B.Sc. Engg. CSE 4th Semester

07 April 2022

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

SEMESTER FINAL EXAMINATION **SUMMER SEMESTER, 2020-2021**

DURATION: 3 Hours **FULL MARKS: 100**

CSE 4407: System Analysis and Design

Programmable calculators are not allowed. Do not write anything on the question paper.
Answer **all 6 (Six)** questions. Marks of each question and corresponding CO and PO are written in the right margin.

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1. a) What does **"exploding"** mean in a data flow diagram? — 2 (CO1) (PO1)

b) What is a **context-level** data flow diagram? Discuss the differences between a **context-level** diagram and **level 0 DFD** (data flow diagram). — 4 (CO2) (PO2)

c) McDonuts, a famous donut place, wants to **install** a system to **record orders** for donuts and boba tea. When regular customers call McDonuts on the phone, they are asked for their phone number. When the number is typed into a computer, the name, address, and last order date is automatically brought up on the screen. Once the order is taken, the total, including tax and delivery, is calculated. Then the order is given to the cook. A receipt is printed. Occasionally, **special offers (coupons)** are printed so the customers can get a discount. Drivers who make deliveries give customers a copy of the receipt and a coupon (if any). Weekly totals are kept for comparison with last year's performance. — 4 + 6 (CO4) (PO3)

i. Design a context-level data flow diagram for McDonuts.
ii. Design another diagram showing all the major processes that should be present in the system.

2. a) Explain the concept of **UML**. What is the significance of **UML** in designing the structure of an object oriented system? — 4 (CO2) (PO1)

b) What are the three major elements of **UML**? List the diagrams included in structural and behavioral diagrams. — 6 (CO1) (PO1)

c) Woody's Supermarket, a small chain of grocery stores, is building a website to allow customers to place orders for groceries and other items they sell. When the customer places an order, the customer database is updated, and an order record is created. The order prints at a local store, and the goods are picked from the shelves by the store employees. Customers are sent an email notification that their order is ready. When they pick up the order, one of the employees hands them a receipt of the order received. Mr. Fuzz Lightyear, a friend of Mr. Woody, wants to learn more about the activities that a customer has to perform to buy any product from that website. Design an **activity diagram** for Mr. Fuzz Lightyear showing the customer using the website to place an order, verification of the order, order confirmation, order details sent to the local store, and a customer email sent to the customer. — 7 (CO4) (PO3)

3.	a)	Define the role of an actor in a Use Case diagram.	3 (CO1) (PO1)
	b)	Briefly explain the purpose of swimlanes in an activity diagram.	3 (CO1) (PO1)
	c)	Create a **use case diagram** that would illustrate the use cases for the following dentist office system: Whenever new patients are seen for the first time, they complete a patient information form that asks their name, address, phone number, and brief medical history, which is stored in the patient information file. When a patient calls to schedule a new appointment or change an existing appointment, the receptionist checks the appointment file for an available time. Once a good time is found for the patient, the appointment is scheduled. If the patient is a new patient, an incomplete entry is made in the patient file; the full information will be collected when the patient arrives for the appointment. Because appointments are often made far in advance, the receptionist usually mails a reminder postcard to each patient two weeks before his or her appointment.	11 (CO4) (PO3)
4.	a)	Explain how ***fit*** among the three HCI elements (human, computer, and tasks to be performed) leads to ***performance*** and ***well-being***?	3 (CO2) (PO2)
	b)	List three ways an analyst can improve a website interface design to help three types of person with disabilities, i.e., **visually impaired, hearing impaired**, or **mobility impaired**.	6 (CO1) (PO1)
	c)	An IT executive, Lian Yang, from Pied Piper Innovators, Inc., has asked you to design a graphical user interface for an executive desktop to help him in his work. Use icons for file cabinets, a wastebasket, a telephone, and so on. Show how they would appear on the computer display.	8 (CO4) (PO3)
5.	a)	Explain the concept of Six Sigma. Describe the steps of the Six Sigma methodology.	6 (CO2) (PO1)
	b)	Describe the structured walkthrough method to ensure the quality of a system.	4 (CO2) (PO1)
	c)	Briefly explain the different conversion strategies for converting an old system to a new one.	7 (CO4) (PO1)
6.	a)	List and discuss the seven phases of the system development life cycle (SDLC).	7 (CO2) (PO1)
	b)	Briefly explain the agile development methodology.	5 (CO1) (PO1)
	c)	When is break-even analysis useful?	4 (CO2) (PO2)