THE OPEN UNIVERSITY OF SRI LANKA
B.Sc DEGREE PROGRAMME: LEVEL 03
CLOSED BOOK TEST - 2: 2011/2012
CPU1141: INTRODUCTION TO COMPUTER PROGRAMMING

DURATION: **ONE AND HALF HOURS** (1 ½ HOURS)

Date: **24th October, 2011** Time: **4.00 pm – 5.30 pm**

Answer ALL questions.

Q1.

a) Suppose a, b and c are integer variables that have been assigned the values a = 8, b = 3 and c = -5. Determine the value of each of the following C expressions.

i. 2 * b + 3 * (a – c)

ii. a * b / c

iii. a * (b / c)

b) Write a C program to read in a radius of a sphere and print the volume of it, which is given by the following equation,

$$\text{Volume} = \frac{4}{3}\pi r^2 \quad ; r = \text{radius}$$

c) What is the output of the following C program segment, if a = 2, b = 3 and y = 2.

```
/*  calculation part  */
 n1    = a + ( y++ );
 m1    = a + ( ++b );
 m2    = a - ( ++b );
 n2    = a - ( y++ );
 c = m1 / m2;
 d = m1 % m2;

 /* display output */
 printf("sum1 : %d \n", m1);
 printf("sum2 : %d \n", n1);
 printf("sub1 : %d \n", m2) ;
 printf ("sub2 : %d \n" , n2);
 printf ("division : %d \n" , c);
 printf ("Modulo division : %d \n" , d);
 getch();
```

Q2.

a) What is the purpose of the *do-while* statement in C? How does it differ from the *while* statement?

b) Describe the output that will be generated by each of the following C programs.

i.

```
#include <stdio.h>

main()
{
   int i = 0, x = 0;

   while (i < 20)
   {
      if (i % 5 == 0)
      {
            x += i;
            printf("%d ", x);
      }
      ++i;
   }
   printf("\nx = %d", x);
}
```

ii.

```
#include <stdio.h>
main()
{
  int i; j, x = 0;

  for (i = 0; i < 5; ++i)
  {
      for (j = 0; j < i; ++j)
      {
            x += (i + j -1);
            printf("%d ", x);
      }
  }
  printf("\nx = %d", x);
}
```

c) Write a switch statement in C that will examine the value of a char-type variable called `color` and print one of the following messages, depending on the character assigned to `color`.

i. `RED`, if either `r` or `R` is assigned to `color`

ii. `GREEN`, if either `g` or `G` is assigned to `color`

iii. `BLUE`, if either `b` or `B` is assigned to `color`

iv. `BLACK`, if `color` is assigned any other character

Q3.

a) State three (03) advantages to the use of functions in C.

b) What are arguments in C? What is their purpose?

c) Write an appropriate array definition in C, for each of the following problem situation:

i. Define a one-dimensional character array called `point`. Assign the string "NORTH" to the array elements. End the string with the null character.

ii. Define a one-dimensional, six element floating-point array called `consts`. Assign the following values to the array elements:

0.005, -0.032, 1.5, 2.2356, 0.167, 0.015

iii. Define a two dimensional, 3 * 4 integer array called `n`.