



# United International University (UIU)

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

Final Exam Trimester: Spring 2024 Marks: 40 Time: 2 Hours

Code: CSE 3411 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 the following questions:**

#### **Question 1:**

**[CO3]**

**[18]**

Consider the following scenario:

“HealthHub” is a new mobile app that helps people improve their health. It has lots of features to help users create personalized health plans. When users sign up, they answer questions about their health, like how fit they are, what they like to eat, and any health goals they have.

There are three types of users: “Guest users” can do basic things like look at workout plans and read health tips; “Registered Users” have profiles in the app, so they get more features; “Administrators” can do more advanced stuff like managing content and users.

In “HealthHub”, users can chat with health experts who are certified to give personalized advice and support. These experts help users with their health concerns, like giving tips on food and exercise. They also help users overcome any problems they have. As users get better, the health experts give them feedback and tips to make their health plans even better. So, users get help and advice to reach their health goals.

Overall, “HealthHub” is a helpful tool for anyone looking to improve their health. It gives users the tools, advice, and support they need to make healthy changes and reach their fitness goals.

Considering the above scenario, answer the following questions:

- a) Design a Use Case Diagram for “HealthHub” application. Include at least one include/extend relationship. [4]
- b) Draw the Class Diagram and CRC card for “HealthHub” application by identifying the main classes and their relationships. [4+2]
- c) Create a State Diagram on the activities of the health experts at “HealthHub” application. [4]
- d) Draw a Sequence Diagram demonstrating the process of creating a personalized health plan on “HealthHub”. [4]

**Question 2:****[CO4]****[5]**

a) Imagine you and your team are considering a new project in the field of renewable energy. The project involves setting up a wind power farm. The initial investment required for the project is \$20,000, which will cover the costs of wind turbines. You spent \$3000 for equipment and installation in the 3rd year. In the 5th year, you had to bear the expenses for the maintenance of turbines \$5000. The projected revenues are as follows: Year 1: \$40,000, Year 2: \$55,000, Year 3: \$70,000, Year 4: \$80,000, and Year 5: \$90,000. Consider the rate of interest is 12%.

Determine whether the project is financially sustainable for your team or not using the following two methods: [3]

i. Net Present Value

b) Mention the concept of Behavioral feasibility. Why it is important to analyze before an IT product development. [2]

**Question 3:****[CO3]****[12]**

a) "An effective SRS should uphold the fundamental 3C attributes: Completeness, Correctness, and Consistency" – define and justify [3]

b) Determine the functional and non-functional features/requirements for the scenario mentioned in Question 1. [4]

c) Mention some (at least three) best practices/guidelines to do the UI design for any Software product. Draw a UI Design for the "Homepage" of "HealthHub" application. Mention the UI design principles that you have followed for this case. [2+3]

**Question 4:****[CO3]****[5]**

a) Write down an SRS document and present it as a group having the following parts on your software project work covering: Introduction, System Study, System Analysis, Feature list fixation with Functional and Non-functional requirements, Different Feasibility Analysis, System design (UML diagrams), UI design through Figma software, implementation plan etc. (**no need to answer this question in the examination**, it has already been evaluated in classroom activities). [5]