EER

Powered By

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1.

Question:01 [10]

A retail store chain wants to develop a database system to manage its inventory across multiple locations. The data requirements are outlined as follows:

Each product in the inventory has a unique ID,name, description, category, brand, price, and quantity on hand.

Products may belong to multiple categories (e.g., electronics, clothing, groceries) and may have different brands (you can add some names as per your wish).One product can be part of multiple categories at a time.

The inventory is spread across multiple store locations. Each store location has a unique ID, name, address, and contact information.

The stock of each product at each store location is tracked, including details such as the quantity available, reorder level, and supplier information.

Customers can make purchases at any store location. Each customer has a unique ID, name, contact information, and may be enrolled in a loyalty program.

Some customers may belong to different membership levels like Standard, Premium,Elite. It is not necessary for a customer to be part of any membership program.

The retail store may have partnerships with suppliers or vendors. Supplier information includes unique IDs, names, contact information, and product catalogs.

Based on these requirements, you can create an EER diagram for the retail store chain's inventory management system.

2.
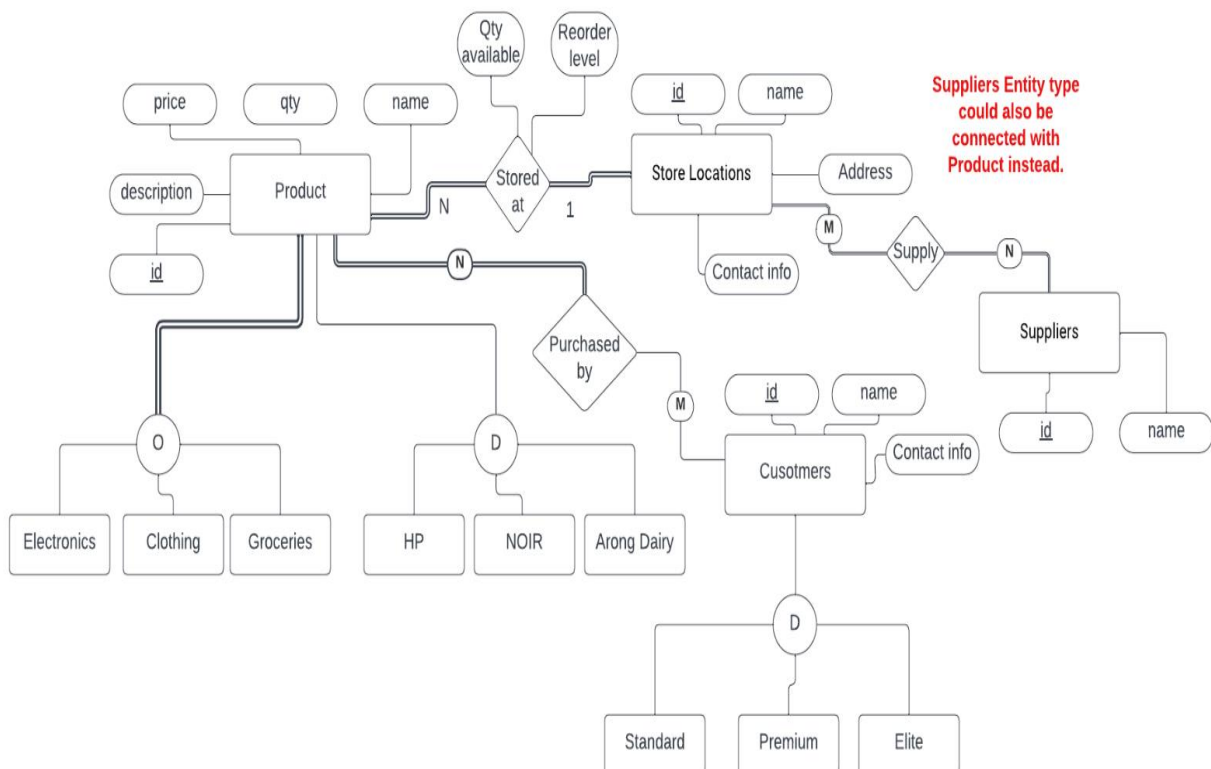
A hospital is planning to develop a database system to manage its patient records and medical staff. The requirements are outlined below:

Patients are admitted to the hospital for treatment. The database records their unique ID, name, date of birth, gender, and contact information.

Patients may be categorized based on their medical condition: Inpatient, Outpatient, Emergency. Inpatients have a room number, admission date, and expected discharge date. Emergency patients have details of their condition and treatment received.

Doctors and nurses work at the hospital. The database stores their unique ID, name, contact information, and specialization (e.g., cardiologist, pediatrician, nurse practitioner). A doctor can be specialized in multiple specialties.

Nurses are assigned to different wards or units within the hospital. Their shift schedule and assignment details are recorded. A nurse can supervise another nurse.

Patients may be assigned to specific doctors for treatment. Each assignment records the patient ID, doctor ID, start and end dates, and diagnosis/treatment details.

The hospital conducts Clinical research as well. The researches are of two types, one is theoretical research another is trial based. Mostly the doctors conduct the research. Only in trail based research ,patients can participate if they want to. The researches have unique IDs, titles, descriptions, start and end dates, associated researchers and the trial based research also stores associated patients.

