I M.Tech - I Semester- Supplementary Examinations
FEBRUARY-2020

DATA BASE MANAGEMENT SYSTEMS
(COMPUTER SCIENCE & ENGINEERING)

Duration: 3 hours   Max Marks: 70

Answer any FIVE questions.   All questions carry equal marks

1. a) Describe characteristics of the Database approach.   5 M

   b) Illustrate Three-Schema Architecture   for database
      systems.   4 M

   c) Discuss advantages of using the DBMS approach.   5 M

2. a) A database is being constructed to keep track of the teams
      and games of a sports league. A team has a number of
      players, not all of whom participate in each game. It is
      desired to keep track of the players participating in each
      game for each team, the positions they played in that game,
      and the result of the game. Design an ER schema diagram
      for this application, stating any assumptions you make.
      Choose your favorite sport (e.g., baseball, football).   10 M

   b) Summarise relationship types of degree higher than Two.
                                                              4 M

3. a) Consider an AIRLINE relational database schema, apply the following queries to specify in relational algebra:

   i) List the flight number, departure airport code, scheduled departure time, arrival airport code, scheduled arrival time, and weekdays of all flights or flight legs that depart from some airport in the city of Houston and arrive at some airport in the city of Los Angeles.

   ii) Retrieve the number of available seats for flight number 'co197' on '2020-10-29'.   10 M

   b) Demonstrate Relational Database Design by ER-to-Relational Mapping.   4 M

4. a) Examine Join Dependencies and Fifth Normal Form.
                    7 M

   b) Evaluate Algorithms for Relational Database Schema Design.   7 M

5. a) Summarize hashing techniques in File Organization & Indexing.   7 M

   b) Demonstrate dynamic multilevel Indexes using B-Trees & Indexes on multiple Keys.   7 M

6. a) Summarize search methods that can be used to implement a select operation and Cost Functions and Components for Query Execution and Query Optimization .   7 M

b) Discuss transformation rules and heuristic Algebraic Optimization Algorithm for Query Optimization.

7 M

7. a) Discuss the Characterization of Schedules Based on Recoverability & Serializability in transaction processing.

7 M

b) Discuss Transaction Support in SQL to ensure desirable properties of transactions. 7 M

8. a) Investigate different concurrency control techniques and problems associated with the use of locks and show how these problems are handled. 7 M

b) Discuss database recovery techniques based on deferred update and immediate. 7 M