Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Final Examination, Fall 2025

Course Code: CSE415, Course Title: Web Engineering

Level: 4 Term: 1 Batch: 63

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.]

1.		Byteflow, a growing logistics company, struggled as its large software system became slow and difficult to update across teams. New feature requests kept causing unexpected outages and delays. To regain control and improve flexibility, the company decided to shift toward a more modular system design, expecting both benefits and new trade-offs.		CO4
	a)	Based on the scenario, shortly **Explain** the three major challenges Byteflow is experiencing.	[3]	
	b)	**Demonstrate** how adopting a microservices-based approach can address these issues, and discuss its key benefits and trade-offs.	[5]	
2.	*a)*	You are given a base HTML file and two types of embedded objects: Icons and Thumbnails. The round-trip time (RTT) for each request is 75ms, and the base HTML file is small enough to fit within a single RTT. Each Icon requires 5ms to transmit, while each Thumbnail requires 3ms. The webpage contains 2 Icon objects and 3 Thumbnail objects. Using this information, calculate the total time required to load the entire page under three conditions: non-persistent HTTP, persistent HTTP, and persistent HTTP with pipelining.	[6]	CO1
3.		Mizan is the owner of "Mizaner Hotel," a small shop that sells hot meals at affordable prices to the working class. Each morning, he estimates how many meals he will need to prepare for the day and calculates the cost before buying fresh ingredients. Throughout the day, Mizan cooks the meals himself while regularly checking food stock to ensure ingredients do not run out or go to waste. The shop operates on a self-service system where customers collect clean plates, serve themselves, and pay at the counter. He employs a handful of workers only to clean dishes. During busy periods, he stays alert for possible disruptions, unexpected increase in customers, or delays in cleaning plates, and adjusts his actions to keep the shop running smoothly.		CO2
	a)	**Point out** the role of 'Models' while establishing connections with a database.	[2]	
	b)	Based on the given description, **Identify** possible activities Project Managers might share with Mizan in their own fields.	[4]	

4.		NextGrid is a renowned shop that sells computers, laptops, and related spare parts. They frequently celebrate special occasions with unique gift campaigns. For the upcoming Christmas through 31st December, they will run a promotion where one customer each day will win a brand-new laptop. The selection process works in a special way: whenever a customer buys products worth more than 10,000 taka, they will get a voucher with a unique ID with each purchase. Customers then submit this ID along with their details through an online form. Your task is to help NextGrid develop the required webpage along with the necessary backend operations to support this campaign.		CO3
	a)	**Develop** an HTML form that allows users to enter their personal details. The form should include fields for a unique voucher ID, full name, date the voucher was received, NID number, mobile number and requires acknowledgement of T&C's.	[5]	
	b)	**Write** a CSS rule that styles all input fields so that the text inside appears in blue, each input field has the background color yellow and padding of 10px.	[2]	
	c)	Then **Develop** a PHP program that iterates through the $_POST array and outputs all submitted NID numbers that are prime.	[4]	
	d)	After a successful submission, the provided data must be stored in a database named nextgrid_db, inside a table called campaign. **Show** the necessary PHP code to insert the submitted data into the database.	[4]	
	e)	Along with the daily winners, NextGrid will award a special prize to one customer at the end of the campaign. **Write** a PHP program that selects and displays the winner who has submitted the highest total number of entries. If multiple customers have the same highest number of entries, the customer whose earliest entry was submitted first should be selected. The program must display the winner's full name and mobile number in the following format: Congratulations **"FULL_NAME"**! You will be contacted via the number **"MOBILE_NUMBER"**.	[5]	