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

053

Study Programme	: Bachelor of Software Engineering Honours
Name of the Examination	: Final Examination
Course Code and Title	**: EEI6567-Software Architecture and Design**
Academic Year	: 2020/21
Date	: 15th January 2021
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 **Three (3)** pages.
3. Answer **all question from section A and any two questions from Section B** .Questions in Section B carry equal marks.
4. Answer should be written in answer book provided .Answer for each question should commence from a new page.
6. This is a Closed Book Test **(CBT).**
7. Answers should be in clear hand writing.
8. Do not use red colour pen.

Section A

Answer All from Section A

1. Your company is asked to develop a software system for Fingerprint-based ATM system, and you are the architect. Following features are expected out of this new solution.
   - This project is a desktop application that uses the fingerprint of users for authentication.
   - Since everyone has a unique fingerprint, this method of using fingerprint as a means of authentication to access your ATM is safer and more secure than using an ATM card.
   - Users need always not carry their ATM cards with them – they can use their fingerprint to access ATM services.
   - To use the fingerprint-based ATM system, users must log in to their account using their fingerprint.
   - After logging in, once they provide their unique pin, they can conduct all kinds of banking transactions, from withdrawing cash to money transfer, and even viewing their account balance.
   - Furthermore, users can also check the last five transactions from their account.

   a) It is obvious that this kind of an improvement to the ATM system is costly. Is it worth spending this much for this kind of a project? explain with reasons (5 Marks)
   b) Identify few more features that can be provided, by introducing a software system. (5 Marks)
   c) Draw a use case diagram for this system (5 Marks)
   d) Identify major software components (5 Marks)
   e) List down the stakeholders of this system (5 Marks)
   f) Draw a diagram to depict the high-level logical architecture of this system you are going to design (10 Marks)
   g) Discuss two non-functional requirements that need to be considered in this system - (Explain why these are important in a Fingerprint-based ATM system) (5 Marks)

   (Total-40 Marks)

2. You are the Architect of your company and there is project proposal from local medical authorities with below problem statement.
   Many deadly diseases are preventable and can be cured if treated at an early stage. However, people tend to ignore the early symptoms of a disease as they are mild. By the time they become aware of the disease, the infection has already spread into their body. Hence, it is always advisable to have a regular body check-up to avoid health issues later. But due to day-to-day busy schedule many times it is not possible for the patients to go and get a medical appointment booked in person. Which leads to a delay in the treatment and may cause a major health problem later.

   The Online Doctor Application proposed here is an Android based smart application that will help the users to identify a disease based on the symptoms. When a patient enters his /her symptoms the system will incorporates custom made algorithms to identify the disease. Then based on the disease identified the system will recommend a list of doctors having expertise

on that disease. The patients can book an appointment with the doctors as per their preferred time & date. The patients can also chat with a doctor to get consultations.

a) As an architect, what do you consider as your responsibilities? (5 Marks)

b) Write down five functional requirements and five non-functional requirements with higher priority. Explain the reasons for selecting them as higher priority requirements. (5 Marks)

c) Write down three architectural decisions you made as the software architect of this project. (5 Marks)

d) Name the stakeholders of the given case. Write down how each stakeholder is involved in the system (5 Marks)

(Total - 20 Marks)

Section B

Answer any 2 from below each questions carry 10 marks

3. Answer all the questions

a) What are the main 3 categories of software quality attributes? Give 2 examples for each category. (6 Marks)

b) Describe why software quality attribute prioritization is required and provide 2 examples on selecting the priority based on the problem statement. (4 Marks)

c) List down 5 actions that we can take to improve the performance of the software system. (5 Marks)

d) List down 5 decision that you can take during the user interface design to improve the usability of the system. (5 Marks)

4. Briefly describe answers for below questions.

a) Name the 4 types of software Maintenance and describe each. (5 Marks)

b) Name 4 system artifacts that needs to be evolved during the change request implementation to the existing system. (5 Marks)

c) Explain the difference between Forward Engineering and Reverse Engineering.(5 Marks)

d) Explain the steps that you follow during the impact analysis process of a change request. (5 Marks)

5. Briefly describe answers for below questions.

a) Explain 3 important advantages and 2 important disadvantages of cloud computing. (5 Marks)

b) Name 5 Characteristics of Cloud Computing (5 Marks)

c) Name 4 types of cloud and describe each with its characteristics. (5 Marks)

d) Name 3 common Cloud service models describe each its characteristics (5 Marks)