Based on these requirements, you can create an EER diagram for the hospital's database system.
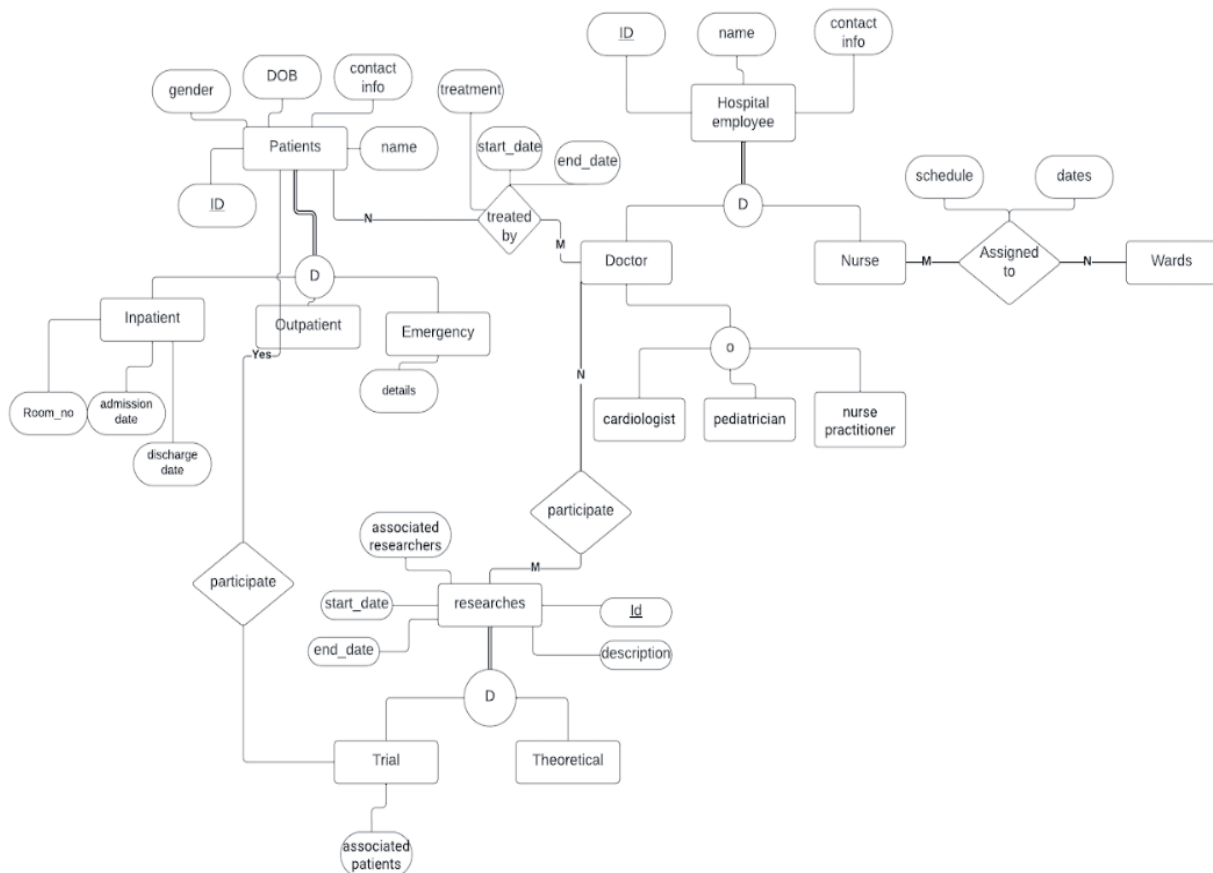
3.

Question 2 [CO2] : 10 Points

Design a database to keep track of information for an art museum. Assume that the following requirements were collected:

- The museum has a collection of ART_OBJECTS. Each ART_OBJECT has a unique Id_no, an Artist (if known), a Year (when it was created, if known), a Title, and a Description. The art objects are categorized in several ways, as discussed below.
- ART_OBJECTS are categorized based on their type. There are three main types—PAINTING, SCULPTURE, and STATUE—plus another type called OTHER to accommodate objects that do not fall into one of the three main types.
- A PAINTING has a Paint_type (oil, watercolor, etc.), material on which it is Drawn_on (paper, canvas, wood, etc.), and Style (modern, abstract, etc.).
- A SCULPTURE or a statue has a Material from which it was created (wood, stone, etc.), Height, Weight, and Style.
- An art object in the OTHER category has a Type (print, photo, etc.) and Style. ● ART_OBJECTs are categorized as either PERMANENT_COLLECTION (objects that are owned by the museum) and BORROWED. Information captured about objects in the PERMANENT_COLLECTION includes Date_acquired, Status (on display, on loan, or stored), and Cost. Information captured about BORROWED objects includes the Collection from which it was borrowed, Date_borrowed, and Date_returned.
- Information describing the country or culture of Origin (Italian, Egyptian, American, Indian, and so forth) and Epoch (Renaissance, Modern, Ancient, and so forth) is captured for each ART_OBJECT.
- The museum keeps track of ARTIST information, if known: Name, DateBorn (if known), Date_died (if not living), Country_of_origin, Epoch, Main_style, and Description. The Name is assumed to be unique.
- Different EXHIBITIONS occur, each having a Name, Start_date, and End_date. EXHIBITIONS are related to all the art objects that were on display during the exhibition.
- Information is kept on other COLLECTIONS with which the museum interacts; this information includes Name (unique), Type (museum, personal, etc.), Description, Address, Phone, and current Contact_person.

Draw an EER schema diagram for this application. Discuss any assumptions you make, and then justify your EER design choices.

