COMSATS University Islamabad, Abbottabad Campus

Department of Computer Science

Reviewed 1.
AB 2/15/25.02.

Midterm Exam

SPRING 2025

Class: BSE 6A,6B AND 6C **Subject: Software Construction and Development**

Instructor: Hifza Ali **Total Marks: 40**

Date: 5th May 2025 **Name and Registration#**

CLO-1	Outline the concepts of software construction and management	Understanding
CLO-2	Illustrate best software construction practices	Applying
CLO-3	Demonstrate the concepts involved in development of concurrent programs.	Applying

Question No 1: [CLO-1] **Marks 10**

Discuss the essential Design Principles which must be followed to design "Coffee Bot Café" System keeping in view the non-functional requirements for the system are High Reusability and Modifiability with the Anticipation of Future Changes.

Question No 2: [CLO-2] **Marks 15**

"CoffeeBot Café" is a modern coffee shop that uses a smart **chatbot system** to enhance customer service. The chatbot helps customers place orders, suggest drinks based on preferences, handle payments, track loyalty points, and answer FAQs — all through an app or website interface. The chatbot allows customers to browse available coffee, tea, and snacks with descriptions and prices. The chatbot asks about size, milk type, sugar level, etc. The Customers place an order through the chatbot. The Chatbot confirms order, shows total cost, and asks for payment method. Customer may save favourite orders for future use. Based on customer history and time of day, chatbot recommends drinks. Customers earn points for each order. Chatbot notifies when points can be redeemed. Once the order is confirmed, the chatbot updates customer about preparation time and when it's ready for pickup. Payment is processed securely via integrated gateway. Options include credit card, wallet, and cash at counter. Chatbot handles common queries: hours, ingredients, allergens, etc. The Manager will add/update menu items. View order history, earnings, chatbot performance reports.

- Construct a level 0 DFD of the system and then Demonstrate a Object Oriented Solution for the System identifying the major system modules/classes, objects and methods. Give rationale for your design decisions based on the best practices discussed. **(3 + 10+ 2)**

Question No 3: [CLO-3] **Marks 15**

Consider a Concurrent Google Drive Server that handles multiple client requests in parallel. Some of the clients are successfully connected to the server and the others may get connect errors. For the said server elaborate the successful, failed connection establishment, service exchange and connection termination with the help of a flow chart.

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