CONFIDENTIAL

Infrastructure University Kuala Lumpur

SUNWAY INT'L BUSINESS SCHOOL

FINAL EXAMINATION
MAY SEMESTER 2017

PROGRAMMING FUNDAMENTALS
(CSC1510)

(TIME : 3 HOURS)

MATRIC NO. : | | | | | | | | | |

IC. / PASSPORT NO. : | | | | | | | | | | | | | | |

LECTURER : NITESH REGMI

GENERAL INSTRUCTIONS

1. This question booklet consists of 7 printed pages including this page.
2. **Section A**: Answer **ALL questions** in the **ANSWER BOOKLET**.
3. **Section B**: Answer **ANY SIX (6) questions in** the **ANSWER BOOKLET**.
4. **Section C**: Answer **ALL questions** in the **ANSWER BOOKLET**.

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INSTRUCTIONS: **TIME: 3 *HOURS***

SECTION A **(30 MARKS)**

There are FOUR (4) questions in this section. Answer ALL Questions in the Answer Booklet.

1. Differentiate the following terms with relevant examples.
   a) continue and break

(4 marks)

   b) printf and fprintf

(4 marks)

   c) if else and switch case

(4 marks)

2. Define sentinel controlled loop.

(2 marks)

3. What is the purpose of default keyword when used in switch case control?

(2 marks)

4. Trace the output of the following program segment
   a)

```
char string1[10] = {'I','U','K','L',' '};
char string2[6] = {'R','E','A','D','Y'};
printf("%s\n", string2);
printf("%s\n", string1);
strcat(string2,string1);
printf("%s\n", string1);
printf("%c\n", string1[0]);
printf("%c\n", string1[8]);
```

(5 marks)

   b)

```
int i=7, j=2;
printf("%d\n", i/j);
printf("%d\n", i%j) ;
printf("%.3f", (float)i/(float)j);
```

(3 marks)

---

c)

```
float x[3];
x[0]=6.4;
x[1]=1.5;
x[2]=1.6;
printf("%.3f\n",x[1]);
printf("%.3f\n",x[1+1]);
printf("%.3f\n",x[1+1]+4);
```

(3 marks)

d)

```
char q1[20]="Hello";
char s1[20]="Goodbye";
printf("%d\n",strlen(q1)+strlen(s1));
printf("%s\n",strcat(q1,s1));
printf("%s\n",s1);
```

(3 marks)

SECTION B **(30 MARKS)**

There are SEVEN (7) questions in this section. Answer ANY SIX (6) Questions in the Answer Booklet.

1. Write an if else statement that will examine the value of `integer` type called `age` and print one of the following messages, depending on the integer value assigned to `age` as in the following table. Display the message "Unknown age value" if the value of `age` is not listed in the table.

Age	Output
1 – 6	Learning Stage
7 – 12	Exploring Stage
13 – 18	Implementing Stage
18 above	Experimenting Stage

(5 marks)

2. Trace the execution of the following while loop and find the output.

```
prod = 1;
m = 1;
while(m <= 5)
{
prod = prod + m;
printf("%d\t%d\n",m,prod);
m++;          }
```

(5 marks)

3. Convert the program segment in question (2) into a :

a) for loop

(3 marks)

b) do while loop

(2 marks)

4. Write a C program using switch that will read in a character and determine if the character is a consonant or a vowel. (Note: vowels are A, E, I, O and U while consonants are rest of the alphabets).

(5 marks)

5. Answer the following questions based on the code below:

```
int sum=0;
int counter=7;
while(counter<=27)
{
sum=sum+counter;
counter=counter+3;
}
printf("Sum = %d and counter=%d",sum,counter);
```

a) How many times will the while loop body be executed?

(1 mark)

b) What will be the last value computed for the variables `sum` and `counter` after the program code is executed?

(4 mark)

6. Given the following function:

```
int Calc(int p, int q, char c) {
      int n = 2, i;

      if (c == '+') {
          for (i = p; i <= q; i++) {
              n = n + q;
              printf("%d ", n);
          }
      } else if (c == '*') {
          for (i = p; i <= q; i++) {
              n = n * q;
              printf("%d ", n);
          }
      }
  }
```

For each of the following statement, determine the values of result.

a) `result = Calc (12, 12, '+');`

(2 marks)

b) `result = Calc (2, 4 ,'*');`

(3 marks)

7. What is the value that is returned by the following function `count`, if the function call is as below:

```
int count(int n)
{
if(n == 0)
 return 0;
else
 return 2 + n + count (n - 1);
}
```

a) `count(0)`

(1 mark)

b) `count(1)`

(1 mark)

c) `count(2)`

(1 mark)

d) `count(3)`

(1 mark)

e) `count(4)`

(1 mark)

SECTION C (40 MARKS)

There is ONE (1) Programming Challenge question in this section. Answer the Question in the Answer Booklet.

1. Write a program that generates 10 random integers from range 1 to 100 and store them in an array `Number`. The program should able to calculate the `total` value, calculate the `average`, and identify the `largest` number. These outputs should be stored in the `Output.dat` file.

   Your program shall include the following functions:

   a) A `main()` function: able to store the information of total value, average value and largest value in the `Output.dat` file.

   (15 Marks)

   b) A function to calculate total values: Function with two parameters (array `Number` and `size`) and return an `int` value (`total`). This function should able to sum up all values stored in the array.

   (10 marks)

   c) A function to calculate the average value: Function with two parameters (array `Number` and `size`) and return a `double` value (`average`). This function should receive result of total value and compute the average.

   (5 Marks)

   d) A function to identify the largest value: Function with two parameters (array `Number` and `size`) and return an `int` value (`largest`). This function should able to identify a largest number stored in the array.

   (10 Marks)

Sample output:

```
The 10 Random numbers are:
3
6
2
4
7
8
9
12
5
1

Total of all numbers: 57
Average value: 5.7
Largest value: 12
```

} stored in the file