Question 2 Answer:

Art Museum EER Diagram
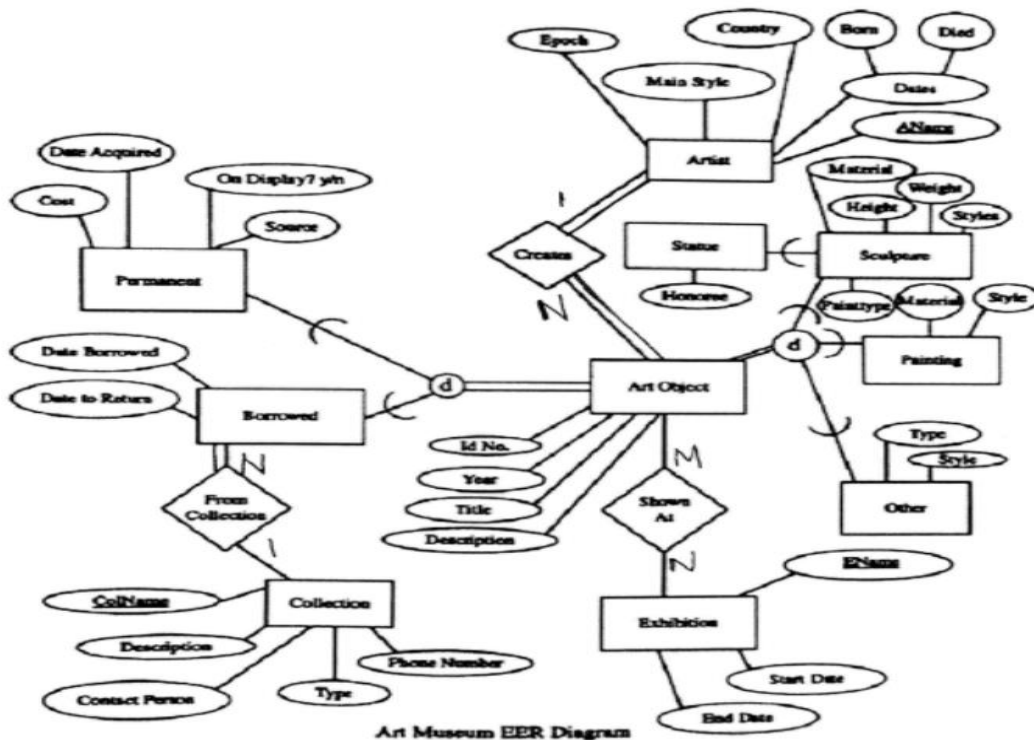
4.

## Question 2 :   [10 points]

Design an EER diagram for a Cricket World Cup management system. The database should contain information about different cricket tournaments, teams, players, matches, match statistics, umpires, and any other important aspects of cricket tournaments.

In your EER diagram, you have the freedom to design entities, attributes, and relationships as you see fit, while adhering to the following constraints:

- There should be at least one disjoint-partial specialization/generalization.
- There should be at least four regular/strong entities (excluding subclasses).
- There must be at least one recursive relationship.
- There must be at least one M:N relationship.
- There must be at least one 1:N relationship.
- There must be at least one weak entity.

Show all important attributes, entities, and relationships in order to represent a clear and complete scenario. The EER diagram should be logically accurate and realistic, representing the database of the given scenario.
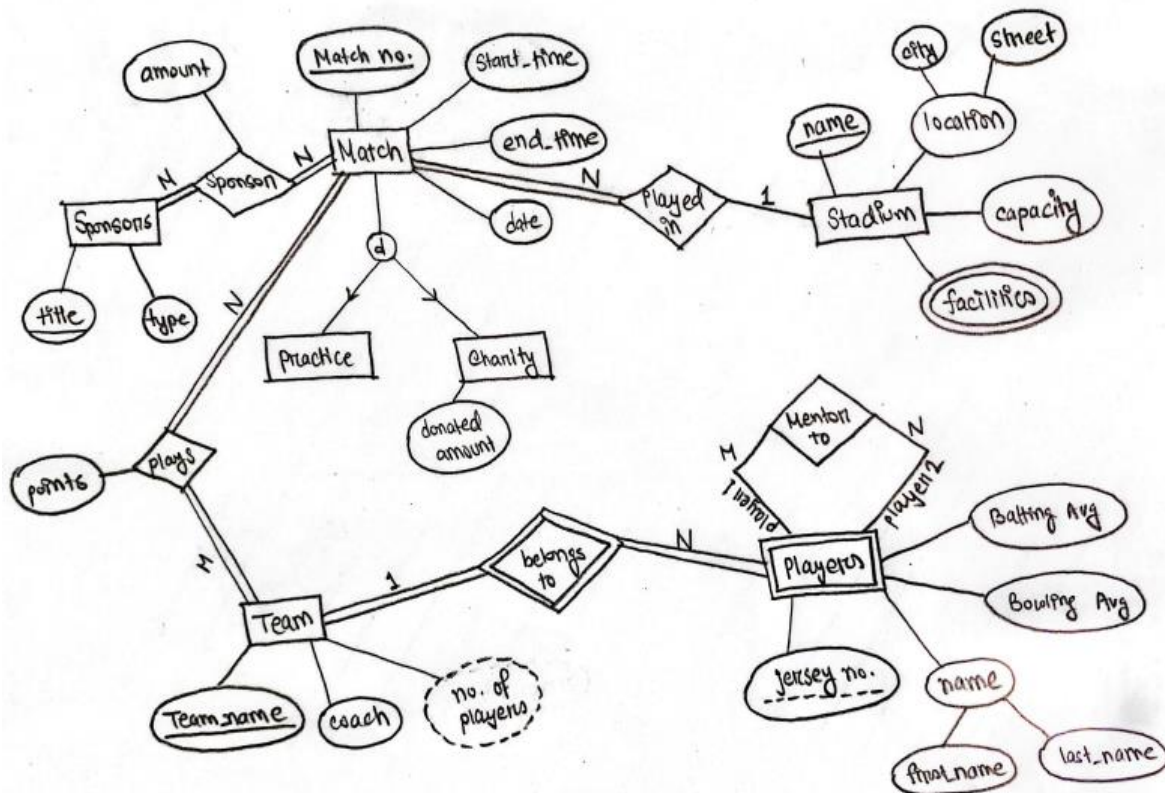
5.

