Kafrelsheikh University		2nd Year Students
Faculty of Engineering		(2007 modified)
Electrical Engineering Dept.		Final Exam
Subject: Database Management Systems		Date: 24 /1 / 2018
(Full Mark: 90 Marks)		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) SELECT statement is one of the important statements in SQL language. Write the parts of this statement in order.

(b) Denormalize each of them in suitable relation (if possible). Than draw the relational schema.
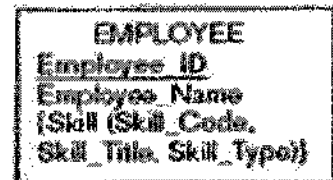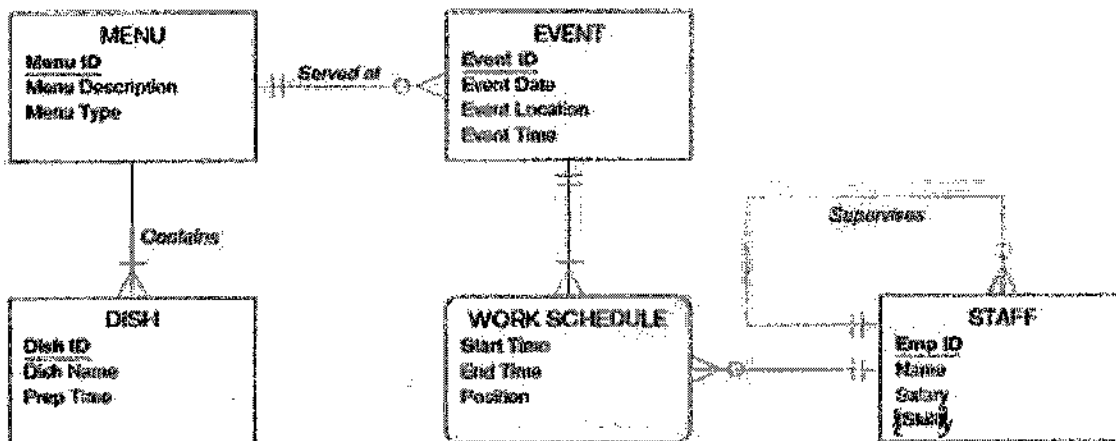

Fig. 1

Fig. 2

Fig. 3

Question 2 (25 Marks)

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

(b) Study the following Figure shows an EER diagram for a university dining service organization that provides dining services:

    i. Transform the EER diagram to a set of relations and develop a relational schema.

    ii. Diagram the functional dependencies and determine the normal form for each relation.

    iii. Convert all relations to 3N form, if necessary, and draw a revised relational schema.

    iv. Write the SQL code for creating the entity called "DISH".

Question 3 (20 Marks)

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

(b) Emerging Electric (محصل كهرباء) creates a database with the following entities and attributes:

- **Customer**, with attributes *Customer_ID, Name, Address (Street, City, Z_Code)*, and *Telephone*
- **Location**, with attributes *Location_ID, Address (Street, City, Z_Code)*, and *Type (values of Business or Residential)*
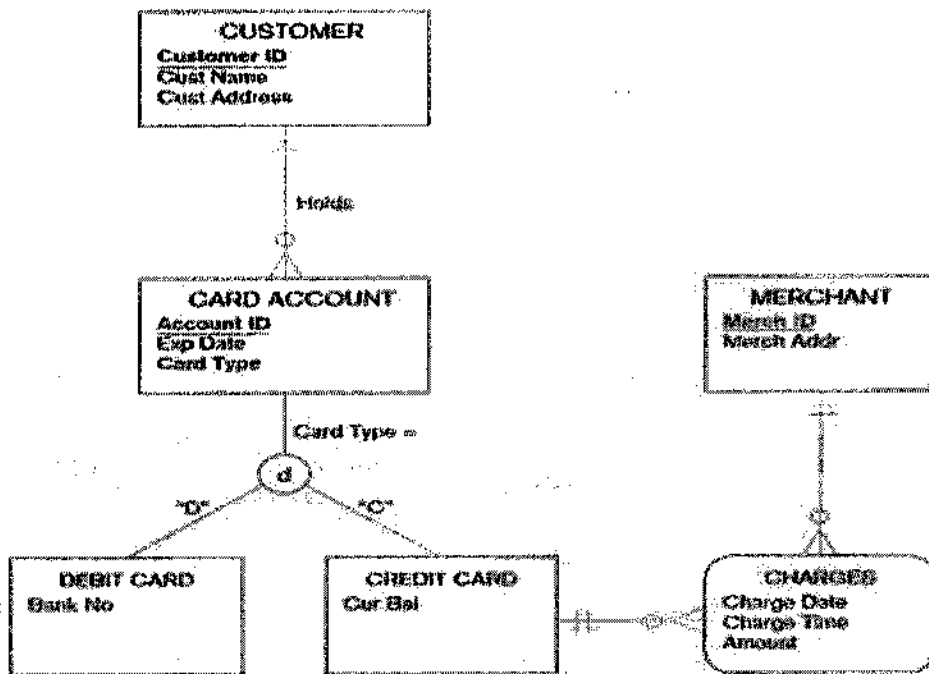- **Rate**, with attributes *Rate_Class* and *RatePerKWH*

After interviews with the owners, you have come up with the following business rules:

- Customers can have one or more locations.
- Each location can have one or more rates, depending on the time of day.

i. Draw an Entity-Relationship schema for this situation.(State any assumptions if you need)
ii. What attribute (or attributes) did you designate as the **identifier** for the entities in ER model?
iii. Transfer the following E-R schema to Relational Database schema.

Question 4 (25 Marks)

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

(b) Mention the three main factors of *Integrity Constraints*. What is meant by *Relational Integrity Constraints?*

(c) The following EER diagram for a simplified credit card environment.
i. Develop a relational schema.
ii. Show the *Relational Integrity Constraints* for that problem.
iii. Is there found a possible denormalization situation? if yes, do the following:
- What would you need to make fully informed denormalization decisions?
- Draw the relations after denormalization process.