0085

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

Study Programme	:	Bachelor of Science Honours in Engineering
Name of the Examination	:	Final Examination
Course Code and Title	:	**EEX4347 Software Engineering Concepts**
Academic Year	:	2024/25
Date	:	05th March 2026
Time	:	0930-1230h
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 **all** questions.
4. Answer for each question should commence from a new page.
5. This is a Closed Book Test (CBT).

Question 01 [25 Marks]

A private hospital group plans to develop a **Web-based Hospital Appointment and Patient Management System (HAPMS)** to improve the efficiency of patient services and reduce manual work.

Currently, patients must physically visit the hospital or call the reception to book appointments. This process causes long waiting times, booking errors, and poor record management. The hospital wants to replace this with an **online system** accessible via **desktop and mobile devices**.

Patients must **register and log in** using a valid email and password. A patient can,

- Search for doctors by specialization, availability, or hospital branch
- View doctor profiles including name, specialization, available days and time slots
- Book, reschedule, or cancel appointments
- View upcoming and past appointments

Doctors can log in to the system. Doctors can,

- Set available days and time slots
- View daily appointment schedule and accept or reject appointment requests
- Update appointment status (completed / cancelled)

Administrators manage the overall system. They can,

- Add, update, or remove doctor records
- Manage patient accounts

- Generate reports such as daily appointments, doctor workload, and patient statistics
- Configure system settings such as clinic hours and notification rules

a. Explain **two Agile principles** and how they help in developing this system.
[*04 Marks*]

b. Describe two **requirement elicitation techniques** suitable for this system. Explain why they are appropriate.
[*04 Marks*]

c. Identify four functional requirements of the system. Briefly justify each.
[*08 Marks*]

d. Identify three non-functional requirements. Explain why each is important.
[*06 Marks*]

e. Write one user story related to appointment booking and explain how it helps identify requirements.
[*03 Marks*]

Question 02 [25 Marks]

a. Draw a Use Case Diagram for the Hospital Appointment Management System. Clearly show actors and main use cases. (State any assumptions.)
[*16 Marks*]

b. Identify three classes in the system. For each class, write at least two attributes and two methods.
[09 Marks]

Question 03 [20 Marks]

a. Draw an Entity Relationship (ER) Diagram for the system with at least four entities and correct relationships. (State any assumptions.)
[12 Marks]

b.

i. What is database normalization?
[*02 Marks*]

ii. Explain 1NF to 3NF using a simple example related to the system.
[*06 Marks*]

Question 04 [10 Marks]

a. Explain three web technologies (frontend or backend) suitable for this system.
[*06 Marks*]

b. Write an SQL query to display all appointments booked for a given doctor ID.
[*04 Marks*]

Question 05 [20 Marks]

a. Explain four software testing types that should be used for this system.
[*08 Marks*]

b. What is usability testing and explaining two usability principles used in HCI.
[*06 Marks*]

c. Describe two common user interface design mistakes and how to avoid them.
[*06 Marks*]

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