Question 2 [10 Marks]

Given the scenario below, construct an EER diagram for the library management system at ABC University:

   a. Members have a unique ID, name, joining date, phone number and an email address.

   b. Members have to be either a faculty member or student or they can be both. Students have a CGPA attribute, faculty members have a courses taught attribute. Faculty members may have taught several courses and a course is composed of course code and title.

   c. Books have a unique ISBN, title, multiple authors, publisher, publication date, edition. A book can be a sequel to another book.

   d. Each book has several Book Copies. The copy number, date purchased and shelf number is stored. Note that for each book the copy numbers are 1, 2 and so on. Shelf number and date purchased can be the same for different books.

   e. Members can borrow book copies. The borrowed date, return date, due date and late fees are recorded. The late fees can be calculated using the return date and due date, so it should not be stored, but shown using an appropriate symbol.

2,
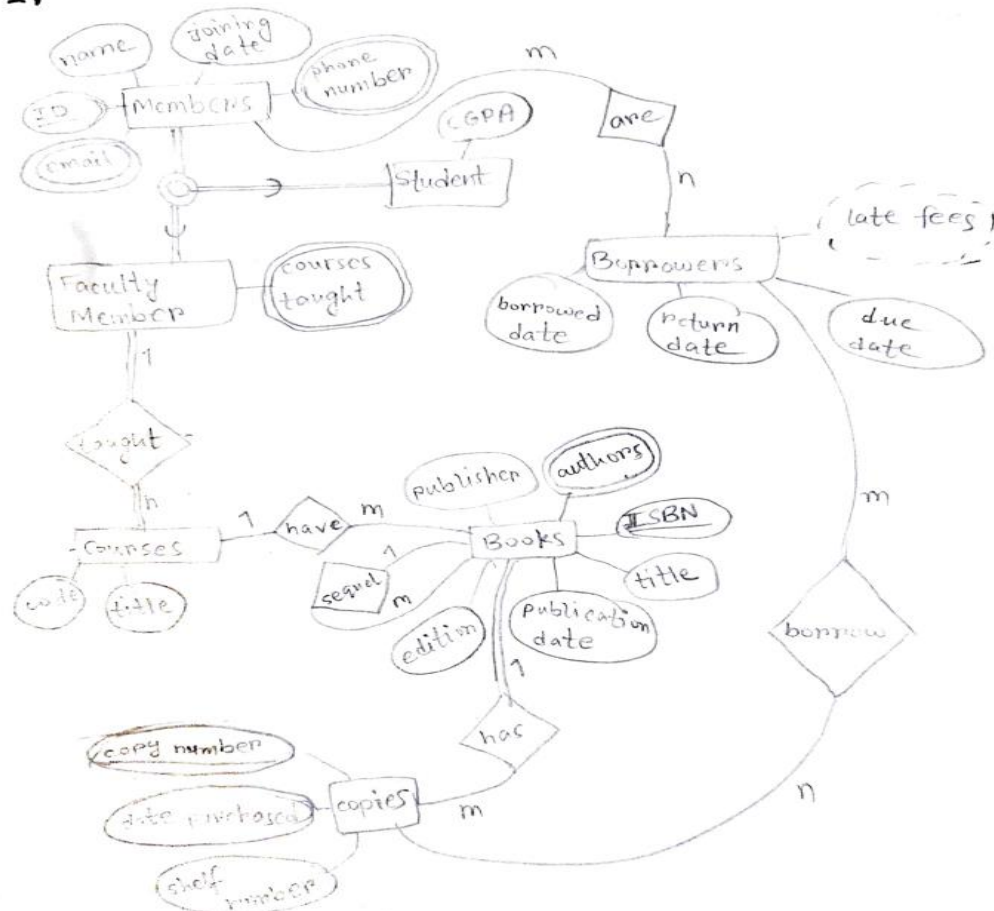
6.

Design an EER diagram for the University Sports Club. The sports club uses a database system to keep track of its members, advisors, club departments, different sports activities and their results and other club related events.

You can design your EER as you wish, but it must satisfy the following constraints:
   a. there should be at least one disjoint-total specialization/generalization,
   b. there should be at least four regular entities (excluding the subclasses),
   c. there must be at least one recursive relationship,
   d. there must be at least one M:N relationship.

Show the important attributes of all the entities and any relationships required. The EER diagram should be clear and realistic, representing the database of the given scenario.

