

**II B. TECH I SEMESTER REGULAR EXAMINATIONS, MARCH - 2022**  
**DATABASE MANAGEMENT SYSTEMS**  
**(Artificial Intelligence and Data Science)**

**Time: 3 Hours****Max. Marks: 70**

**Note : Answer ONE question from each unit (5 × 14 = 70 Marks)**

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UNIT-I

1. a) Interpret data, database and DBMS and outline the applications of DBMS. [7M]  
b) Compare and contrast various Data Models. [7M]  
(OR)
2. a) Discuss various functionalities of DBA. [7M]  
b) Explain various levels of abstraction in the DBMS. Write the advantages of DBMS. [7M]

UNIT-II

3. a) Explain about the additional features of E-R model. [7M]  
b) Explain briefly about the relational algebra operations. [7M]  
(OR)
4. a) Classify set operations in relational algebra and explain. [7M]  
b) Discuss the features of domain relational calculus. [7M]

UNIT-III

5. a) Write the SQL queries using the following relational database. [7M]  
Students (snum : integer, sname : string, age : integer, cid : integer)  
Enrolled (cid : integer, cname : string, facid : integer)  
Faculty (facid : integer, fname : string, dept : string)
  - a) Find the names of students who are enrolled in a class taught by Harish.
  - b) Find the age of oldest student.
  - c) Find the names of students enrolled in History.
  - d) Find the department of faculty whose name starts with 's'.
  - e) Find the names of students who are enrolled in a class and age is over 17 taught by Harish.
- b) Discuss the working of various joins in SQL with examples. [7M]

(OR)

6. a) Consider the following relational schema [7M]  
Sailors (sid : string, sname : string, rating : integer, age : real)  
Boats (bid : integer, bname : string, color : string)  
Reserves (sid : integer, bid : integer, day : date)  
Based on the above schema, write the SQL queries for the following?
- i) Find the colors of boats reserved by Anil.
  - ii) Find the names of sailors whose age is more than 20.
  - iii) Find the names of sailors who have reserved a red or green boat.
  - iv) Find the names of the sailors who have reserved both a Red boat and a Green boat.
  - v) Find names of sailors who have reserved all boats.
- b) Explain various constraints available in SQL. [7M]

## UNIT-IV

7. a) How does BCNF differ from 3NF? Explain with an example. [7M]  
b) Explain about the problems caused by Redundancy. [7M]

(OR)

8. a) Discuss the problems related to decompositions. [7M]  
b) Discuss about 5NF with example. [7M]

## UNIT-V

9. a) Demonstrate log-based recovery technique. [7M]  
b) Determine when two operations in a schedule are said to be conflict? [7M]

(OR)

10. a) Explain about strict two phase locking protocol. [7M]  
b) Discuss about the deadlock prevention and detection. [7M]

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