Kafrelsheikh University
Faculty of Engineering
Electrical Engineering Dept.
Subject: DatabaseMangement Systems
(Full Mark: 90 Marks)

2nd Year Students
(2007 modified)
Final Exam
Date: 15/1/ 2018
Time Allowed : 3 hours

The course code: ECS2108	This course intend the following iLOS according to (NARS 2009): a (4, 5, 7, 8, 11) - b (2, 3, 8, 9, 12) - c (3, 9) - d (2, 6, 7, 8)

Answer the following *Four* question:(*In two Pages*)

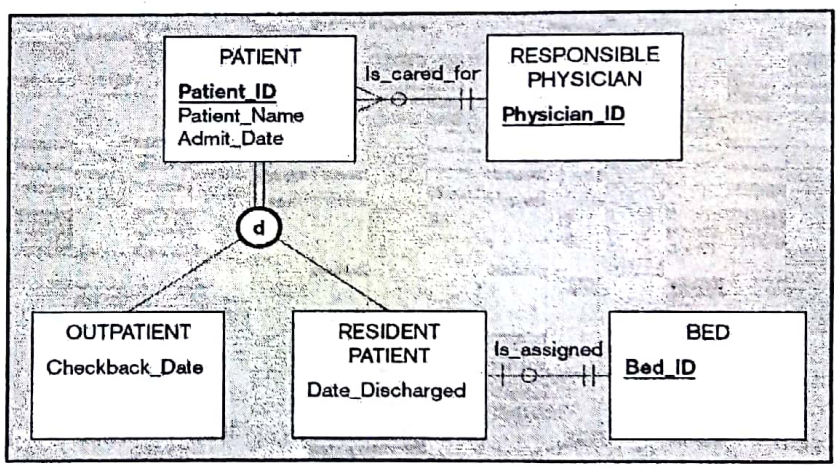
Question 1*(20 Marks)*

(a) Define the Relational Database. What is the difference between Relational Database schema and the Entity-Relationship schema.

(b)(i)Transfer each of the following twoEER schema to Relational Database schema, then,
(ii) Denormalizeeach of them in suitable relation.

Fig. 1

Fig. 2



Question 2*(20 Marks)*

(a) What is the "E-R Model" referred to? What are the main components of ER model? Explain by example.

(b) What is the difference between supertype and subtype relationships in EER Model of DBMS.

(c) A bank has three types of **ACCOUNTS**: checking, savings, and loan. Following are the attributes for each type of account:

CHECKING: **Acct No, Date Opened, Balance, Service Charge**
SAVINGS: **Acct No, Date Opened, Balance, Interest Rate**
LOAN: **Acct No, Date Opened, Balance, Interest Rate, Payment**

Assume that each bank account must be a member of exactly one of these subtypes.

i. Draw an Entity-Relationship schema for this situation. (Remember to include a subtype discriminator.)
ii. What attribute or attributes did you designate as the **identifier** for the **ACCOUNTS** entity? Why?
iii. Transfer the following E-R schema to Relational Database schema.

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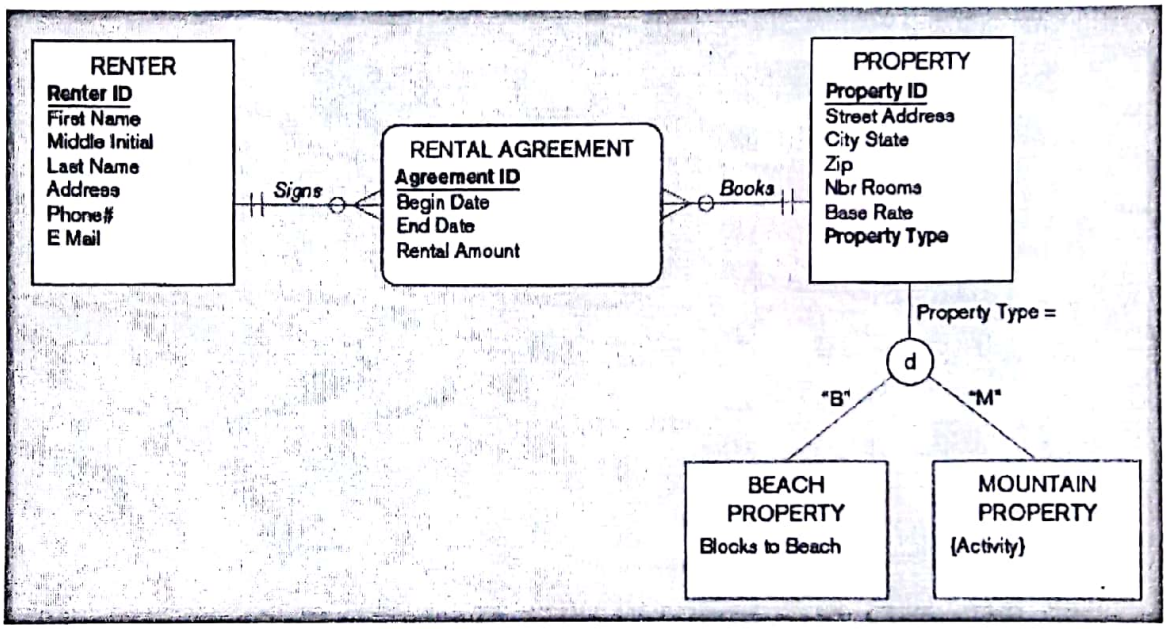
Question 3 *(30Marks)*

(a) SELECT statement is one of the important statements in SQL language. Write the parts of this statement in order.

(b) What is meant by Data Normalization? Construct the three main steps in ***Normalization***.

(c) The following figure shows an EER diagram for Vacation Property Rentals. This organization rents preferred properties in several states. As shown in the figure, there are two basic types of properties: beach properties and mountain properties.

i. Transform the EER diagram to a set of relations and developa relational schema.
ii. Diagram the functional dependencies and determinethe normal form for each relation.
iii. Convert all relations to third normal form, if necessary,and draw a revised relational schema.
iv. Suggest an integrity constraint that would ensure that noproperty is rented twice during the same time interval.



Question 4 *(20 Marks)*

(a) In the Physical Design Process, what is meant by Data Volume and Usage Analysis.

(b) What is meant by Denormalization? Mention the common denormalization opportunities.

(c) Consider the following normalized relations for a sports league:

TEAM(TeamID, TeamName, TeamLocation)
PLAYER(PlayerID, PlayerFirstName, PlayerLastName, PlayerDateOfBirth, PlayerSpecialtyCode)
SPECIALTY(SpecialtyCode, SpecialtyDescription)
CONTRACT(TeamID, PlayerID, StartTime, EndTime, Salary)
LOCATION(LocationID, CityName, CityState, CityCountry, CityPopulation)
MANAGER(ManagerID, ManagerName, ManagerTeam)

(i)What additional information would you need to make fully informed denormalization decisions?

(ii)Draw the relations after denormalization process.

With my best wishes **Dr. GhadaHamisa**

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