

BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination: Quiz 2
Semester: Fall 2024

Duration: 30 min
Full Marks: 15

CSE 470: Software Engineering

Name:	ID:	Section:
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Green Valley Hospital, a leading healthcare provider, implemented an advanced Hospital Management System (HMS) to efficiently manage its operations. The system involves several key entities: **Hospital, Doctor, Patient, Appointment, MedicalRecord, Admin, Nurse, and Staff.**

At the core of the system is the **Hospital**, which serves as the central hub. The hospital has a list of doctors, patients, appointments, and medical records. It provides functions such as finding doctors based on their specialty and listing available slots for appointments.

The **Doctor** class represents the medical professionals employed by the hospital. Each doctor has attributes like doctorID, name, specialization, availability, and contactInfo. Doctors can schedule appointments for patients and update their availability. The **Hospital** aggregates the Doctor class, as doctors can exist independently but are an essential part of the hospital's operations.

Patients are central to the system, represented by the Patient class. Each patient has attributes like patientID, name, contactInfo, and medicalHistory. Patients can request appointments, and view their medical history.

The **Appointment** class links doctors and patients. It stores information about the appointment's date, time, and status. Patients can schedule appointments, while doctors also can manage appointments. The **Appointment** class depends on both the **Doctor** and **Patient** classes to function, as both are required to schedule an appointment.

The **MedicalRecord** class holds vital health data, a list of treatment details, and visit dates. Each patient has one or more medical records, which are updated as needed. The **Patient** class compositionally the MedicalRecord, meaning that the existence of a medical record is tightly bound to the patient.

The **Admin** class oversees administrative tasks such as adding new patients, and generating medical bills. Admins have common staff attributes like name, role, and employeeID which they inherit from the **Staff** class. The **Nurse** class also inherits from the **Staff** class, representing other hospital staff members who assist in patient care. Nurses can view patient records and administer medication.

This tightly integrated system ensures that the hospital operates smoothly, with clear dependencies and relationships between patients, doctors, staff, and medical records. This dependency between classes ensures data consistency and operational efficiency.

1. Design a UML class diagram from the above scenario. [10]
2. Write down three functional and two non-functional requirements from the given scenario. [5]

Solution: [add the multiplicity according to your intuition]

