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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Final Semester Examination, Summer 2025

Course Code:CSE 227 , Course Title: System Analysis and Design

Level:2 Term:3 Batch:65

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. The following tasks represent the development plan for a Smart Agriculture Monitoring System that collects sensor data, monitors soil and weather conditions, provides crop recommendations, and allows remote irrigation control. **CO3**

Activities/Tasks	Dependency	Time (Weeks)
A. System Planning	-	(2,3.5)
B. Requirement Gathering	A	(2,2,2)
C. Field Sensor Setup	A	(3,4,5)
D. Data Processing Module	B	(4,5,6)
E. Weather API Integration	C	(2,2,3)
F. Mobile App Design	B, C	(3,3,4)
G. System Testing	D, E, F	(2,3,4)
H. Feedback & Evaluation	G	(1,2,4)
I. Deployment	H	(2,2,4)
J. Staff Training	I	(1,1,2)
K. Final Review	J	(1,1,1)

(a)	**Apply** the given time sequence (time sequence: *o, r, p*) to calculate the estimated duration for all tasks in the project.	2
(b)	**Sketch** a Gantt Chart for the project timeline.	3
(c)	**Construct** a PERT Diagram with nodes and arrows showing task dependencies. Identify the Critical Path and total Project Duration.	6
(d)	**Show** tasks with slack time and determine which activities can be delayed without affecting the project deadline.	4

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2.		A university is developing an Integrated Resource Management System (IRMS) to handle both library and departmental inventory resources. The system should allow staff to input new resource details (e.g., books, lab equipment, or stationery) and enable real-time stock monitoring. Students should be able to reserve resources, such as books or lab kits. If the item is unavailable, the system must queue the student and notify them when it becomes available.		CO2
	(a)	**Analyze** the requirements for the IRMS and design a user-friendly input interface for staff to enter new resource details (e.g., item name, category, quantity, department, supplier, purchase date etc.). Also, **develop** an output interface that displays a real-time stock status report with low-stock alerts.	5	
	(b)	**Evaluate** the reservation functionality of the IRMS by **preparing** a detailed test case. Your test case should include the test input, expected output, and condition being tested.	5	
3.		A new online electronics store, TechKart, recently launched its e-commerce platform. Customers can browse products, make online payments, and track their orders. Within weeks, the platform experienced a phishing attack, where users were tricked into entering login credentials on a fake website. At the same time, the company plans to expand its business by introducing more product categories and improving its online visibility through digital marketing. **Analyze** the cyber threat described in the scenario and determine how phishing attacks compromise user data. **Evaluate** and recommend at least two preventive security measures TechKart should implement to strengthen its platform security.	5	CO2
4.		**Explain** the types of e-commerce models that can be applied to TechKart's operations based on the scenario in question no. 3, and **illustrate** with examples how each model fits the business context.	5	CO1
5.		A company is developing a mobile banking application that must meet high standards for reliability, security, usability, and performance. Since the app will handle sensitive financial transactions, the development team is required to follow a strict Software Quality Assurance (SQA) process. The project manager emphasizes that quality must be built into every phase of the software development life cycle to ensure the final product meets both user expectations and regulatory standards. **Examine** and identify the Quality Assurance (QA) factors that the company should adopt to improve security in the development of the mobile banking application. Explain how each factor contributes to meeting security requirements.	5	CO2