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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Mid Examination, Spring 2025
Course Code: CSE321, Course Title: System Analysis and Design
Level: 3 Term: 2 Batch: 63

Time: 1.5 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.	**MetroLink** is a major public transportation system that operates metro trains in a busy metropolitan city. Currently, the ticketing system relies on manual ticket counters and outdated vending machines, causing long queues and delays for passengers. Additionally, there is no centralized system to track passenger flow, ticket validation, or travel history. The lack of real-time data makes it difficult to optimize train schedules and manage peak-hour congestion. MetroLink plans to implement an automated e-ticketing system that will allow passengers to purchase tickets online, use digital QR codes for validation, and track train occupancy in real time. As a system analyst, you are assigned to analyze the current issues and design an improved system.		
	a) Identify data and information in the context of the e-ticketing system for MetroLink. Explain how different stages of the System Development Life Cycle (SDLC) can be applied to improve ticket purchasing, passenger data tracking, and train schedule optimization.	[4]	CO1
	b) Illustrate the methods you would use to collect data on ticketing, passenger experience, and train scheduling. How would you ensure comprehensive data collection, considering the perspectives of passengers, ticketing staff, metro operators, and city planners?	[4]	CO2
	c) Assess the operational feasibility of implementing the e-ticketing system to enhance ticket purchasing and travel management. Analyze the technical feasibility of integrating mobile payments, QR-based ticket validation, and real-	[5]	CO3

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time train tracking.

2. The room allocation process in the XYZ Hostel Management System ensures that students are assigned rooms based on availability, priority, and specific conditions. The room allocation process in the Hostel Management System begins when a student submits a hostel application, selecting a preferred room type (single/shared) and specifying any special accommodation needs. The hostel administrator then checks room availability; if rooms are available, the process continues, but if not, the student is placed on a waiting list, prioritized based on academic performance and financial dues status. The finance department verifies the student's payment status, ensuring that all previous dues are cleared before proceeding with room allocation. Once eligibility is confirmed, rooms are assigned based on priority rules. After finalizing the room assignment, the system updates the Room Allocation Database and sends a confirmation notification via SMS and email to the student.

The hostel has the following room allocation policy. If a student is a first-year student and rooms are available in the general category, they get assigned a room; otherwise, they are placed on a waiting list. If a student is a senior (second year or above), they receive priority allocation only if they have paid the previous semester's dues; otherwise, they must clear their dues before being considered for a room. If a student requests a single room, they are assigned one only if it is available and their academic performance in the previous semester meets the required GPA threshold; otherwise, they are allocated a shared room. Additionally, students with disabilities are given the highest priority for single rooms regardless of academic performance or availability. If all rooms are full, students are placed on a waiting list, with priority determined based on academic performance and financial dues status.

CO2

a) Construct a Context Level Diagram and Level 1 DFD from the scenario. [6]

b) Prepare the decision tree for the above and Convert the decision table from the Decision Tree. [6]

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