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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Mid Examination, Summer 2025
Course Code: CSE227, Course Title: System Analysis and Design
Level: 2 Term: 3 Batch: 65

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.]

1.	A healthcare startup named RAY, wants to develop a telemedicine platform and responsive patient dashboard where patients/users can see their upcoming appointments, past consultations, and prescriptions and book virtual consultations with doctors. The platform should support video calls, online prescriptions, and secure patient data storage. However, different stakeholders (doctors, patients, and administrators) have conflicting requirements. In addition, a system has been developed and is in the testing phase. The system allows users to transfer money, pay bills, and check their balance. During testing, some users report that transactions sometimes fail without showing an error message.			**CO1**
	a)	Identify the different types of information of the above healthcare system and describe how does **Strategic and Tactical** information help to fast growth of an Organization.	**[3]**	
	b)	Describe two **information-gathering techniques** you would use to understand the needs of doctors, patients, and administrators. How would you handle their **conflicting requirements**?	**[2]**	
2.	According to the above scenario (Question 1), draw a **context diagram** and a **level 1 DFD** to represent the automation of the telemedicine platform of RAY. Indicate: External entities, Processes. Data flows, Data stores.		**[7]**	**CO2**
3.	In the RAY telemedicine platform, when a patient tries to book a virtual consultation, the system must follow several decision rules. When a patient tries to book a consultation, the system first checks if the patient is logged in. If not, it displays a message asking them to log in. If the patient is logged in, the system then verifies whether their profile is complete. If the profile is incomplete, a prompt appears requesting profile completion before proceeding. Once the profile is complete, the system checks if the patient's National ID is verified. If the ID isn't verified, the system notifies the patient to complete the verification; otherwise, it moves on to the next step in the booking process. It then checks if the doctor is available at the selected time, and if the patient has a valid payment method. It further checks if the patient has not exceeded the weekly consultation limit (3 per week). If any of these condition fails, the system provides an appropriate message (e.g., "Doctor not available", "Payment method required", "Consultation limit exceeded," etc.). Finally, if all these conditions are met, the booking is confirmed.			**CO2**
	a)	Draw a **decision tree** to represent the logic for booking a consultation.	**[4]**	
	b)	Create a **decision table** from the logic built in the decision tree constructed in (a).	**[4]**	

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4.	Telemedicine System Investment for RAY: RAY, a healthcare startup, plans to launch a full-featured telemedicine system that supports video calls, secure patient records, online prescriptions, and a smart dashboard. The management is reviewing the financial feasibility of this investment. The projected **costs and benefits** are as follows: Investment Costs: Initial development cost: BDT 15,00,000 (one-time) Server and infrastructure: BDT 300,000 (one-time) Yearly maintenance: BDT 100,000 (recurring for 5 years) Estimated Annual Benefits: Increased revenue from virtual consultations: BDT 500,000/year (for 5 years) Cost savings (admin, paper, physical infrastructure): BDT 100,000/year Discount rate: 10%		**CO3**
	a) Calculate the payback period (PBP) — the time required to recover the initial investment.	**[2.5]**	
	b) Calculate the Net Present Value (NPV) of the project over 5 years. Use the given 10% discount rate. Show your formula and steps.	**[2.5]**	

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