



2016

Library

University of Engineering and Technology, Lahore

Introduction to Database

Registration Number _____

Final Term (Spring 2019)

Combined Paper for Affiliated Colleges

Total Marks: 40

Total Time: 90 mins

Question No. 1

[3+2+3: 8 marks]

Model the following relationships in ER. (These are three different statements and have no link with each other. Consider each of the following statement as separate mini world, and draw ER diagram for each of them)

- An apartment is located in a house in a street in a city in a country.
- Two teams play football against each other. A referee makes sure the rules are followed.
- Olympic games happen in a certain year at a certain place. Each year, there is at most one instance of Olympic games. In each discipline of an Olympic game, there is exactly one gold medallist and one silver medallist. All these medallists are athletes. Give an ER model for this mini world. Identify the keys and give the functionalities of all relationships.

[3+3+8: 14 marks]

Question No. 2

1) What is the difference between Functional Dependencies and Multivalued Dependencies.

2) Given a relation R (A,B,C,D,E,F,G) with the following five functional dependencies

$$F: (1) A \rightarrow BC \quad (2) E \rightarrow CF \quad (3) B \rightarrow E \quad (4) CD \rightarrow EF \quad (5) A \rightarrow G$$

- Find the closure of A.
 - Find a candidate key for R.
 - What is the closure of G
- 3) Consider the following relation: Student(SSN, sName, address, HScode, HSname, HScity, GPA, priority) and the following functional dependencies:

$$SSN \rightarrow sName, address, GPA$$

$$GPA \rightarrow priority$$

$$HScode \rightarrow HSname, HScity$$

What is the BCNF decomposition algorithm. Apply the BCNF decomposition algorithm for the given data. At each step, show the relations which were eliminated from final result due to violation of BCNF.

Question No. 3

[2+2.5+2.5+2.5+2.5: 12 marks]

1) Consider the following relational schema and answer the queries using SQL.

Taxi (tID, tNumber, modelYear, owner)

English: There is a taxi with ID number tID, taxi registration number tNumber, modelYear of taxi and name of taxi owner.

Customer (cID, name)

English: The customer with ID number cID has a certain name.

Rider (rID, cID, tID, rideStart, rideEnd)

- Show the ride ids which were taken in month of February of any year.
- List the years of taxi model which have more than 10 taxis.
- Prepare the report of rides taken in year 2008 in the following format.

Rides(CustomerName, TaxiNumber, RideDate)

- Taxi company wants to analyze the inactive customers. Display the name of customers who have not taken ride after 31st March 2015.
- List the taxi numbers who have received average rating of more than 4.5 stars.

English: The customer cID took the ride in the taxi tID at time and date rideStart and ended ride at rideEnd(datetime). Each ride is assigned a unique id rIDs

Rating(rID, stars, ratingDate)

English: The ride rID is rated with stars on ratingDate

Question No. 4

[2+4: 6 marks]

- Describe the ACID properties of transaction?
- What are the characteristics of database approach.