National University of Computer & Emerging Sciences, Karachi
Fall-2020 CS-Department
Mid-I Examination
22nd October 2020, 09:00 AM – 10:00 AM

Course Code:CS-324	**Course Name: Software Design and Analysis**
Instructor Name: Rubab Manzar/ Javeria Farooq/Ubaid Aftab/Romasha Khurshid	
Student Roll No:	**Section :**

Instructions:

- Return the question paper.
- Read each question completely before answering it. There are **2 questions and 2 pages**.
- All the answers must be solved according to the sequence number given in the paper.
- Be specific, to the point and no assumption should be made which contradict with any statement given in the question paper.

Time: 60 minutes. **Max Marks: 30 Marks**

Case Study1: Airline Reservation System

The following text describes the operations of the AirGreen airline reservation system. **[15 minutes]**

Because of the rapid spread of the internet, the airline adopted a reservation system that is a strong factor to gain new sales. This airline is introducing an online reservation system.
Airline reservation system incorporate flight schedules, passenger reservations and ticket records. User can book flight ticket by specifying the flight he wants to travel and he must also specify the place and date for his arrival and departure. The user can opt to choose the seat from an effective graphical user interface seating arrangement display. A user must be registered and have to log-in to reserve, confirm or cancel his ticket.

The user must use the email and password he provided during registration. Users can also view the flight schedule without logging in. An admin also needs to login to access the system to maintain flight schedule and to cancel and reserve the seats.
Due to pandemic i.e. COVID-19, the airlines made it mandatory to have a COVID detection test for every passenger, COVID test must be done 48 hours before your flight departure time. To ensure any fraudulent one copy of your test result will be sent to the airline reservation system from the hospital system directly, the seat reservation is dependent on test result if a passenger tested positive then there will be no reservation confirmed and if tested negative then seat reservation is confirmed and the customer gets the electronic ticket (e-ticket). The e-ticket is a digital record in the airline database. The passenger receives a confirmation by email with the receipt, which contain all the information about the purchase ticket. Users can pay either online or pay by cash.
To refrain from unwanted traffic and unauthorized use of bots introduced reCAPTCHA to the login screen of a system.

QUESTION NO.1: Requirement Analysis [15 marks, 30 minutes]

i. Identify all the system requirements from the above **Case Study1**. **[05 marks]**
ii. Draw the use case diagram for the above **Case Study1**. **[10 marks]**

Case Study2: Academic Record Management System

FAST maintains a record of all the students and offers courses. Well-defined syllabus is maintained for all the courses with a predefined list of subjects that are offered in each semester. Instructors in the FAST are assigned courses to teach according to the area that is specialized in and their availability. The students are allowed to take an exam for all the regular subjects offered in a specific semester. FAST prepares transcripts of the students based on the grades of all the subjects in which students appeared for the exam. Any student having greater than four backlogs in a year is detained and cannot appear for regular subjects in the next one year. There is a group of Course Administrators in the FAST to manage the courses including course content, assign courses to instructors and define the course schedule.

QUESTION NO.2: Design Analysis [15 marks, 30 minutes]

i. List down the steps of designing the conceptual model. **[3 Marks]**
ii. What are the criteria for distinguishing right classes? **[2 Marks]**
iii. Draw a class diagram for the **Case Study2**. **[10 Marks]**