

UKA TARSADIA UNIVERSITY

Integrated M.Sc. (IT) (1st Semester)

Subject :060010110-CC2 Database Management Systems (Theory)

Date :07/05/2016

Time :10:30AM to 1:30PM

Duration : 3Hours

Max. Marks : 60.

Instructions:

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks allocated to that question.
5. Draw diagrams/figures whenever necessary.

SECTION - 1

Q-1 (A) Answer the following.

[04]

- I) Define: seek time
- II) Give an example of single valued and multi valued attribute.
- III) What is a schema?
- IV) How records are stored in sequential file?

Q-1 (B) Answer the following in brief. (Any 3)

[06]

- I) State any four disadvantages of conventional file system.
- II) Give an example demonstrating the concept of primary key and candidate key.
- III) On which four measures classification of physical storage media can be done?
- IV) Write four components of storage manager.

Q-2 Answer the following.

[10]

- A) Design an E-R diagram for Library Management System. The database must keep track of students and their books issued, on individual membership card. Maximum five books can be allotted to one student. Also information about the date of issued books and date of returned books. Also information about the total number of books available in the library for each title should be available. Draw an Enhanced ER diagram that shows the entity types, attributes, relationships, and participation constraints for this application. State any assumptions you make.

OR

- A) Suppose you are given the following requirements for a simple database for the National Volleyball Campain (NVC):

- the NVC has many teams,
- each team has a name, a city, a coach, a captain, and a set of players,
- each player belongs to only one team,
- each player has a name, a position (such as smasher or defencer), a skill level, and a set of injury records,
- a team captain is also a player,
- a game is played between two teams (referred to as host team and guest team) and has a date (such as May 11th, 1999) and a score (such as 4 to 2).

Construct a clean and concise ER diagram. List your assumptions and clearly indicate the cardinality mappings.

- B) Design Generalization-Specialization hierarchy for the University. University offers different courses and there are many students registered in that, faculties are there to deliver lectures in different courses. Make your own further assumptions.

OR

- B) Design Generalization-Specialization hierarchy for Online shopping system. Online shopping provides different types of products namely clothes for all gender and ages, home and kitchen appliances, furniture's and many more. Only registered users can purchase products and normal users can only view the products.. Make your own further assumptions.

Q-3 Answer the following in detail. (Any 2)

[10]

- A) Discuss mapping cardinality constraints with the help of an appropriate example showing their entity relationship.

- B) Explain in detail 3-tier architecture of database with the help of a diagram.
- C) How ternary relationship can be converted into binary relationship? Explain it with the help of an example and the steps included in it.

SECTION - 2

Q-4 (A) Answer the following.

[04]

- I) What problems occur if the database is not in normalized form?
- II) Define: super key
- III) Give a key difference between having and group by clause.
- IV) Write a DML statement to display minimum price from Product (Pid, Pname, Quantity, Unit_Price).

Q-4 (B) Answer the following in brief. (Any 3)

[06]

- I) What are database anomalies? List two anomalies.
- II) Give two examples of string operations in MySQL while performing queries.
- III) Write a DDL statement to create Customer (Cust_ID, cust_name, Date_of_birth, phoneno, Email_ID, Address) with proper constraints like Cust_ID should be primary key. Also write one insert statement for the above DDL query.
- IV) Enlist any six E.F.Codd's Rules.

Q-5 Answer the following.

[10]

- A) Normalize the given relation Doctor upto third normal form.
 Doctor(Doc_Id, Doc_Name, Degree, Specialization, Pateint_id, appointment_date)
 Set of functional dependencies:
 $\text{Doc_Id} \rightarrow \text{Doc_Name}$, $\text{Degree} \rightarrow \text{Specialization}$
 $\text{Doc_Id}, \text{appointment_date} \rightarrow \text{Patient_id}$
 $\text{Degree} \rightarrow \text{Specialization}$

OR

- A) Consider the relation Employee_Project(Emp_ID,Pno,Esal,Ephone,Dno,Pname,Plocation,PCompletionDt)
 Given is the set of Functional Dependencies
 $\text{Emp_ID} \rightarrow \text{Esal}$, $\text{EphoneNo} \rightarrow \text{Dno}$
 $\text{Pno} \rightarrow \text{Pname}$, $\text{Plocation} \rightarrow \text{PCompletionDate}$
 An employee can work on multiple projects
 1. Identify Candidate Key, Super key.
 2. Identify whether the relation is in 3NF or not. If no then decompose it to 3NF.

- B) Consider the following tables:

Passenger(Passengerid,Pname,City,State,Pincode,Date_of_travelling,Bus_id)
 Bus(Bus_id,route_no,route_name,tarrif)

1. How many passengers has travelled for Chennai between 1st May 2015 to 1st June 2015.
2. List the passengers who have paid maximum tarrif among city Baroda, Surat and Bardoli.
3. List all the passengers names and their route name who have travelled for Himmatnagar.

OR

- B) Consider the following tables:
 Company (cid, cname, city)
 Student(sid, sname, course, scity, pid)
 Project (pid, projecttitle, technology, cid)

1. List the students who are working on "restoapp" and company name as "web king".
2. How many students have done their project in java?
3. List all the students who are living in Surat but not doing project in Surat.

Q-6 Answer the following in detail. (Any 2)

[10]

- A) State the goal of normalization. Explain third normal form with a suitable example. Also state two differences between first normal form and second normal form.
- B) Discuss Functional dependency with Armstrong's inference rules. Also give one example in which any two of the rules can be applied and list the members of its closure.
- C) Explain in detail Lossy and Lossless Decomposition with the help of an appropriate example.