COMSATS University Islamabad
Abbottabad Campus

Department of Computer Science

MIDTERM EXAMINATION SPRING 2025

Class: BSE-BCS
Subject: Software Engineering
Total Time Allowed: 1.5 hours
Name: _____

Date: 7/05/2025
Instructor: Areej Bashir
Max Marks: 35
Registration #_____

SECTION-A

Answer the following questions. Each question carries equal marks.

1. Answer the following with example; **[CLO1]** (5)

   - Differentiate between Verification and Validation.
   - Differentiate between object-oriented and structural approaches.

2. Which SDLC Model should be applied to the given scenario, and explain with the help of a diagram? **[CLO1]** (5)

Spiral

A city government is developing a smart traffic management system that integrates real-time data from road sensors, surveillance cameras, and GPS to optimise traffic flow and reduce congestion. The system must also detect traffic violations and support emergency vehicle prioritization. However, the project faces several risks, including unreliable sensor data, potential AI decision-making errors, integration issues with existing infrastructure, and the possibility of system failure during peak hours. Since the solution will impact public safety and involve critical decision-making, it must be developed carefully with constant feedback, testing, and risk evaluation at every stage.

3. Identify the functional, non-functional, and domain requirements from the following scenario: **[CLO2]** (5)

A user logs into an online banking app using a secure OTP-based login to check their account balance and transfer funds to another account. Users must be restricted from transferring more than the regulatory daily limit (e.g., PKR 500,000/day) without additional verification. The system must respond within 2 seconds.

4. Answer the following

a. Make a usecase diagram from the given scenario: **[CLO2]** (12)

On an e-commerce website, users should create logins that allow customers to browse products, add them to their carts, and confirm orders. Customers can also view order history, track shipments, and update personal information. The admin manages the overall website, including product categories and user accounts, and handles customer support queries. Payment gateways handle transaction processing, and shipping companies handle product delivery.

b. Create a fully-dressed use case for *add to cart* usecase.

c. Make an activity diagram for the given scenario: **[CLO2]** (8)

In the online coffee shop, **a** customer visits the website by logging in. The customer then browses the menu, selecting the coffee or snack they want to purchase. After making a selection, the customer adds the items to their cart and proceeds to checkout. At checkout, the customer enters their delivery details and payment information. Once the payment is processed, the system confirms the order. The barista then prepares the order based on the request, and once the coffee is ready, the order is handed over to the delivery team. The delivery team then delivers the coffee to the customer's address. The customer receives the order, and the process concludes.

