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Daffodil International University

Faculty of Science & Information Technology

Department of Computing and Information System

Final Examination, Spring-2026

Course Code: CIS221, Course Title: Information System Engineering

Level: 2 Term: 2

Exam Duration: 2 Hours **Marks: 40**

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.	**"Green Garden Restaurant" at Daffodil Smart City (DSC)** is a popular dining place that currently manages daily food orders, customer service, billing, and inventory of ingredients in its physical outlet. The restaurant now plans to develop an online food ordering system named **"Green Garden E-Food"**. The system aims to track online sales trends, customer preferences, inventory across dine-in and online orders, delivery performance, and marketing effectiveness, while ensuring secure online transactions and compliance with security standards. To develop the system, the restaurant hires a software company and follows a risk-driven, iterative development approach where each cycle includes planning, risk analysis, system design, development, and evaluation. After each cycle, the management reviews progress, provides feedback, and identifies and evaluates potential risks for the next phase. This continuous evaluation and improvement process helps refine the system step by step and ensures a secure, reliable final product.			**CLO1**
	a)	**Define** a System and mention its types.	**[2]**	
	a)	**Explain** how different types of information help the restaurant make better decisions for its e-commerce operations.	**[4]**	
	b)	**Describe** which SDLC model is suitable for developing the Green Garden E-Food system.	**[4]**	
2.	Biman Bangladesh Airlines uses the **"Airline Booking System"** to manage customer registration and handle both domestic and international flight ticket bookings. The system allows customers to search flights, book seats, and view their reservation details, while airline staff manage flight schedules and seat allocations efficiently. This system is designed around a relational structure that stores and organizes all operational data. The relational schema of the system is defined as follows: **Relational Schema:** • Customers (SSN, name, address, phone) • Flights (number, day, aircraft, type) • Bookings (SSN, number, day, row, seat) Now answer the following questions-			**CLO2**
	a)	**Design** a Use Case Diagram for the above mentioned "Airline Booking System".	**[5]**	

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	b)	**Sketch** an Entity–Relationship (ER) Diagram for the above mentioned relational schema.	[5]	
3.	Department of CIS is planning to develop an **"Online Course Registration System"** that allows students to create accounts, log in, browse available courses, check schedules, and register for courses based on prerequisites and seat availability through web and mobile platforms. Faculty members can manage course offerings, update course details, set prerequisites, and monitor enrolled students, while also handling special registration requests. Administrators can manage students, faculty, and courses, control registration periods, assign instructors, and generate reports on enrollment and course performance. The system must handle high traffic during peak registration times, ensure secure authentication, provide real-time updates on course availability, and maintain fast and reliable system performance.			**CLO3**
	a)	**List** the functional and non-functional requirements of the "Online Course Registration System".	[4]	
	b)	**Construct** a Data Flow Diagram (DFD) showing system processes and data flow for the given scenario.	[6]	
4.	Most of the banking systems in Bangladesh face increasing concerns regarding security and reliability, so Bangladesh Bank is developing a secure digital banking system to manage customer accounts, including account creation, fund transfers, loan applications, transaction history, and account statements. Users can access the system through secure login credentials. The system must ensure that financial data is protected from unauthorized access, remains accurate, and is always available for banking operations. In the early development phase, the project team performs risk identification to detect issues such as security threats, system failure under heavy load, data inconsistency, and unauthorized access using expert interviews, checklists, and past project analysis. Before deployment, the **System Quality Assurance (SQA)** team tests the system using functional and performance testing, prepares test cases, identifies defects, and generates reports. The SQA manager reviews the results, and developers fix the issues before final release.			**CLO4**
	a)	**Describe** why the CIA principle is important for information security.	[3]	
	b)	**Propose** suitable techniques for identifying potential risks in the above-mentioned scenario.	[4]	
	c)	**Suggest** how SQA factors can enhance system quality before system deployment.	[3]	