

BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
B. Tech. Sem - IV Computer Science and Business Systems : WINTER : 2023
SUBJECT : DATABASE MANAGEMENT SYSTEMS

Day : Tuesday

Date : 21-11-2023

W-24155-2023

Time : 02:30 PM-05:30 PM

Max. Marks : 60

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.

Q.1 Explain all the conventions used in an E-R diagram. Draw an E-R diagram for Train Reservation System showing generalization, weak entities and different types of attributes. Convert the E-R diagram into Relational Model. (10)

OR

What is a Database Management System? Explain its advantages over File Management System.

Q.2 Write SQL queries for the following set of tables: (10)

Employee (emp_no, name, dob, address, gender, salary, dnumber)

Department (dno, dname, manager_emp_no, manager_startdate)

- i) Display the age of 'male' employees.
- ii) Display all employees in department named 'Marketing'.
- iii) Display the name of highest salary paid 'female' employee.
- iv) Which employee is oldest manager in company.
- v) Display the name of department of the employee 'Smith'.

OR

a) Write a short note on Tuple Relational Calculus and Domain Relational Calculus.

b) Write short note on different types of Joins in SQL.

Q.3 Explain the different Normal forms. Given a relation R with 5 attributes A, B, C, D and E & the following FD: $A \rightarrow B$, $BC \rightarrow E$ and $ED \rightarrow A$. Is R in 3NF? Justify. (10)

OR

What are update anomalies? Explain the need and significance of normalization.

Q.4 Write a detail note on B+ Tree Indexing in DBMS. Also explain how it is different than B Tree Indexing. (10)

OR

a) Explain different steps in query processing with a neat block diagram.

b) Explain significance of sorting in DBMS. Explain in detail N-way merge sort with example.

Q.5 Discuss about Conflict Serializability and View Serializability. Does two phase locking protocol ensure Conflict Serializability. Justify your answer with example. (10)

OR

Write a note on

i) Database recovery ii) Shadow paging

Q.6 Write a note on (10)

i) Web database ii) Distributed database

OR

Write a short note on:

i) SQL Injection ii) IDS