7.
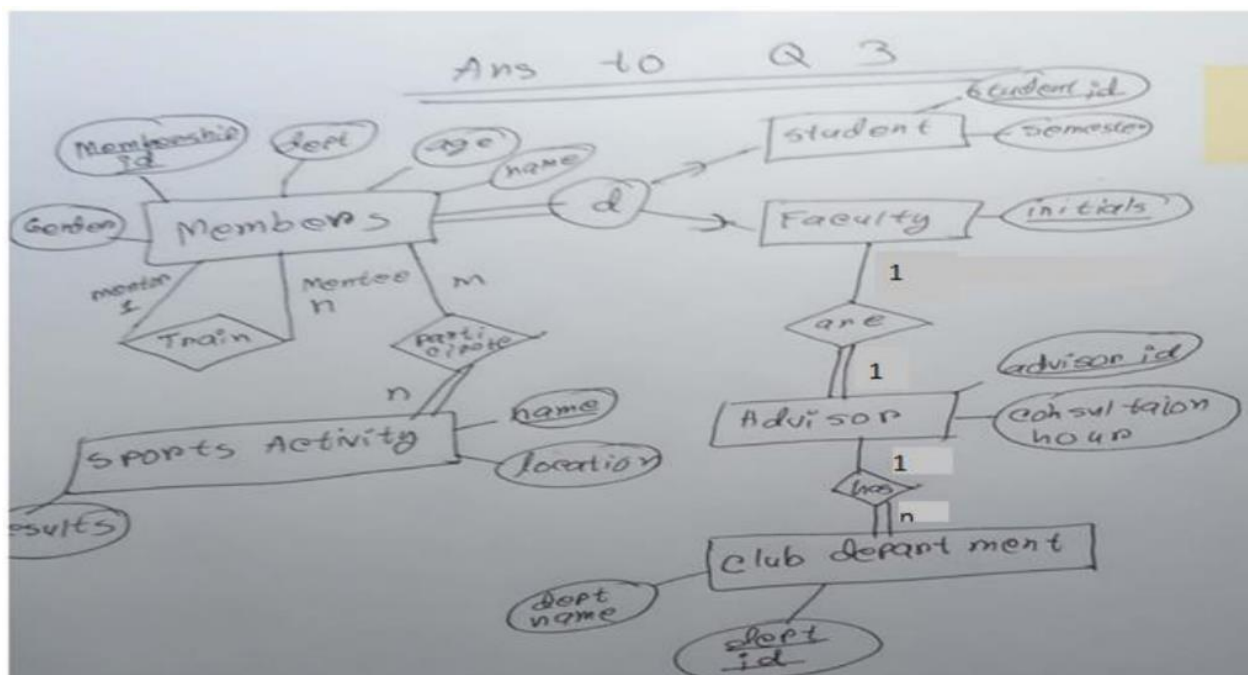
Design an EER Diagram for a hotel management system. You have to assume all entities, attributes and relationships. No need to write any assumptions as long as the diagram is clear and realistic. Your diagram should fulfil the following conditions

1. There should be at least one overlapping-partial specialization. [2 points]

2. There should be at least 5 entities [1 point]

3. There should be at least one 1:M and one M:N relationship [2 points]

4. There should be at least one composite attribute and 1 multivalued attribute[2 points]

5. There should be at least one recursive relationship [1 point]

Your EER needs to be logical, complete and should reflect a real world scenario [2 points]

8.
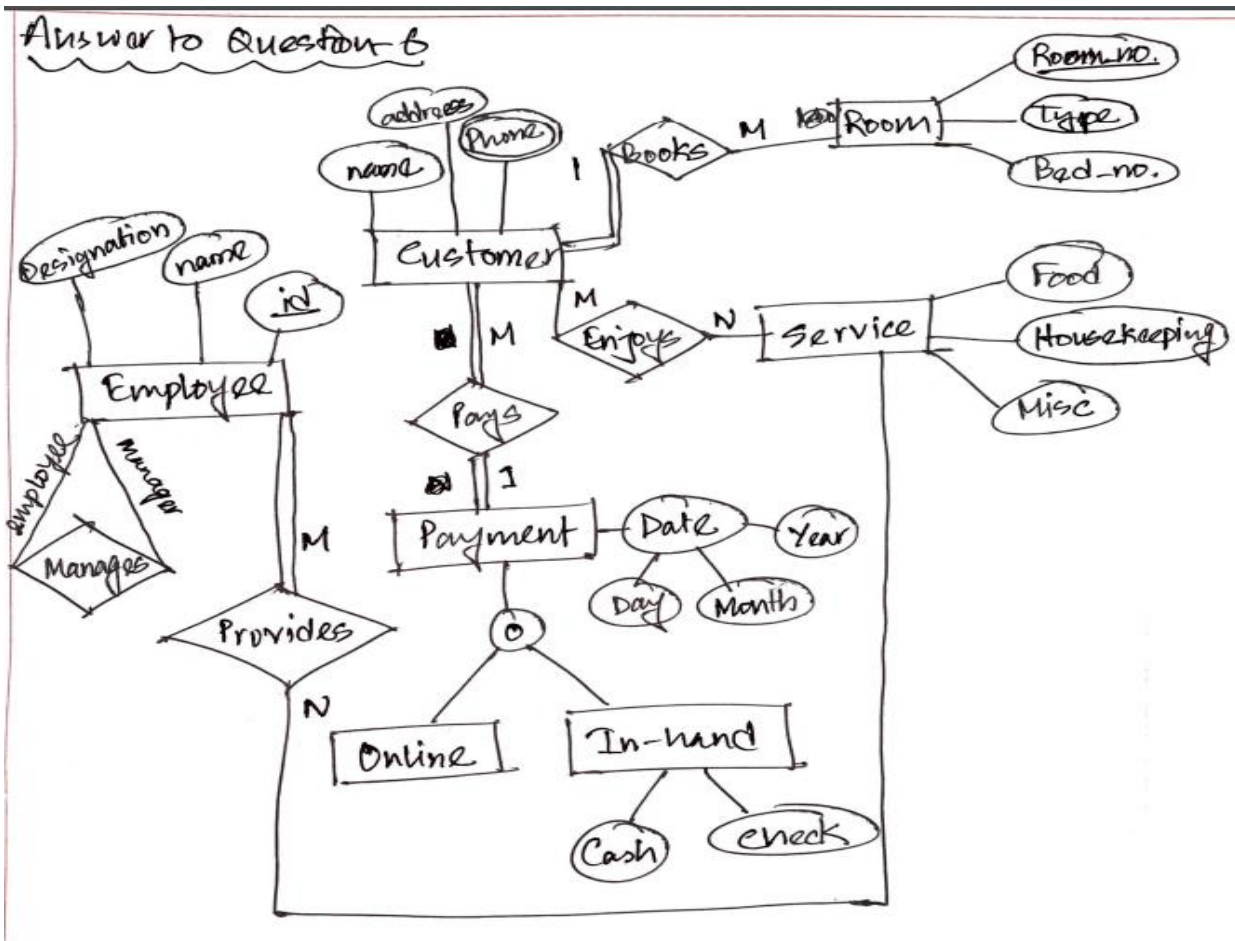
BRACU Film club is creating a database to keep track of their members and events. You have to design an EER diagram according to the requirements given below:

