Code No: **RT31054** **R13** SET - 1

III B. Tech I Semester Supplementary Examinations, August - 2021

DATABASE MANAGEMENT SYSTEMS

(Common to Computer Science and Engineering, Information Technology)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

*****

PART –A **(22 Marks)**

1. a) What is data independence and how does a DBMS support it? [3M]
   b) Can a foreign key value in a database be NULL or Duplicates? Justify your answer. [4M]
   c) List out various SET comparison operators in SQL and also write about its use in writing SQL queries. [4M]
   d) When is schema decomposition said to be dependency-preserving? [4M]
   e) Discuss the merits and demerits of Deferred database modification technique. [4M]
   f) How is data organized in a tree-based index? [3M]

PART –B **(48 Marks)**

2. a) Explain any four significant advantages of using Database Management Systems over storing conventional file system for maintaining data in an organization. [8M]
   b) With a neat diagram, explain the structure of Database Management System. [8M]

3. a) Explain in detail, the form of a basic SQL query with a suitable example. [7M]
   b) Consider the following Relational schemas, [9M]
      Sailors(sid: *Integer*, sname: *String*, age: *Integer*, rating: *Integer*)
      Boats(bid: *Integer*, bname: *String*, bcolor: *String*)
      Reserves(sid: *Integer*, bid: *Integer*, date: *Date*)
      i) Write a query to find the names of sailors who have reserved red color boat.
      ii) Write a query to find the names of sailors who have not reserved a red color boat.
      iii) Write a query to find all sids of sailors who having rating of 10 and reserved boat number 104.

4. a) Explain about constraints and cardinality ratios in ER diagram by taking a suitable example. [8M]
   b) What is a View? How do views support logical data independence? How are views used for security? How are queries on views evaluated? Why does SQL restrict the class of views that can be updated? [8M]

5. a) Given a Relation R=(A,B,C) and Functional Dependencies are [8M]
F={ {A,B}→{C}, {C}→{A} }
Determine all Candidate keys of R and the normal form of R with proper explanation.
b) Define Multi-valued dependency. Explain the Fourth normal form with an example. [8M]

6. a) Explain why timestamp-based concurrency control allows schedules that are not recoverable. Describe how it can be modified through buffering to disallow such schedules. [7M]
b) What are the advantages of the ARIES recovery algorithm? Describe the three steps in crash recovery in ARIES with an example execution history and also give the three main principles of the ARIES recovery algorithm. [9M]

7. a) How indexing techniques help in improving the performance of external sorting? Explain. [8M]
b) Explain about dynamic multilevel indexing using B+ trees. [8M]

*****