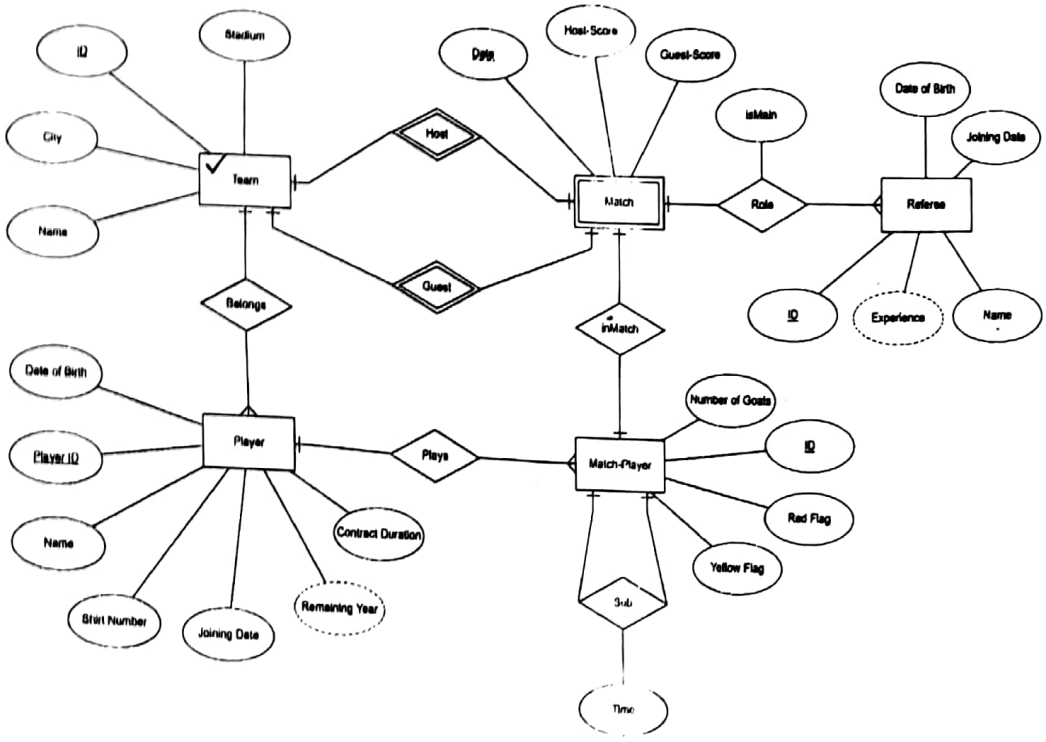
United International University (UIU)

Dept. of Computer Science & Engineering (CSE)

Midterm Exam, Trimester: Summer 2023
Course Code: CSE-3521 Course Title: Database Management Systems
Total Marks: 30 Duration: 1 hour 45 minutes

Any examinee found adopting unfair means will be expelled from the trimester / program as per UIU disciplinary rules.

1.	a) A well-known car rental company in Bangladesh named "SHEBA- Rent A Car" has made the decision to automate the entirety of their manual system in order to better serve their clients. The data specifications they gave to a software company are as follows: The Car Rental Company has several branches throughout Bangladesh. The information stored for each branch includes the branch's phone number, address, which consists of the road number, area, city, and zip code. Each branch is assigned a branch number, which is distinctive across the entire organization. There are several employees assigned to each branch, including a manager. The manager is in charge of overseeing the day-to-day operations of a specific branch. The information kept on a staff person includes their name, title, date of hire, pay, and experience. Within the organization, every employee has a distinct staff ID. Many rental cars are available at each branch. The brand name, model number, license plate number, category, daily rental cost, status, and the driver's name are among the information stored about a car. In a branch, there may be several cars of the same model. Cars are divided into categories as Private, Noah, Ambulance, Mini bus, etc. The status shows whether or not a car is available for rental. A customer must register with the company before renting a car. The first and last names, address, registration date, and branch name are the data that is stored on a customer. A unique customer id is provided to each customer. Customers who register can rent cars. The data stored on each rented car includes the rental number, the renter's name and phone number, the license plate number, and the date and time of the rental. The rental number is unique within the company. Now, design an ER diagram for the Scenario. b) Explain what you understand by the redundancy control property of the database management system for multiple use. Differentiate between candidate key and primary key.	7 2

2	a) Write the corresponding schema of the following ER diagram  b) Mention different kinds of mapping cardinalities and how they can be handled in schema? Explain Identifying Relationship Set and Non-Identifying Relationship Set.	5 3
3.	a) Consider the following schema Employees: [employee_id (primary key), name, age, department_id] Departments: [department_id (primary key), name, location] Projects: [project_id (primary key), name, start_date, end_date] Assignments: [assignment_id (primary key), employee_id, project_id] Customers: [customer_id (primary key), name, address, phone] Orders: [order_id (primary key), customer_id, project_id, order_date] Now write sql queries for the below i. Change the primary key of the orders table and declare order_id, customer_id and project_id together as a primary key. ii. Find out the project names where the duration of the project is not more than a year. iii. Find out the Employee names of those employees who aged less than the average age of all employees for each department. iv. Find out the name and address of each customer who has placed a project order and the project name is not starting with any vowel or not ending with "ea".	2*5 =10

	v. Find out the Employee name and assignment id of the 2nd first employee based on the number of assignments provided for that employee.	
4.	Consider the following relational database schema user(**user_id**, name,email, passward, gender) post(**post_id**, user_id(FK), content, likes) comment(**ID**, post_id(FK), user_id(FK), time, content) friend(**ID**, status), user id (FK)) Answer the following questions using relational algebra i. Find the post contents along with the user ID which post does not have any comment. ii. Get the details about all female users who have an ID in between 2 to 15. iii. Find the details of all users who have at least one friend and have more than 5 posts.	3