1. Members in the club have name, student_id (unique), birthdate, semester, department and phone number stored. Birthdates have year, month, day [1 point]

2. Members can be categorized into President, Director, Secretary or Executive roles. One member can belong to only one role. Presidents have a start_date. Executives may have multiple skills. Members must have one of the roles mentioned above.   [2 points]

3. Each member must be assigned to a single department. The departments have department_id (unique), name and description. [2 points]

4. The club has many Events. The Event_Date (Unique), name, budget is recorded. [1 points]

5. Events have many Activities. The Activities have only the following attributes: name, budget_percentage and priority_level. Name of activity is a partial key. [2 points]

6. Some members are assigned to different activities. The task_description of each member for each activity is also recorded [2 points]

Draw an EER diagram that represents the information above.
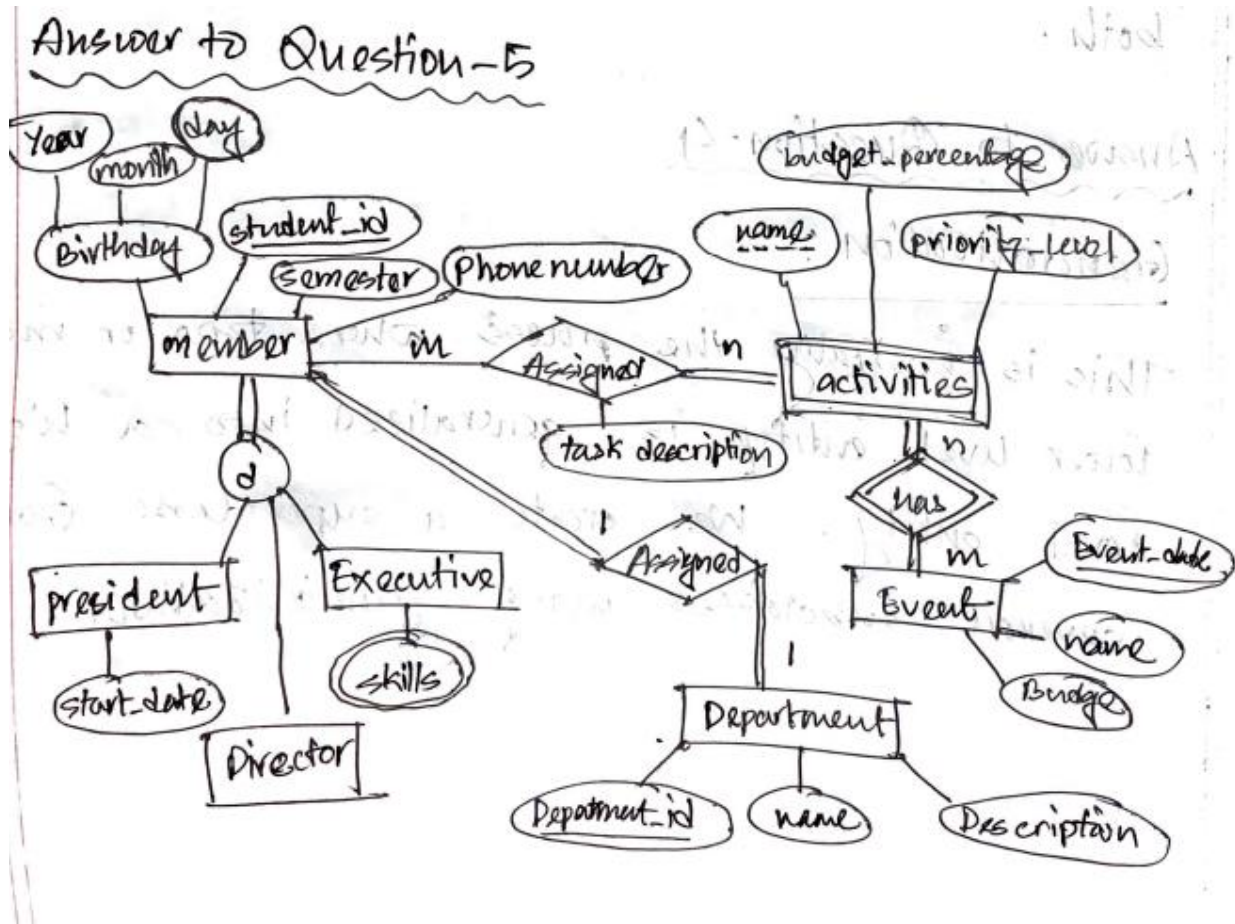
9.

