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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Mid Term Examination, Fall 2025
Course Code: CSE227, Course Title: System Analysis and Design
Level: 2 Term: 2 Batch: 66

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.]

Currently, Hazrat Shahjalal International Airport in Dhaka struggles to cope with the high volumes of passengers, among which around 40% are migrant workers. A heavy manual immigration process leads to long queues, costly and ineffective data exchange, and high chances of fraud. To address these problems, the government plans to implement a **Digital Immigration Management System (DIMS)** designed to automate and integrate all processes for optimal efficiency and quality of service. **DIMS** will ensure secure data exchange between immigration officers, airline attendance, bank employees, and the Ministry of Expatriates' Welfare in real time and based on accurate information. For this purpose, the system will collect and process data on passenger arrivals and claims, queue densities, log activity of officers, and requirements for remittance. Major functions of the newly proposed system include spectacle biometric identification that uses National ID and passport information check for authors and limitations to travel online remittance verification attached to the bank system continual tracking of time and passengers using flights. At the same time, analytical information obtained from **DIMS'** operations will allow the government to monitor officer performance, detect fraud, and track migration scales to develop effective and secure overseas employment policies.

Now answer the following Questions

1.	a. Identify and explain the Key Information of the **DIMS** system that would be required from the above scenario for **DIMS** successful project. Explain how the identified information help in improving the efficiency of airport immigration operations.	**4.0**	**CO1**
	b. As a **System Analyst**, describe your **roles and responsibilities** in the implementation of the DIMS system.	**3.0**	
2.	**a.** Identify different sources of information and information-gathering techniques to collect data from each source for the **DIMS** system. Provide proper justification for each in the context of Hazrat Shahjalal International Airport.	**3.0**	**CO2**

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	b. According to the above scenario, draw a **Level 1** DFD to represent the automation **DIMS** of **Hazrat Shahjalal International Airport of Bangladesh.** Indicate all necessary External entities, Processes, Data Flows, Data Stores.	**4.0**	CO2
3.	In this **DIMS**, when a passenger arrives at the airport immigration desk, the system must follow several **decision rules** to approve or reject immigration clearance. The process is as follows: When a passenger's data is scanned, the system first checks if the **passport is valid**. If not, it rejects the clearance immediately. If valid, the system checks whether the **visa is valid.** If the visa is invalid or expired, clearance is denied. If both are valid, the system verifies the **biometric match** with the national ID database. If the biometric doesn't match, the system sends the case for **manual review**. Once biometric is verified, the system checks if the **passenger is on a travel restriction or watchlist**. If restricted, immigration is rejected. If not, it checks whether the **flight schedule is confirmed** and if **remittance documentation (for migrant workers)** is verified. If all conditions are met, **immigration is approved** automatically. Now		
	a. Draw a **Decision Tree** to represent the immigration clearance logic for DIMS. b. Construct a **Decision Table** from the decision tree developed in (a).	**6.0**	CO2
4.	*To implement the Digital Immigration Management System (DIMS), the Government of Bangladesh has proposed a seven-year investment plan that includes both one-time and recurring expenses.* The estimated financial requirements and benefits of the project are as follows. The **total investment costs** include a system development cost of **BDT 18,00,000** and biometric **hardware and infrastructure** costing **BDT 400,000**, both as one-time expenditures. In addition, the project will require an **annual maintenance cost** of **BDT 150,000** for seven consecutive years. The expected **annual benefits** consist of a reduction in processing time and manpower costs worth **BDT 400,000 per year** and improved remittance monitoring and **fraud detection contributing BDT 300,000 per year.** The **discount rate** for evaluating the project is assumed to be **10%.** a. Calculate the **Payback Period (PBP)** — the time required to recover the initial investment. b. Using a **10% discount rate**, calculate the **Net Present Value (NPV)** of the project **over 7 years**. Show the formula, step-by-step present value computation, and conclude whether the investment is financially achievable (positive or negative NPV).	**2.0** **3.0**	CO3