

THE OPEN UNIVERSITY OF SRI LANKA  
 DIPLOMA IN INFORMATION SYSTEMS & TECHNOLOGY – LEVEL 03  
 DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING  
 ECX 3265 – FUNDAMENTALS OF PROGRAMMING  
 FINAL EXAMINATION – 2014 / 2015



Date: 9<sup>th</sup>, October 2015

Time: 1330-1630 hrs

<INSTRUCTIONS>

1. Answer **Question 1** in **Part A**, which is compulsory.
2. Answer **3 questions out of 4** given in **Part B**.
3. This is a closed book exam and no reference books and materials are allowed.

**PART A (Compulsory question)**

**Question 1 (40 marks)**

- a) Draw a complete flow chart to illustrate the solution to the following problem given as parts of (b). (10 marks)
- b) Write C programs for following functions (i to iv).
  - i. A function to input the *Item Price* and *Quantity* of the items purchased by a customer and calculate *Amount* for each item and the *Gross Total* of all the items.

$$\text{Amount} = \text{Item Price} * \text{Quantity}$$

*Note: The number of items entered for each customer can vary and therefore the inputs should end with the dummy value for -99 for Item Price.*

(5 marks)

- ii. A function to calculate the *Discount-Amount* and the *Final Total*.
  - a. The *Discount-Amount* should be calculated as follows;
    - i. If the Gross Total  $\leq 3000$  then discount is 5% of the gross
    - ii. If the Gross Total  $\leq 6000$  the discount is 10% of the gross
    - iii. If the Gross Total  $> 6000$  the discount is 15% of the gross

$$\text{Final Total} = \text{Gross Total} - \text{Discount-Amount}$$

(10 marks)

- iii. A function to print the Customer name, Date, the number of different items purchased, the Discount-Amount and the Final Total. (5 marks)
- iv. Write the complete C program for one customer with correct function calls and parameter passing. You may make any other necessary assumptions but write them clearly. (10 marks)

**PART B****Question 2 (20 marks)**

- a) Write a C Program to do the following tasks. (10 marks)
- Take user inputs of integers up to 100 numbers and store them in an array.
  - Can stop taking inputs anytime when the user input as -1.
  - Then find the square of these numbers and assign them to another array.
- b) Assign these values [11, 12, 13, 14, 15] to an integer array. Use a pointer to point from the first element of the array to the last element, and display the array elements.  
*Note: Variables used for the loop and with the printf statement should be pointer values.* (10 marks)

**Question 3 (20 marks)**

- a) Write a single C statement for each of the following; (6 marks)
- i. Subtract the value of A by 1 and then subtract B from A and assign the result to C.
  - ii. Assign the remainder of X divided by Y to Z and decrease the value of X
  - iii. Increase the value of X by 1 and find the remainder of X divided by Y. Assign the result to Z.
- b) Write the declaration for **struct** type to contain following information. (10 marks)
- Name: (string of characters)
  - Student number: (string of characters)
  - Class: (junior, senior, freshman)
  - Sex: (male, female)
- c) Declare a structure variable for `student1` of type declared in part (b) and assign "Amal" for Name. (4 marks)

**Question 4 (20 marks)**

Write the output of following two programs.

(a)

```
#include <stdio.h>

main() {
    int i,j =2, sum =0;

    for (i =1;i<3; ++i)
        for(j=0; j< i; j++)
            printf("\n i= %d", i+j+1);
            printf("\n sum = %d", sum+ 1);

    return 0;
}
```

(b)

```
#include<stdio.h>

void main() {
    int i, j,k =0;
    int x =0;
    for (i=0; i<3; ++i)
        for(j=0;j<i; ++j) {
            switch(i+j-1) {
                case -1:
                case 0: x =x+1; break;
                case 1: case 2:
                case 3: x =x+2;break;
                default: x =x+3;
            }
            printf("%d", x++);
        }
    printf("\n x = %d", x);
}
```

**Question 5 (20 marks)**

a) What is the output of the following program?

(8 marks)

```
#include <stdio.h>

int main()
{
    int n =10;
    int *newPtr;
    newPtr= &n;

    printf("%d\n", *newPtr);

    int *anotherPtr = 0;
    anotherPtr = &n;
    printf("%d", *anotherPtr);
}
```

b) Write a program to assign "dills" to string1 and then copy string1 to string2. Next, concatenate string2 with string3 which contains "Daffo". Then compare string3 and the word "Daffodills" and give the output.

*Note: Use string functions such as strcpy, strcat and strcmp for string manipulations.*

(12 marks)