

The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Electrical and Computer Engineering



Study Programme	: Bachelor of Software Engineering Honours
Name of the Examination	: Final Examination
Course Code and Title	: EEX3467 Software Engineering Concepts & Programing
Academic Year	: 2019/20
Date	: 14 th August 2020
Time	: 0930-1230hrs
Duration	: 3 hours

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of **Five (5)** questions in **Four (4)** pages.
3. Answer **all questions**
4. This is a Closed Book Test (**CBT**).
5. Answers should be in clear hand writing.

Question 1 [20 marks]

Read the following description to calculate payment for daily paid workers in a tea factory and answer the parts of Question 1 given below.

Write a program to prompt the user to input number of workers, rate per hour, worker ID, hours worked to compute the gross pay of a worker for a week. Pay should be the normal rate for hours up to 48 hours and double for the hourly rate for all hours worked above 48 hours.

Design a function called computePay() to do the computation of pay and returns the value.

Inputs should be positive numbers, otherwise the program should display an error message. After weekly pay is calculated, the worker ID and the amount need to be paid should be written into a Text file.

- a) Draw a flow chart indicating begin, end, inputs, outputs, iteration and conditional control structures. [10 marks]
- b) Write a C program to implement program given in the flow chart including header files, main function, inputs, outputs, iteration, and conditional structures. Include comments where necessary. Give meaningful names to variables. [10 marks]

Question 2 [20 marks]

Read the following scenario and answer the parts of Question 2.

- A Pizza Ordering System allows customers to order pizza for home delivery.
- To place an order, a customer searches to find items to purchase, adds items one at a time to a shopping cart, and possibly searches again for more items.
- When all items have been chosen, the customer provides a delivery address.
- If not paying with cash, the customer also provides credit card information.
- The system has an option for customers to register with the Pizza shop.
- Customers can then save their name and address information, so that they do not have to enter this information every time that they place an order.
- System should be easy to use

- a) Identify actors and business processes in this scenario and draw a complete use case diagram to illustrate the given requirements. (10 marks)
- b) Briefly describe three (3) non-functional requirements for this system, which can be objectively validated (6 marks)
- c) List two ambiguous requirements or platitude/s that can be found in this Requirement Statement. (4 marks)

Question 3 [20 marks]

- a) Briefly explain boundary value analysis in black box testing. (2 marks)
- b) Read the following module description and answer the questions:
This module is a web page collecting donations for flood victims in Sri Lanka. It allows entry of a contribution from Rs. 100 to Rs. 999,999.99.

For each test case generated by boundary values analysis, specify the boundary values covered, input values, and expected outputs. (10 marks)

- c) Answer the following questions regarding the given pseudocode.

```

Integer A, integer B
Read A
Read B
If A < B then
    Print 'A is the smaller number'
Else
    If A = B then
        Print 'they are same'
    Else
        Print 'B is the larger number'
Endif

```

- i) Draw a flow graph for the above algorithm (6 marks)
- ii) What is the Cyclomatic Complexity for this flow graph? (2 marks)

Question 4 [20 marks]

- a) Briefly describe three (3) ways that you can collect requirements from a customer. (3 marks)
- b) Give two reasons why expert users may not prove to be a good source of information about the requirements for an interactive system. (2 marks)
- c) List the five (5) documents that are produced as the output of any Process Model. (5 marks)
- d) When you are going to develop a software system for a given set of requirements, what criteria would use to determine a suitable Software Process Model? (6 marks)
- e) Briefly describe two (2) Software Process Model that gives high attention to risk. (4 marks)

Question 5 [20 marks]

- (a) Write **one** complete C program including header files using pointers to declare the following integer array, assign values to it and display the values stored in the array.

```
int arrayQ5[5] = {963, 10, 89, 789, 111}
```

(12 marks)

You are supposed to use **pointers** and **loops** to display the values of the array elements.

- (b) Consider the program given and answer the questions below.

(8 marks)

```
#include <stdio.h>
void main()
{
// declare variables
    int i=0;
    int MyArray[10];
    int sum=0;
    int N=9;
    float average=0;
    for(i=0;i<=N;i++)
    {
        printf("Enter %d integer number ",i);
        scanf("%d",&MyArray[i]);
    }
    for(i=N;i>=0;i--)
    {
        printf("%d\n", MyArray [i]);
        sum=sum+ MyArray [i]; }
    average=sum/N;
    printf("Average = ", average);
}
```

- i. What will be the output of the above program?
- ii. If you want to enter data with decimal points, what changes should do to the program?
- iii. If you want to enter only five numbers to get the output, what changes should do to the program?
- iv. Change and write the program to calculate the average only if N is greater than or equal to 2.