Draw an EER diagram for a Bangla movie database- that keeps tracks of movies, actors, directors, music in movies, ratings, production house etc. You have to design the EER by yourself and assume all entities, relationships and attributes. The EER diagram should be realistic, logical and should represent the database of the given scenario. The diagram should also satisfy the following conditions:

a. One entity specialization which satisfies disjoint and partial participation constraints. [2 points]

b. Your EER diagram must have at least five entities. [2 points]

c. There must be a recursive relationship. [2 points]

d. There must be at least one 1:N relationship. [2 points]

Show the important attributes of all the entities and any relationships required. The EER diagram should be realistic and logical. [2 points]

DO NOT try to copy from online questions, youtube or from classmates. If any TWO students have same design it will be considered plagiarism.

10.

Question 2:

Design a database schema for a "Programming Competition Management System". The system should facilitate the management of participants, judges, problems, solution submissions, and contest organizers. [8 points]

In your EER diagram, you have the creative freedom to design entities, attributes, and relationships as you see fit, while adhering to the following constraints:

- *Include at least one disjoint-total specialization/generalization.*
- Include at least one overlapping-partial specialization/generalization.
- Incorporate a minimum of four regular/strong entities (excluding subclasses).
- Implement at least one recursive relationship.
- Integrate at least one Many-to-Many (M:N) relationship.
- Include at least one One-to-Many (1:N) relationship.
- Incorporate at least one weak entity.

Ensure that your EER diagram is logically accurate, vividly realistic, and comprehensive, effectively representing the database required for a Programming Competition Management System.

11.

Question 2:

Design a database schema for a real estate management system. The system should facilitate the management of properties, owners, tenants, transactions, and agents involved in property transactions. [8 points]

In your EER diagram, you have the creative freedom to design entities, attributes, and relationships as you see fit, while adhering to the following constraints:

- *Include at least one disjoint-total specialization/generalization.*
- Include at least one overlapping-partial specialization/generalization.
- Incorporate a minimum of four regular/strong entities (excluding subclasses).
- Implement at least one recursive relationship.
- Integrate at least one Many-to-Many (M:N) relationship.
- Include at least one One-to-Many (1:N) relationship.
- Incorporate at least one weak entity.

Ensure that your EER diagram is logically accurate, vividly realistic, and comprehensive, effectively representing the database required for a real estate management system.

12.

Question 2:

Design an Enhanced Entity-Relationship (EER) diagram for an "Online Music Streaming Platform." The database should encompass various elements related to music streaming services, including songs, artists, users, playlists, genres, and any other relevant components. [10 points]

In your EER diagram, you have the creative freedom to design entities, attributes, and relationships as you see fit, while adhering to the following constraints:

- *Include at least one disjoint-total specialization/generalization.*
- Include at least one overlapping-partial specialization/generalization.
- Incorporate a minimum of four regular/strong entities (excluding subclasses).
- Implement at least one recursive relationship.
- Integrate at least one Many-to-Many (M:N) relationship.
- Include at least one One-to-Many (1:N) relationship.
- Incorporate at least one weak entity.

Ensure that your EER diagram is logically accurate, vividly realistic, and comprehensive, effectively representing the database required for an Online Music Streaming Platform.

13.

Question 2:

Let's consider the scenario of designing an Enhanced Entity-Relationship (EER) diagram for an "Online Retail Platform." Your database should encompass various elements related to products, customers, orders, vendors, categories, and any other relevant components. [8 points]

In your EER diagram, you have the creative freedom to design entities, attributes, and relationships as you see fit, while adhering to the following constraints:

- *Include at least one disjoint-total specialization/generalization.*
- Include at least one overlapping-partial specialization/generalization.
- Incorporate a minimum of four regular/strong entities (excluding subclasses).
- Implement at least one recursive relationship.
- Integrate at least one Many-to-Many (M:N) relationship.
- Include at least one One-to-Many (1:N) relationship.
- Incorporate at least one weak entity.

