National University of Computer and Emerging Sciences

Karachi Campus

Database Systems (CS2005)

Mid 2 Exam

Date: Monday, Nov 4th 2024

Course Instructor(s): Dr. Zulfiqar Ali Memon, Dr. Anam Qureshi, Ms. Javeria Farooq, Mr. Basit Ali, Ms. Atiya Jokhiyo, Ms. Abeer Gauher, Ms. Fizza Aqeel, Mr. Omer Qureshi, Ms. Zain Noreen, and Ms. Alina Arshad

Total Time (Hrs):	**1**
Total Marks:	**15**
Total Questions:	**3**

Do not write below this line

Attempt all the questions.

CLO # 3: Demonstrate an understanding of normalization theory to normalize the database and formulate, using SQL & relational algebra, solutions to a broad range of query & data problems.

Q1: [marks: 7] [Estimated Time: 28 minutes]

Table 01 stores information about software projects, their developers, and tasks assigned to each project. Each project can have many developers that are assigned tasks. It includes information on each task's status and deadlines in one single table.

P = Project Dev = Developer C = Client

Table 01: Details of Projects

P_ID	P_Name	Dev_ID	Dev_Name	Task_ID	Task_Details	Task_Status	C_Name	C_Email
1	Inventory Management	2001	Ali	T1	Design database	Completed	ABC Corp	client1@abccorp.com
		2002	Ahmed	T2	Develop API	In Progress		
		2003	Salman	T1	Design database	Completed		
2	Learning Management System	2001	Ali	T3	Create User Roles	In Progress	EduTech	client2@edutech.com
		2003	Salman	T4	Build Front End	Not Started		

1. Specify the insert, update, and delete anomalies, if any, for table 01. (2 marks)
2. Specify the primary key for the table 01. (1 mark)
3. Convert the table 01 up to 3NF by identifying the functional dependencies represented by the attributes. (3 marks)
4. Design a relational Schema for your 3NF relations and show the referential integrity constraints. (1 mark)

CLO # 2: Analyze an information storage problem and derive an information model expressed in the form of an entity relation diagram and other optional analysis forms, such as a data dictionary.

Q2: [mark: 1] [Estimated Time: 4 minutes]

Interpret the meaning of the min-max cardinalities (1, N) for Student and (0, N) for Course in a university database where students enroll in courses.

CLO # 2: Analyze an information storage problem and derive an information model expressed in the form of an entity relation diagram and other optional analysis forms, such as a data dictionary.

Q3: [marks: 7] [Estimated Time: 28 minutes]

Culinary Delight is a popular food delivery service that connects local eateries with hungry customers. In this vibrant ecosystem, each restaurant is run by a passionate owner who may oversee several eateries. Each restaurant offers a unique menu, with every dish carefully crafted and available exclusively at that restaurant.

Hungry customers can explore a diverse range of cuisines and place multiple orders, but each order must be linked to a specific customer. Within each order, customers can select a variety of dishes, and these dishes may be part of numerous orders from different customers.

Once an order is placed, a dedicated delivery person ensures the food reaches the customer promptly. Each delivery person has the capacity to handle multiple orders. After enjoying their meals, customers have the opportunity to provide the multiple feedback on each order, although each review corresponds to the single order.

1. Identify the entities from the scenario. (1 mark)
2. Define the attributes for each entity based on the specific requirements. (1 mark)
3. Determine the relationships between entities. (2 marks)
4. Draw the complete Entity Relationship Diagram (ERD). Clearly mention the structural constraints. (3 marks)

Good Luck!