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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Final Examination, Spring 2026

Course Code: CSE227, Course Title: System Analysis and Design

Level: 2 Term: 2 Batch: 67

Time: 02:00 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.]

Suppose, you are opening, an online store that focuses on fashion products in the business that are sustainable and produced ethically, such as clothing, footwear, accessories, and home textiles, and targeted at environmentally conscious consumers. The site will have the following categories; men, women, shoes, bags, and home textiles, then further divided into dresses, tops, jackets, and eco-friendly fabrics. The products will display the name of the item, images, in-depth description of the material, eco-certifications, size, and price, and the customers will be able to filter products by their category, size, color, price range, and certification. To create an account, the customer has to provide the valid email address and the mobile number, password of at least eight characters with one capital letter, one small letter, one digit, and one special character, and high-value transactions demand two-factor authentication. The user is able to browse, add to the cart and make an order, where the system checks the availability of the product in real time. The accepted orders automatically create invoices that will contain any applicable discounts, shipping fees, and promotional offers and allow payments to be done through credit/debit cards, mobile banking system, or cash-on-delivery. The site will be equipped with seasonal discounts and package deals to influence returning customers and a feedback and rating system will enable users to give feedback. Inventory, management of category, and sales reports can be tracked by admins, which is why operations and customer satisfaction are smooth.

1.	*a)*	**Explain** how users of the proposed system may become victims of a phishing attack.	[3]	CO1
	b)	**Explain** the impact of Denial of Service (DoS) and spyware attacks on system's availability, user data security, and overall customer trust. Also, suggest suitable security measures to prevent these threats.	[4]	
2.	*a)*	**Design** the main browsing page with category filters, sorting options, cart functionality of the system interface. Include a sample invoice layout showing discounts, shipping charges, loyalty points, and promotions.	[7]	CO2
	b)	**Design** comprehensive test cases for the payment modules. Include positive, negative and boundary test cases. Explain how these tests ensure reliability, security, and user satisfaction.	[6]	

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3.	*a)*	The following table shows the time and dependency of the different activities for the above system. Based on this I. **Construct** a Gantt chart for the project. II. **Draw** the complete network diagram, clearly showing all dependencies. Label all nodes and activities properly. III. Determine the Critical Path and calculate the total project duration. Show all necessary calculations. IV. The client unexpectedly requests a change that adds 3 extra weeks to Activity, B and 1 extra weeks to C. Evaluate its impact on the Critical path, Total project duration, Slack distribution of affected tasks, whether project delay is avoidable or not. **Analyze** this and show calculation and reasoning.	[3] [5] [2] [5]	CO3

Task	Description	Dependency	Duration (Weeks)
A	Requirement analysis	None	2
B	stakeholder meeting	None	3
C	System design	A	2
D	architecture planning	B	4
E	Database design & setup	B	3
F	Front-end development (UI/UX)	D,E	2
G	Back-end development (logic & APIs)	C,F	2
H	Integration of front-end and back-end	F	3
I	User registration & authentication module	F,G,H	3
J	Product catalog and filter system	I	2
K	Shopping cart & order processing	H, I, J	2

4.		For the proposed system sustainable fashion marketplace, investors are planning a total one-time investment of **BDT 8,200,000**, which includes system development, cloud server infrastructure, initial inventory setup, and logistics support required to launch the platform. In addition, the project will incur annual maintenance and operational costs of **BDT 250,000** over the next six years to cover system updates, platform security, and customer support. The expected annual benefits, including revenue from online sales, subscription-based fashion boxes, loyalty program incentives, and operational efficiency improvements, are estimated at **BDT 1,050,000 per year.**		CO3
	a)	Calculate the Payback Period (PBP), the time required to recover the initial investment.	[2]	
	b)	Using a **6.5% discount rate, calculate** the **Net Present Value (NPV)** of the project over six years.	[3]	