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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Midterm Examination, Spring 2026
Course Code: CSE227, Course Title: System Analysis and Design
Level: Term:2 & 2 Batch: 67

Time: 01:30 Hrs **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

Most of the current Bangladeshi public hospitals deal with patient records, appointments, prescriptions, laboratory reports and billing in paper-based files and disconnected computer systems. Patients have to visit hospitals physically to make appointments, which causes long queues and overcrowding. Paper records cause losses in locating records, records being duplicated, lab reports taking long to appear, billing mistakes, and slow emergency response due to lack of real-time patient data access.

The Ministry of Health has decided to use a Smart Hospital Management System to enhance the quality of healthcare services. The system will digitize and integrate hospital operations into a unified platform. Patients will be able to book appointments online, and centralized Electronic Health Records will allow authorized medical staff to access accurate patient data instantly.

The system will combine laboratory and pharmacy services, allowing digital prescriptions, tracking bed availability in real-time, and prioritizing the emergency cases automatically. It will also produce analytical reports to keep track of hospital performance and disease patterns. To ensure data security, the system will implement role-based access control for doctors, nurses, lab technicians, pharmacists, billing officers, and administrators. Overall, Smart Hospital Management System is designed to improve efficiency, transparency, and quality in healthcare services of the state hospitals.

Now answer the following questions

1.	*a)*	Identify and explain the operational, tactical and strategic, and information required for the Smart Hospital Management System (SHMS). Clearly describe how each type of information relates to different levels of hospital management structure.	[4]	CO1
	b)	Explain how good interpersonal relations, effective communication skills, and analytical thinking ability of a System Analyst contribute to the successful development and implementation of the Smart Hospital Management System. Provide brief examples from the hospital context.	[3]	
2.		Identify different sources of information for gathering system requirements of the above system. Also specify appropriate information-gathering techniques for each source and justify your answer. If any survey form is required to collect information, then design the suitable sample form.	[6]	CO2
3.		Draw the Level 0 (Context Diagram) and Level 1 Data Flow Diagram (DFD) for the Smart Hospital Management System. Clearly show the External Entities, Major Processes, Data Stores and Data Flows in your diagrams. Ensure that all elements are properly labelled and logically connected.	[2+4]	CO2

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4.		In Smart Hospital Management System, when a patient attempts to book an appointment through the online portal, the system follows these rules: When a patient logs in, the system first verifies whether the patient is registered. If the patient is not registered, the system prompts for registration before proceeding. If registered, the system checks the availability of the selected doctor. If the doctor is unavailable, the system suggests alternative available time slots. If the doctor is available, the system checks whether the patient has any unpaid bills. If unpaid bills exist, payment must be completed before confirming the appointment. If there are no unpaid bills, the system confirms the appointment and updates the doctor's schedule. If the appointment is marked as an emergency case, the system bypasses normal scheduling and immediately notifies emergency medical staff. **a)** Draw a Decision Tree representing the appointment booking logic of the system. **b)** Construct a Decision Table based on the decision tree developed.	[3+3]	CO2

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