THE OPEN UNIVERSITY OF SRI LANKA

Faculty of Engineering Technology

Department of Electrical and Computer Engineering

Diploma in Information Systems & Technology

ECX3265/ EEX3465 –Fundamentals of Programming

Final Examination – 2017/2018

Time Allowed: 3 hours

DATE: **27th October 2018** TIME : **09.30 a.m. to 12.30 p.m.**

Instructions to Candidates

1. This is a **CLOSED BOOK** examination.
2. This question paper contains five (05) questions in 5 pages.
3. SECTION A has one (01) **Compulsory** Question and SECTION B has four (04) Questions
4. Answer **Question 01** in **SECTION A** and **any THREE (03)** questions from **SECTION B.**

SECTION A

Question 01 ***(Compulsory)***

a) Answer the questions using the following description.

A manager of a cricket team need to maintain the scores of batsmen in a cricket match. A cricket match has two innings and there are 11 players batting. Players are numbered 1 to 11 in the order they bat. The following shows a sample scores of players in a match

1st Inning: 23, 65, 17, 4, 0, 3, 2, 0, 22, 12, 10

2nd Inning: 12, 51, 103, 8, 12, 0, 0, 2, 1, 0, 5

A programmer suggested creating a multi-dimensional array to store the data.

i. Declare a two-dimensional array called ***scores*** to store the batting scores of players.

[5 marks]

ii. Write a function called ***highestscore*** that takes the inning number (i.e. 1 or 2) as a parameter and returns the highest score for the inning

[8 marks]

iii. Write a function called playerwithhighestscore that takes the inning number (i.e. 1 or 2) as a parameter and returns the position of the highest scorer (i.e. a number from 1 to 11).

[8 marks]

iv. Write a function called ***totalscore*** that takes the inning number (i.e. 1 or 2) as a parameter and returns the total score for that inning.

[8 marks]

v. Write a main program that uses the three functions ***highestscore***, ***playerwithhighestscore*** and ***totalscore*** to produce the following report with actual data for a cricket match:

Total runs for inning 1:
Total runs for inning 2:
Highest score for inning 1
The position of the player with the highest score for inning 1
Highest score for inning 2
The position of the player with the highest score for inning 2
Average runs per player in inning 1:
Average runs per player in inning 2:

[11 Marks]

SECTION B

*Answer any **THREE (03)** questions*

Question 02

a) A teacher needs to create a program to store the first names of students of her class and then check if a student by a particular name is in her class. Write a C program that declares an array capable of recording the names, initialize the array with the names "Amal", Kamal", "Chamal", "Wimal", "Bimal" and "Namal", and check if "Sunimal" is in the array and display a suitable message.

[12 marks]

b) The following program which was written by a student to print numbers from 1 to 10 contains some errors when compiled. Rewrite the code by correcting the errors, so it runs and produces the required result.

```
#include <stdio.h>
int main(void) {
        int counter;
        for (counter = 1, counter < 10, counter++) {
                printf("Counter value is : %d \n", &counter) ;
        }
}
```

[8 marks]

Question 03

a) By using a suitable examples, draw flowcharts to show the following programming constructs:

(i) Conditional statement

(ii) Counter controlled Loop statement

[10 Marks]

b) Write a function called ***numberisodd*** that takes an integer parameter and returns true if the value in the parameter is odd and false if it is even. Use the function in a main program to display whether the values {4,23,72,13,68} are odd or even. Use suitable messages.

[10 marks]

Question 04

a) A teacher needs to store the following data relevant for Continuous Assessment Marks of students:

First Name (20 characters), Last name (50 characters), Registration number (number), CAT Mark (number), Lab1 Mark (number), Lab2 Mark (number), Mini Project Mark (number)

Declare a structure in C language named student to represent the data and create a variable of the structure type called student1. Use self-descriptive variable names and suitable data types in your declaration.

[6 Marks]

b) Write statements in C to record following values in ***student1*** variable

First Name	Last Name	Registration Number	CAT Mark	Lab 1 Mark	Lab 2 Mark	Mini Project Mark
Rushanthi	Silva	71625387	56	34	67	75

[4 Marks]

c) The final CA mark is calculated as follows:

CA Mark = CAT mark *0.3 + Average (Lab1 Mark, Lab2 Mark) * 0.3 + Mini Project Mark * 0.4

A student who obtains a CA mark less than 40 is not eligible to sit the final exam. Write a function called ***eligible*** that takes the CAT Mark, Lab1 Mark, Lab2 Mark and Mini Project Mark as arguments and returns true if the student is eligible to sit the final exam or false if not.

[10 Marks]

Question 05

a) Draw a flow chart for a program to sum the first 5 even numbers.

[12 Marks]

(b) Write the output of following programs:

(i)

```
# include <stdio.h>

int main()
{
  int y = 20;
  int *ptr1, *ptr2;
  ptr1 = &y;
  ptr2 = ptr1;
  *ptr1 = 350;
  *ptr2 = 25;
  printf("Value at ptr1 is %d \n", *ptr1);
  printf("Value at ptr2 is %d \n", *ptr2);
  return 0;
}
```

(ii)

```
# include <stdio.h>
void fun(int *ptr)
{
    *ptr = 30;
}

int main()
{
  int y = 20;
  fun(&y);
  printf("%d", y);

  return 0;
}
```

[08 Marks]

--- End ---