



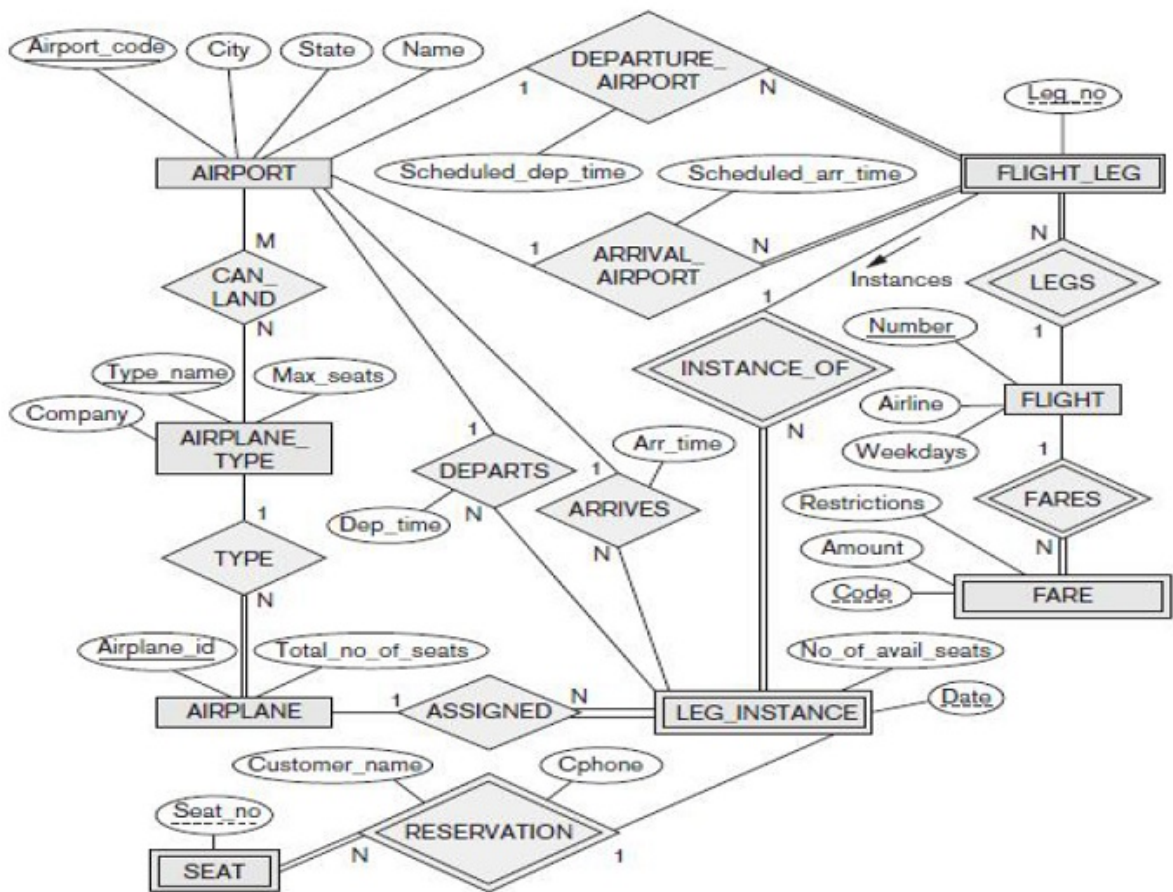
Marks: 50

Duration: 90 mins.

CAT-I, Winter Sem 2018-2019

Answer all the questions.

- 1) If you were designing a Web-based system to make airline reservations and sell airline tickets, which DBMS architecture would you choose? Why? Why would the other architectures not be a good choice? (10)
- 2) UPS prides itself on having up-to-date information on the processing and current location of each shipped item. To do this, UPS relies on a company-wide information system. Shipped items are the heart of the UPS product tracking information system. Shipped items can be characterized by item number (unique), weight, dimensions, insurance amount, destination, and final delivery date. Shipped items are received into the UPS system at a single retail center. Retail centers are characterized by their type, uniqueID, and address. Shipped items make their way to their destination via one or more standard UPS transportation events (i.e., flights, truck deliveries). These transportation events are characterized by a unique scheduleNumber, a type (e.g, flight, truck), and a deliveryRoute.Â  
Create an Entity Relationship diagram that captures this information about the UPS system. Be certain to indicate relationships, Key attributes and cardinality constraints. (10)
- 3) Consider the following relations for a database that keeps track of automobile sales in a car dealership (OPTION refers to some optional equipment installed on an automobile): (10)  
CAR(Serial no, Model, Manufacturer, Price)  
OPTION(Serial no, Option name, Price)  
SALE(Salesperson id, Serial no, Date, Sale\_price)  
SALESPERSON(Salesperson id, Name, Phone)  
First, specify the foreign keys for this schema, stating any assumptions you make. Next, populate the relations with a few sample tuples, and then give an example of an insertion in the SALE and SALESPERSON relations that violates the referential integrity constraints and of another insertion that does not.
- 4) Consider the Airline database ER diagram. Map the ER Diagram to Relational data base schema. Be certain to indicate primary keys and Foreign key. (10)



5) Consider a database with the following schema: (10)

<i>Person</i> ( name, age, gender )	name is a key
<i>Frequents</i> ( name, pizzeria )	(name, pizzeria) is a key
<i>Eats</i> ( name, pizza )	(name, pizza) is a key
<i>Serves</i> ( pizzeria, pizza, price )	(pizzeria, pizza) is a key

Write relational algebra expressions for the following queries.

- Find all pizzerias frequented by at least one person under the age of 18.
- Find the names of all females who eat either mushroom or pepperoni pizza (or both).
- Find the names of all females who eat both mushroom and pepperoni pizza.
- Find all pizzerias that serve at least one pizza that Amy eats for less than \$10.00.

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