RAJATRATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES, MIHINTALE

B.Sc.(General) Degree Examination
First Year-Semester I - September/October 2014
COM 1401 Programming Concepts with C

Answer All **Question** **Time: 3 Hours.**

1.

i. State the rules for constructing C identifiers. (2 Marks)

ii. Describe the meaning of the keywords **static** and **const** with suitable example. (3 Marks)

iii. Write a C statement $x = \frac{2(p+3q)+5}{c+d} - 4y$ (2 Marks)

iv. What would be the output of the following C codes:

a.
```
#include <stdio.h>
int main()
{
int num1, num2;
num1 = 12;
num2 = 43566;
printf("%d\n", num1);
printf("%d\n", num2);
printf("%4d\n", num1);
printf("%05d\n", num1);
printf("%7d\n", num2);
return 0;
}
```
(2Marks)

b.
```
#include <stdio.h>
int main()
{
int a, b, c,
a = 5, b = 2;
c = 5 % 3;
printf ( "%d", c ) ;
return 0;
}
```
(2 Marks)

v. Give examples for **nested** if statements and **nested** while loop statements. (4 Marks)

vi. Convert the following **while** loop to an equivalent **for** loop:

```
#include <stdio.h>
```

```
int main()
{
int x=1;
int y;
while (x <=10)
{
y=x*x;
printf("%d %d \n",x,y);
x+=3;
}
return 0;
}
```

(5 Marks)

2.

i. What is an algorithm? (2 Marks)

ii. The University has the following rules to calculate the grade point:

If the grade is A grade point is 4,
If the grade is B grade point is 3,
If the grade is C grade point is 2,
If the grade is D grade point is 1,
If the grade is E grade point is 0.

Draw a flow chart to read the grade and to calculate the grade point according to the above rules. (5 Marks)

iii. Write a C program to implement the following pseudo code

1. begin
2. total=0;
3. grade_counter=1;
4. while(grade_counter<=5)
5. read grade;
6. total=total+grade ;
7. grade_counter=grde_counter+1;
8. average=total/garde_counter;
9. print average;
10. end.

(3 Marks)

iv. Write a C-program that prints the sum of square of all numbers from Low to High (Low and High should be read from the keyboard). (5 Marks)

3.

i. Explain the structure of C functions. Explain user defined and library functions of 'C'. (4 Marks)

ii. What would be the output of the following C program

```
#include<stdio.h>
```

```
int main()
{
int i = 3, j = 4, a, b;
a= addmult (i, j);
b= addmult (j, i);
printf ( "\n%d %d", a, b ) ;
return 0;
}

int addmult ( int p, int q )
{
int x, y ;
x = p + q;
y = p * q;
return x;
}
```

(3 Marks)

iii. Write a C function named **range** to print all integers between two given values **x** and **y**, where x <= y, and x should be the first argument to the function and y the second argument to the function.
For example, if the call range(1, 10) is executed, this call should print out the 1,2,3,.....10 sequence. (8 Marks)

4.

i. Describe the followings with very short fragment of code that illustrates the syntax involved. In each case explain very briefly what your example achieves.

a. Preprocessor macros and conditional compilation. (3 Marks)
b. Pointer arithmetic in C. (3 Marks)

ii. Give examples for function call by value and call by reference. . (3 Marks)

iii. Write a C program to perform the followings:

a. Define an array called marks of size 10 and type int, and another array called student to store student names for 10 students.
b. Populate the two arrays with marks and names using scanf function.
c. Display the average mark.
d. Display maximum mark and student name belongs to that mark. (6 Marks)

5.

i. Describe the structures in C language. (2 Marks)

ii. Declare a suitable structure type for students in a faculty (which consists only registration no, name, date of birth and grade point average (GPA)). (3 Marks)

iii. Write a function to read and return a student record. (3 Marks)

iv. Write a function to display a student record. (3 Marks)

v. Declare array of structures to hold data of 10 students. (3 Marks)

vi. Write a function to print all student names whose GPA is greater than 2.5 (6 Marks)

6.

i. What are the three important tasks perform when open a file using fopen() function. (2 Marks)

ii. What are the three operations that perform when closing a file using fclose() function (2 Marks)

iii. State the file opening modes. (2 Marks)

iv. Write a complete C program to create a student file containing registration number, name and marks. (3 Marks)

v. Write a function to add 5 records to the created file. (3 Marks)

vi. Write a function to display a name and marks of a particular student stored in above file, when user entered a registration number. (3 Marks)