marks)

(b) Using *switch* statement, write a C program that reads a positive single-digit integer number between 1 – 7 and prints the corresponding day of the week (1 is Monday). For example, if the user enters 2, the program should print the word "*Tuesday*" to the screen. Please include proper input validation.

(10 marks)

## QUESTION 5

(a) Fluid flowing in a pipe flows in a smooth pattern, known as laminar flow, or a turbulent pattern, known as turbulent flow. The velocity, $V$, that produces each type of flow in the pipe can be determined by using these formulas:

$V_{laminar}$ = (2100$mu$) / ($p$$d$)

$V_{turbulent}$ = (4000$mu$) / ($p$$d$)

$V_{laminar}$ is the velocity of the fluid in ft/sec that produces a definite laminar flow.

$V_{turbulent}$ is the velocity of the fluid in ft/sec that produces a definite turbulent flow.

$mu$ is the fluid's viscosity in lbf-sec/ft$^2$.

$p$ is the fluid's density in slug/ft$^3$.

$d$ is the pipe's inside diameter in feet.

Using these formulas, construct a complete C program with a function named `laminarflow()` that returns the laminar flow velocity, $V_{laminar}$, and a function named `velocityflow()` that returns the turbulent flow velocity, $V_{turbulent}$. The functions that are declared as function prototype should calculate the velocities for water, which has a viscosity, $mu$, of 1.9 x $10^5$ lbf-sec/ft$^2$ and a density, $p$, of 1.94 slug/ft$^3$. Suppose pipe diameter, $d$, is 456.3.

The expected output is as shown in Figure 5.

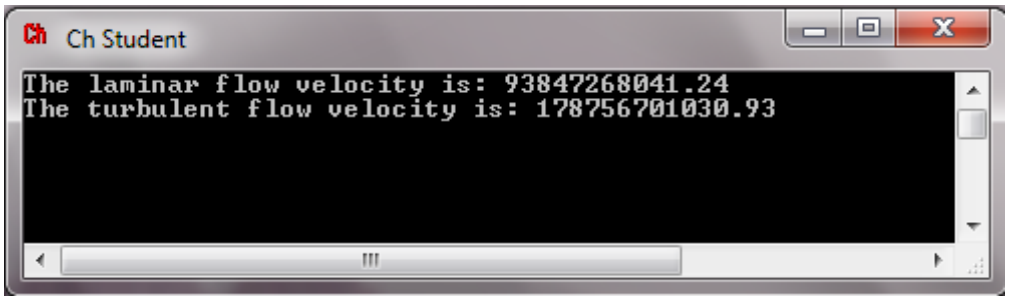



Figure 5: Expected output

(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 6.

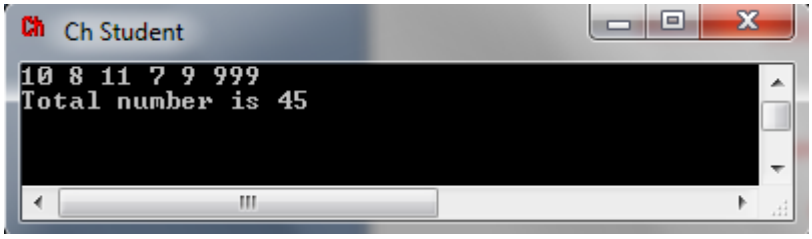



Figure 6: Expected input and output

(10 marks)

**END OF QUESTIONS**