



# United International University (UIU)

## Dept. of Computer Science & Engineering (CSE)

Final Exam Trimester: Spring 2022 Marks: 40 Time: 2 Hours  
Code: CSE 3411/CSI 311 Course Title: System Analysis & Design

***“Any examinee found adopting unfair means will be expelled from the trimester / program as per UIU disciplinary rules.”***

Answer **ALL** of the following questions:

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### **QUESTION 1**

**[ CO3 ]**

**15**

Consider the following scenario of UIU Library Books Rental Services Web application:

“UIU has opened an online book rental system for the students of UIU. It allows a student to rent maximum five books for 2 weeks. The student requests for books through the **Rent Book** process from the web application. Students need to provide ID and name for this purpose. The process uses the STUDENT database to verify the credentials. If the information is valid, the BOOK database is searched. If the book is unavailable an error message is shown. If the book is found, a student can select his desired number of book/s in an iterative way. At the end of Rent Book process, the BOOK\_RENT database is updated having the book list, student’s info, and rental duration information. With this info an invoice is also sent to the student for future reference. The student needs to go physically to the university library for receiving the books.

At the time of returning the books, a student needs to return those to an attendant of Library. The attendant verifies the invoice and uses the **Return Book** process online to make updates in the BOOK database. If any student returns the books after due date, a process **Calculate Fine** initiates, that automatically calculates a fine and the STUDENT\_ACCOUNTS file will be updated having rental info with fine amount. The student has to pay the fine in the usual way i.e. by going to the bank to deposit cash or through DBBL ATM card. The Accountant updates the payment updates in STUDENT\_ACCOUNTS file. If the student does not clear any outstanding fine by the end of a trimester, the process **Notification Engine** notifies UCAM. It also sends a reminder to the STUDENT’s email address. A database NOTIFICATION\_TRACKER is maintained to achieve the purpose.”

- a) Draw DATA FLOW DIAGRAM for the above scenario and mention some major rules of drawing DFD. [5]
- b) Draw the USE CASE Diagram (having at least one “include” and “extend” connection). Mention the purposes of include or extend symbol. [5]
- c) Write down the USE CASE Descriptive Form for one of a major Use Case. [5]

**QUESTION 2****[ CO3]****15**

Consider the following scenario for a “Hospital Telemedicine System”:

United Hospital is going to provide remote medical support to the patients. A **Visitor** can view the doctor profiles, appointment schedules, and general queries about COVID-19 or Monkey pox and responses to them on the website. A **Subscriber** can book an appointment, purchase medicine, or post a query. **Moderators** can reply to a query, post announcements, and reschedule an appointment upon request by a subscriber. **Doctors** can create or update schedules according to their availability. They also write articles on how to stay safe from COVID-19 or Monkey pox infection.

When a subscriber books an appointment, he/she visits the FIND A DOCTOR page and searches for doctors in a particular discipline. After selecting a doctor from the DOCTORS LIST page, the subscriber selects a time slot from the available schedule. The subscriber needs to make the payment via bKash, nagad, or debit/credit card at least 6 hours before the time of the appointment. The subscriber can reschedule or cancel any booking with a penalty at least 2 hours before the time of the appointment

Management of multiple patients in a single time slot is done by a first-come-first-serve manner. To have the consultation, the subscriber needs to log in at first. After that the subscriber request requests to join the WAITING ROOM. If an appointment is scheduled and the payment is confirmed, the subscriber is allowed to enter into the waiting room. Otherwise, the entry is denied. The doctor allows one single patient from the waiting room into the ONLINE CHAMBER at a time. After having the consultation, the patient downloads a prescription and leaves the online chamber.

- a) Draw the **CRC card** and **CLASS DIAGRAM** for the above scenario. Mention the best practices to identify the classes for any practical scenario. [3+5+2]
- b) Draw a **SEQUENCE DIAGRAM** for pre-selection to confirmed appointment state also mention the purposes of different symbols in the diagram. [5]

**QUESTION 3****[CO4]****10**

- a) Brief on any major two/three characteristics of a good SRS document. 2
- b) An SRS document can support/help to the different stakeholders of a software development project – justify it. 3
- c) Briefly explain the concept of functional and non-functional requirements of any software project – consider a proper realistic scenario. 3
- d) Mention the major guidelines/golden rules of UI design. 2