Ensure that your EER diagram is logically accurate, vividly realistic, and comprehensive, effectively representing the database required for an **Online Retail Platform** Platform.
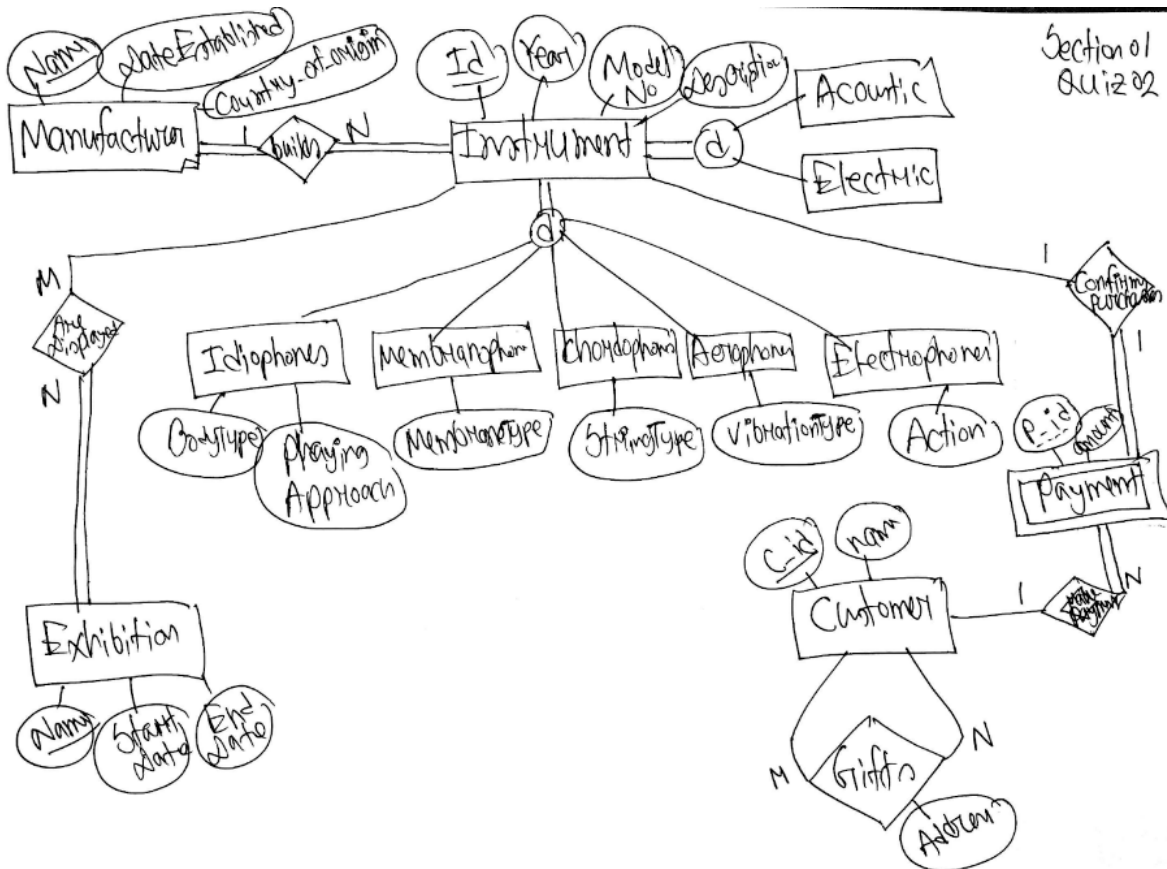
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14.

Question 1 [C02] : 8 Points

Design a database to keep track of information for a Musical Instrument Shop. Assume that the following requirements were collected:

- The shop has a collection of Instruments. Each Instrument has a unique ID, a Year, a Model No, and a Description. The musical instruments are categorized in several ways, as discussed below.
- Instruments are categorized based on their type. There are five types—Idiophones, Membranophones, Chordophones, Aerophones and Electrophones.
- An Idiophone has a BodyType and PlayingApproach attribute. A Membranophone has a MembraneType attribute. A Chordophone has a StringType attribute. An Aerophone has a VibrationType attribute. An Electrophone has an Action attribute.
- An Instrument can also be either Acoustic or Electric.
- Manufacturers build Instruments. The shop keeps track of Manufacturers information, Name, DateEstablished, Country_of_origin. The Name is assumed to be unique.
- The shop arranges Exhibitions to occur, each having a Name, Start_date, and End_date. Exhibitions are related to all the Instruments that were on display during the exhibition.
- To purchase instruments, a Customer needs to make Payment. Payment confirms purchases of a Customer.
- A Customer can gift an instrument to other Customers. In that case, the address of the ones who will receive the gift is recorded.

Draw an EER diagram for this application. There must be a weak entity, at least one relationship attribute, at least one m:n relationship and at least one recursive relationship. Discuss any assumptions you make, and then justify your EER design choices (if required).

15.

Question 1 [C02] : 8 Points

Design a database to keep track of information for a Digital Product Shop. Assume that the following requirements were collected:

- The shop has a collection of Products. Each Product has a unique ID, a Manufacturer, a Year and a Description.
- Products are categorized based on their type. There are five types—Ebooks, Softwares, Web Applications, Digital Art, Templates.
- An Ebook has a Page attribute. A Software has a LicenseDuration attribute. A Web Application has a Feature attribute. A Digital Art has a Type attribute. A Template has a Feature attribute.
- Software can be categorized as Application and System.
- Seller sells Products. The shop keeps track of Seller information, SellerID, Name, DateJoined, Country_of_origin. The SellerID is assumed to be unique.
- The shop arranges Digital Fairs, each having a Name, Start_date, and End_date. Digital Fairs are related to all the Products that were on display during the fair.
- To purchase products, a Buyer needs to make Payment. Payment confirms purchases of a Buyer.
- A Buyer can gift a product to other Buyers. In that case, the information of the ones who will receive the gift is recorded.

Draw an EER diagram for this application. There must be a weak entity, at least one relationship attribute, at least one 1:n relationship and at least one recursive relationship. Discuss any assumptions you make, and then justify your EER design choices (if required).