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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Final Semester Examination, Spring 2025

Course Code: CSE321, Course Title: System Analysis and Design

Level: 3 Term: 1 Batch: 63

Time: 2:00 Hrs **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. You have been assigned to design a "Smart University Management System" for a university that aims to digitize all academic and administrative processes. The system must handle student enrollment, course registration, faculty assignments, timetable scheduling, examination management, and automated result processing. Additionally, the system must support an online student portal for accessing academic records and a faculty portal for managing course materials and evaluations. It must also ensure data security, compliance with educational regulations, and role-based access control for students, faculty, and administrators. The system has the following tasks with specific requirements and timetable:

CO3

Task No.	Task	Requirements	Dependency	Duration
1	System Requirements Analysis	Gather functional and non-functional requirements, establish scope, and define key modules.	None	4 weeks
2	Student Enrollment & Verification	Collect student details, verify identity, and generate unique student IDs.	Follows Task No. 1	3 weeks
3	Course Registration & Faculty Assignment	Enable students to register for courses, assign faculty to courses based on availability.	Follows Task No. 2	4 weeks
4	Timetable Scheduling	Generate automated timetables based on faculty availability, student registrations, and room allocations.	Follows Task No. 3 & 6	3 weeks
5	Examination & Grading System	Manage exam scheduling, conduct online exams, and automate grading.	Follows Task No. 4 & 6	4 weeks
6	Database Implementati	Develop a secure database to store student records, academic history,	Follows Task No. 1	3 weeks

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	on	and faculty assignments.		
7	Online Student & Faculty Portals	Develop student and faculty portals to facilitate access to academic information and course management.	Follows Task No. 5 & 6	3 weeks
8	Automated Attendance System	Implement an automated attendance tracking system using biometric or RFID technology.	Follows Task No. 4 & 7	3 weeks
9	System Integration and Testing	Perform module-wise and end-to-end testing to ensure system reliability and compliance.	Follows Task No. 7& 8	4 weeks
10	Deployment and Training	Deploy the system, train faculty and administrators, and prepare user documentation.	Follows Task No. 9	3 weeks

	a) Construct a Gantt chart and activity network based on the information in the above scenario. b) Determine critical path and critical values of the activity network. c) Determine Early Start, Early finish, Late start and Late finish time of all activities. d) Determine slack time of these activities.	[6] [3] [4] [2]	
2.	a) Design a student enrollment form containing essential fields based on the scenario above. b) Develop manual test cases to validate course registration function from the scenario above based on faculty and timetable constraints.	[5] [5]	CO2
3.	A new online learning platform, "EduFlex," is being developed to offer digital courses for students worldwide. The platform must address security concerns such as unauthorized access, phishing attacks, data breaches, and Distributed Denial-of-Service (DDoS) attacks. Additionally, weak authentication mechanisms and improper encryption methods could expose sensitive student information. The system must implement strong security measures to prevent these threats and ensure a safe learning environment.		CO2
	a) Identify security vulnerabilities in the e-learning system and suggest protective measures focusing on network and data security. b) Discuss different types of cyber-attacks that could target an e-learning platform and propose strategies to mitigate them.	[5] [5]	
4.	Software Quality Assurance (SQA) is crucial in software development to ensure reliability, maintainability, and performance. Explain the key principles of Software Quality Assurance with various various SQA activities and mention how it differs from software testing.	[5]	CO3