



# United International University (UIU)

## Dept. of Computer Science & Engineering (CSE)

Midterm Exam, Trimester: Fall 2023

Course Code: CSE-3521 Course Title: Database Management Systems Total

Marks: 30 Duration: 1 hour 45 minutes

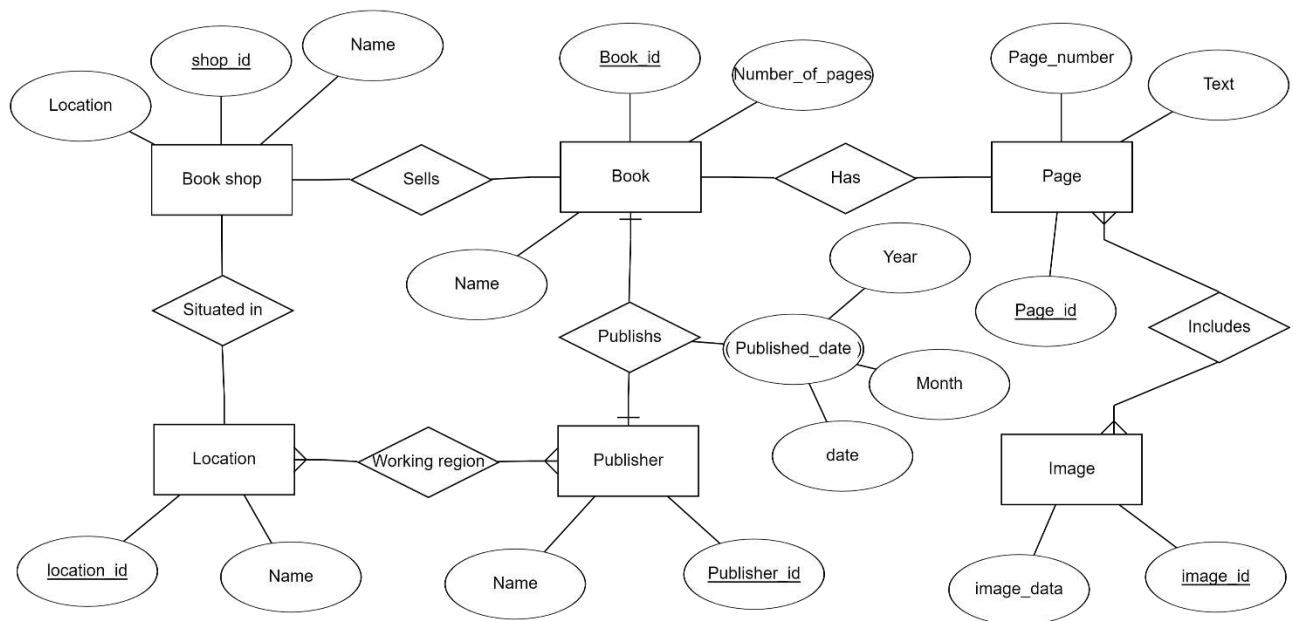
**Any examinee found adopting unfair means will be expelled from the trimester / program as per UIU disciplinary rules.**

1.	<p>a) Suppose you want to design a software system to manage Gym Membership of UIU. You tried to talk with the gym supervisor to find out the detailed information about gym management. The requirements are given below,</p> <p>The gym has a registration process for the students, faculties and staff of UIU. Users should be able to register for an account with their personal information, including name, ID, contact information, and a unique username and password. Registered users should be able to log in securely with their credentials. Gym trainers and administrators, should have additional privileges and access rights.</p> <p>The system should provide information about different membership plans, including their features, pricing, and duration (e.g., monthly, annual). No membership plan with the same type (regular or economic), price and duration are allowed to be set. However the same plan may have multiple working features in it. Prospective members should be able to view and compare the available plans before making a decision.</p> <p>Prospective gym members should be able to enroll in a specific membership plan. The system should handle the payment process for membership fees, with options for payment methods (e.g., credit card, cash).</p> <p>Members should be able to schedule fitness training sessions, one-on-one consultations with trainers. Staff members should be able to manage and confirm these appointments. The system should track member attendance, allowing staff to record check-ins and check-outs. The check in day and time should be unique for a specific member as no member is allowed to enter twice in the same day. Attendance records can help in assessing member engagement and plan utilization.</p> <p>Now, design an ER diagram for the Scenario.</p>	7
	<p>b) Explain the parts of the query processor in database system structure. “An identifying relationship between two entities is known as a strong relationship”, do you agree with this statement? If yes, justify your answer with proper explanation.</p>	2

