



Q1) Define the following terms: superclass of a subclass, superclass/subclass relationship, specialization, generalization, data warehouse, Temporal databases, spatial database and category. (8 point)

Q2) Draw an EER schema diagram for this art museum. Assume that the following requirements were collected: (12 points)

- 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.

Q3) (20 points)

A) Consider the following bank database schema:

branch (branch name, branch city, assets)

customer (customer name, customer street, customer city)

loan (loan number, branch name, amount)

borrower (customer name, loan number)

account (account number, branch name, balance)

depositor (customer name, account number)

Write an SQL trigger to carry out the following action: On delete of an account, for each owner of the account, check if the owner has any remaining accounts, and if she does not, delete her from the depositor relation. (5 points)

B) Consider an employee database with two relations

employee (employee name, *street*, *city*)

works (employee name, company name, *salary*)

where the primary keys are underlined. Write a query to find companies whose employees earn a higher salary, on average, than the average salary at "First Bank Corporation". (5 points)

C) Consider the relational schema

part (part id, *name*, *cost*)

subpart (part id, subpart id, *count*)

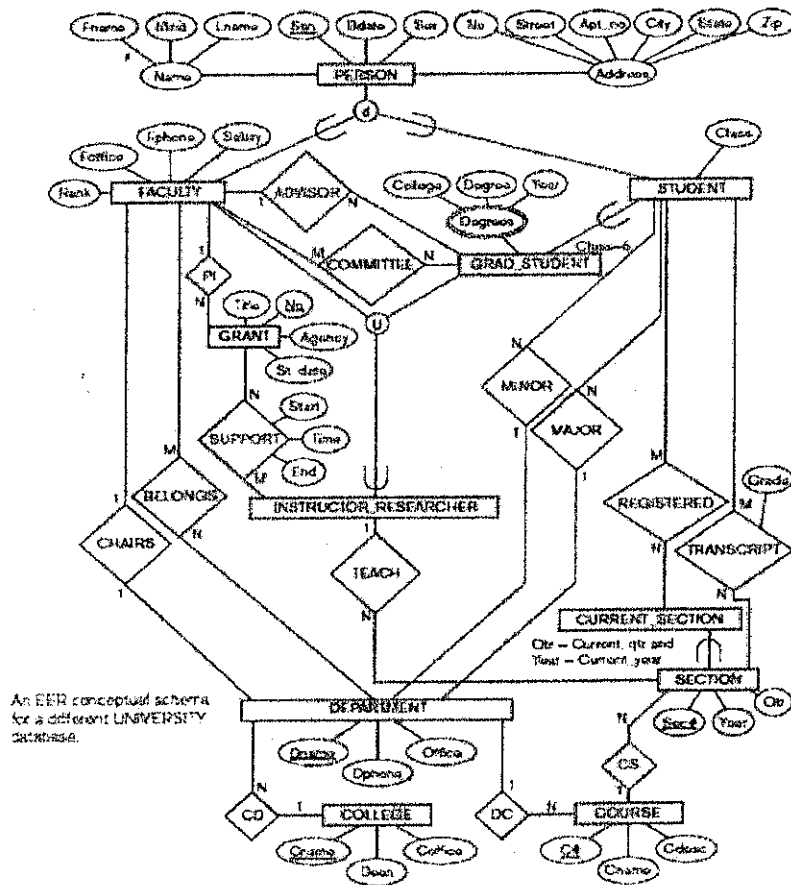
A tuple (p1, p2, 3) in the subpart relation denotes that the part with part-id p2 is a direct subpart of the part with part-id p1, and p1 has 3 copies of p2. Note that p2 may itself have further subparts. Write a recursive SQL query that outputs the names of all subparts of the part with part-id "P-100". (5 points)

D) Consider the relational schema:

Instructor (Instructor name, *address*, *city*, *dept name*)

Create a SQL function that, given the name of a department, returns the count of the number of instructors in that department. And then use that function in a query that returns names of all departments with more than 12 instructors. (5 points)

Q5) Map the EER diagrams in the following figures into relational schemas: (20 points)



With My Best wishes
Dr. Ahmed Elashry



Question 1:

[1.1] Define Web Information System? List three example of WIS?

[1.2] Draw the block diagram of Architecture for Web-IS? Write a short note about each part of diagram?

[1.3] list and classify the main Core Technologies used in WIS?

[1.4] List and write a short note about Server Components

Question 2:

[2.1] List and write a short note about Client-side Web Technologies

[2.2] How does CGI at work? List CGI Advantages and Disadvantages

[2.3] What is ASP?

[2.4] What are server-side includes (SSI)? Why use SSI?

Question 3: Choose the correct answer

1- in Web-IS architecture the layer that responsible for interacting with application logic components is

- a) Presentation layer
- b) application layer
- c) resource management layer

2- The server component that caches results (HTML documents, images) of an HTTP request to improve response time for static information requests is

- a) DB-Server
- b) Communication-Server
- c) Proxy-Server

3- which of the following is not Server-side technology.

- a) CGI
- b) AJAX
- c) SSI

4- in what technology the user perceives web application as faster, due to asynchronous loading of data.

- a) AJAX
- b) ASP
- c) HTML

5- Can include COM/ActiveX components and/or compiled code.

- a) PHP
- b) ASP
- c) CGI

6- which one of the following can not be a Client of the servlet

- a) Browser
- b) Applet
- c) Servlet

with my best wishes Dr: Reda M. Hussien