00050

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	**: EEX4467/ECX4267 Software Engineering Concepts**
Academic Year	: 2017/18
Date	: 16th February 2019
Time	: 9:30-12:30hrs
Duration	: **3 hours**

General Instructions

1. Read all instructions carefully before answering the questions.

2. This question paper consists of **Five (5)** questions in **two (2)** pages.

3. Answer **Question (1)** in **Part (A)** which is **compulsory** and **Answer three (3)** questions out of **4** given in **Part (B)**.

4. Question (1) carries 40 marks and other questions carry 20 marks each.

4. Answer for each question should commence from a new page.

5. This is a Closed Book Test (CBT).

6. Answers should be in clear hand writing.

7. Do not use Red colour pen.

Part A

Answer all questions considering the scenario given below.

The Management Board of a small private hospital wants certain management functions be computerised to streamline their operations. It should enable to improve the response time to demands of patients. The system will be used by the hospital managers, doctors, Nurses, cashiers, clerks who enter patient details and the network administrator.

Their main functional requirements are listed here;

- Patient registration, appointment scheduling with consultants, admissions, discharge, transfer, Doctors workbench, Nursing workbench, patient medical record, central stores, billing, pharmacy management, Room management and Ward management

Their Non-functional requirements are listed as;

- Privacy, security, user friendly administration, performance/response time, back up and restore, easy GUI

Please state your assumptions clearly when answering the questions.

Question 1

(a) Draw a complete use case diagram to illustrate the given requirements. (20 marks)

(b) Draw a class diagram with attributes, relationships and operations to support the business processes in the use case diagram. (15 marks)

(c) Write five (5) non-functional requirements that are given for this scenario in a measurable way. (05 marks)

Part B

Answer only three (3) Questions

Question 2

a) Explain why you need a software life cycle process? (3 marks)

b) What are the main issues faced by developers when using 'Water fall Model' as the process model for software development? (6 marks)

c) Assume you were to undertake the development of a product beset with a large number of technical as well as customer-related risks. Which software process model would you adopt and briefly explain why? (6 marks)

d) Software engineering process involves many activities. What are the benefits of process improvements? (5 marks)

Question 3

a) Do you agree that "iterative and incremental development are essential parts of Agile development"? Justify your answer. (5 marks)

b) Briefly describe three (3) advantages of Iterative and incremental development. (6 marks)

c) Name two (2) Agile software development methodologies and write one distinct feature in each. (4 marks)

d) Briefly explain the activities involved in the process of user interface design. (5 marks)

Question 4

a) Maintenance is a fact of life in any software product. It is a mandatory task that cannot be overlooked. Why do software systems need maintenance? Briefly explain four (4) reasons. (8 marks)

b) A company has acquired another company which sells office automation software which has a large market share with many satisfied users. How would you maintain this system which has no documentation and even the source code is not commented? (3 marks)

c) Differentiate between re-engineering and reverse engineering using examples. (4 marks)

d) Assume you have been asked to build a safety critical system which will depend on software to have ultra-high reliability. What techniques do you propose to use to design such a system? (5 marks)

Question 5

a) Name two (2) documents related for testing of a software project. (2 marks)

b) What can a software engineer derive from White box testing? (4 marks)

c) What type of errors does Black box testing attempt to find? (4 marks)

d) Draw a flow diagram for the procedure given below and compute cyclomatic complexity. (10 marks)

```
Procedure small (top, x:integer)
var k, y: integer;

begin
    y = 0;
    k = 0;
    while k =< top do
            begin
                    y = y +x;
                    k = k +1;
            end;
           if (y > 100) then writeln ("y is larger")
                    else writeln ("y is small")
end;
```