# UKA TARSADIA UNIVERSITY

**Integrated M.Sc. (IT) (1stSemester)**

**Subject :**060010110-CC2 Database Management Systems (Theory)(2015-16)

**Date : 04/01/2016** **Time: 10.00 AM to 1.00 PM**
**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) List at least two devices where flash memory is used.

II) Who translate DML statement in query language in to low level instruction that the query evaluation can understand?

III) Which language is associated with a DBMS that is employed by end users and programmers to manipulate data in a database?

IV) What is domain constraint?

**Q-1 (B) Answer the following in brief. (Any 3)** **[06]**

I) How seek time and latency time differs from each other?

II) Define data inconsistency using example.

III) How does conventional file processing system works?

IV) Why DML statement should be compiled and DDL statement should be interpreted?

**Q-2 Answer the following.** **[10]**

A) Assume we have the following application that models soccer teams, the games they play, and the players in each team. In the design, we want to capture the following:

- We have a set of teams, each team has an ID (unique identifier), name, main stadium, and to which city this team belongs.
- Each team has many players, and each player belongs to one team. Each player has a number (unique identifier), name, DoB, start year, and shirt number that he uses.
- Teams play matches, in each match there is a host team and a guest team. The match takes place in the stadium of the host team.
- For each match we need to keep track of the following:
  - The date on which the game is played
  - The final result of the match
  - The players participated in the match. For each player, how many goals he scored, whether or not he took yellow card, and whether or not he took red card.
  - During the match, one player may substitute another player. We want to capture this substitution and the time at which it took place.
- Each match has exactly three referees. For each referee we have an ID (unique identifier), name, DoB, years of experience. One referee is the main referee and the other two are assistant referee.

Design an ER diagram to capture the above requirements. State any assumptions you have that affects your design ). Make sure cardinalities and primary keys are clear.

**OR**

A) Draw an E_R Model for the following:

An organization uses number of items of a equipment to produce goods. Each item is at one LOCATION, of one TYPE and has a DETAILED_DISCRIPTION. Faults on the equipment are identified by a unique FAULT_ID and are reported at a TIME_REPORTED. Any number of persons may be assigned to a fault and work on the fault until it is fixed. The TIME_FIXED is recorded as is the TIME_SPENT by each person on a fault. Any number of parts may be used to repair a fault. The QTY_USED of each part is

recorded against the fault. Each part is identified by a PART_ID and has a given weight and MAX_DIMENSION and can have any number of colors.

B) Suppose customer information such as cricketer_id, cricketer_name, city, phone_no is to be stored in a file and also it is frequently accessed and searched on cricketer_name. Assuming such scenario, why it is suitable to store records in sequential file organization rather than heap file organization technique? Justify your reasons.

**OR**

B) Discuss the correspondence between the E-R model construct and the relation model construct. Show how each E-R model construct can be mapped to the relational model using the suitable example.

**Q-3 Answer the following in detail. (Any 2)** **[10]**

A) Explain multi table clustering file organization.

B) Write a short note on object based and semi structured databases.

C) Explain all four types of mapping cardinality with appropriate examples.

## SECTION - 2

**Q-4 (A) Answer the following.** **[04]**

I) What is dependency preservation?

II) Define prime and non-prime attribute.

III) What is the purpose of using wild card in where clause?

IV) Which qualifier must be included to remove duplicate rows from the result of the select statement?

**Q-4 (B) Answer the following in brief. (Any 3)** **[06]**

I) What is denormalization and why would someone consider doing so?

II) Write two key difference between CHAR and VARCHAR data type.

III) How one can modify the data type of column in table?

IV) What is the difference between a correlated subquery and a regular subquery?

**Q-5 Answer the following.** **[10]**

A) Discuss the purpose of Boyce-Codd normal form and describe how BCNF differs from and is stronger than 3NF. Illustrate your answer with an example.

**OR**

A) Apply the normalization up to 3NF on below given table also state the rules for 1NF, 2NF and 3NF.
CLIENT (Client#, Name, Location, Manager#, Manager_name, Manager_location, Contract#, Estimated_cost, Completion_date, Staff#, Staff_name, Staff_location)

B) Consider following table and perform given queries:
Game(gid, mdate, stadium, team1, team2)
Goal(matchid, teamid, player, gtime)
Team(tid, teamname, coach)

1. List the the dates of the matches and the name of the team in which 'Fernando Santos' was the team1 coach.
2. List the player for every goal scored in a game where the stadium was 'National Stadium, Warsaw'.
3. Show player, teamid, coach, gtime for all goals scored in the first 10 minutes gtime<=10.

**OR**

B) Consider following table and perform given queries:
employee(employee-name, street, city)
works(employee-name, company-name, salary)
company(company-name, city)
manages(employee-name, manager-name)

1. Find the names of all employees in the database who earn more than every employee of 'Small Bank Corporation'.
2. Find the names of all employees who earn more than the average salary of all employees of their company.
3. Find the names of all employees in the database who live in the same cities as the companies for which they work.

**Q-6 Answer the following in detail. (Any 2)** **[10]**

A) Write a note on inference rules of functional dependency. Explain with suitable examples.

B) What do you mean by GROUPING? Explain with example

C) List any five string functions and explain with proper use, syntax, description and example.