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a) Write the corresponding schema of the following ER diagram.

5



3. Consider the following schema

**Teams Table:** [TeamID (Primary Key), TeamName, Captain, Coach, ICCRank]**Players Table:** [PlayerID (Primary Key), FirstName, LastName, DateOfBirth, Role (e.g., Batter, Bowler, All-Rounder, Wicketkeeper), TeamID (Foreign Key, referencing Teams Table)]**Matches Table:** [MatchID (Primary Key), Date, Venue, Result (e.g., Win, Loss, Tie, No Result), WinningTeam (Foreign Key, referencing Teams Table), LosingTeam (Foreign Key, referencing Teams Table) ]**Tournaments Table:** [ TournamentID (Primary Key), TournamentName, StartDate, EndDate, HostCountry ]**TournamentMatches Table:** [ TournamentMatchID (Primary Key), TournamentID (Foreign Key, referencing Tournaments Table), MatchID (Foreign Key, referencing Matches Table)]**PlayerPerformance Table:** [ PerformanceID (Primary Key), MatchID (Foreign Key, referencing Matches Table), PlayerID (Foreign Key, referencing Players Table), RunsScored, WicketsTaken, Catches, ManOfTheMatch (Yes/No)]

Now write sql queries for the below

- Retrieve the names of all cricket teams in the database.
- Retrieve the first names and last names of all players who have participated in matches against "Team England." Include the name of the opposing team in the result set.
- Find the total runs scored by each player in a match, along with their names, in which they scored more than 50 runs. Sort the results in descending order of runs.

1+2

2+2

	<p>iv. By using subquery, find the date, venue, and result of matches in which players from "Team Australia" took more than 5 wickets. For each match, list the player's name who achieved this and the number of wickets they took.</p> <p>b) Create the following tables.  Customers (<u>id</u>, name, email, phone number)  Products (<u>id</u>, name, price, category)  Orders (<u>id</u>, cust_id(fk), cart_id, date, total_amount)  Carts (<u>id</u>, product_id(fk), quantity)</p> <p>i. Create tables/entities mentioned above. (with the primary key &amp; foreign keys )  ii. Add an attribute 'address' to the Customers table.  iii. Remove 'id' from Customers table make 'email' the primary key. Show the necessary steps need to be taken sequentially with corresponding sql query.</p>	2+2+2
4.	<p>Consider the following relational database schema</p> <p>Suppliers (<u>sid</u> : integer, sname : string, address : string , area : string)  Parts (<u>pid</u> : integer, pname : string, color : string)  Catalog (<u>sid</u> : integer, <u>pid</u> : integer, cost : real(number), amount : integer )</p> <p>Answer the following questions using relational algebra</p> <p>i. Get the details about all "Parts" available in "Dhaka" area.  ii. Find the "Suppliers" (sid) who is selling "Green" coloured "Wool" and have more than 500 unit stock.  iii. Find the output for the following:  <math>\Pi (\text{amount, cost}) (\sigma (\text{pid} = (\Pi \text{pid} (\sigma (\text{color} = \text{'red'}) \text{parts}) ) \text{Catalog})</math></p> <p>[Just write a sentence what will the query find.  Example : All supplier with that sells red parts ]</p>	3