PVP 19

Code: 19CS3503, 19IT3503

III B.Tech - I Semester – Regular Examinations – JANUARY 2022

DATABASE MANAGEMENT SYSTEMS

(Common to CSE & IT)

Duration: 3 hours Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 5 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each question carries 12 marks.
4. All parts of Question paper must be answered in one place

PART – A

1. a) What is schema? Give syntax and example for creating it in SQL.
   b) What are binary relation operators in Relational Algebra? Give example for it.
   c) Briefly explain the significance of 'ternary relationship' with example.
   d) Define 5NF and give example.
   e) What is Two-Phase Locking? Give example.

PART – B

UNIT – I

2. a) Describe Three-schema Architecture 6 M
   b) Explain in detail about Database Management System advantages over file management system. 6 M

OR

3. a) List the characteristics of database approach and explain with suitable examples. 6 M
   b) Discuss about data models, instances and schemas with suitable examples. 6 M

UNIT – II

4. i) Write SQL syntax for creating table 12 M

EMP (EMPNO, FIRSTNAME, LASTNAME, SALARY, JDATE, DEPENDENT, SUPERVISOR).

ii) Write SQL syntax for insert two rows in table, delete one row from table, update salary and view whole table.

iii) Retrieve the name of each employee who has a dependent with the same first name as the employee.

iv) Retrieve the names of all employees who do not have supervisors.

OR

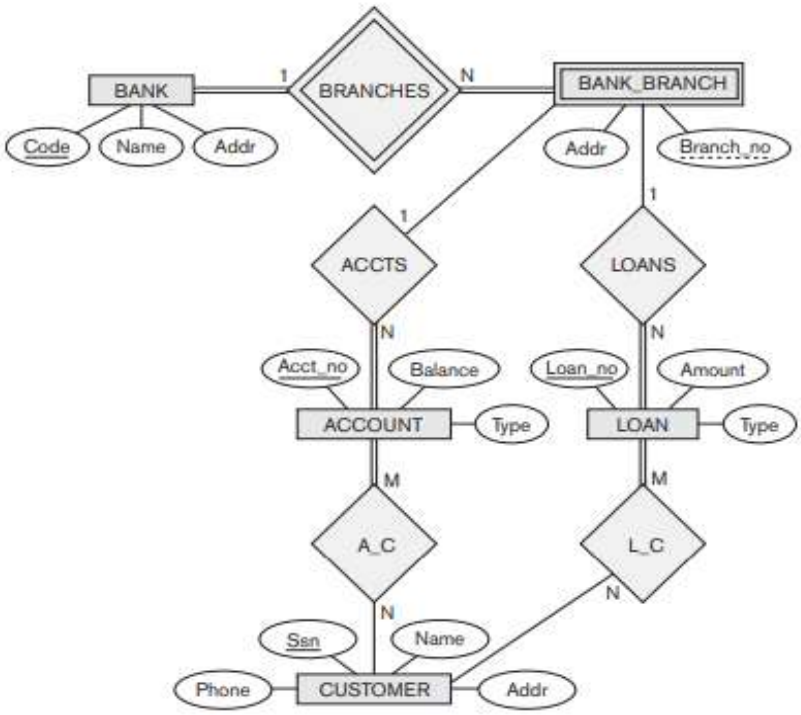
Explain the following with suitable examples 12 M

5. i) Triggers ii) Nested queries iii) Views

UNIT-III

12 M

6.



Consider the above ER diagram write all the possible relations with all possible constraints and cardinalities. Justify.

OR

7. Draw an EER diagram to model a university database as described below. Represent the situation as accurately as possible, including participation, cardinality, and key constraints as appropriate. Also identify any attributes which are required (i.e., should be NOT NULL). Note any constraints present that you did not capture in the diagram along with a reason why they were omitted. If necessary specifics are lacking in the description of the situation, make reasonable assumptions and state those assumptions. 12 M

i) Student information includes each student's name (required), ID number (required), social security number, current address and phone, permanent address and phone (required), birth date, sex, and class (first year, sophomore, junior, senior). Some applications need to refer to the city, state, and zip code of the student's permanent address and to the student's last name. Both the social security number and student ID number are unique for each student. Class is determined by the number of credits earned.

ii) A student's major(s) and minor(s) are also recorded. A major and a minor or second major are required to graduate.

iii) Course information includes the course name, course description, subject prefix (e.g. CPSC), course number, and number of credits. The subject prefix and course number uniquely identify each course. Every course must be offered by a department, and one course cannot be offered by more than one department.

UNIT – IV

8. a) Consider the universal relation R = {A, B, C, D, E, F, G, H, I, J} and the set of functional dependencies — 6 M

$$F = \{ \{A, B\} \rightarrow \{C\}, \{A\} \rightarrow \{D, E\}, \{B\} \rightarrow \{F\}, \{F\} \rightarrow \{G, H\}, \{D\} \rightarrow \{I, J\} \}.$$

What is the key for R? Decompose R into 2NF and then 3NF relations.

b) What is join dependencies? Explain with suitable example. — 6 M

OR

9. Consider the following relation: — 12 M

TRIP (Trip_id, Start_date, Cities_visited, Cards_used)

This relation refers to business trips made by company salespeople. Suppose the TRIP has a single Start_date, but involves many Cities and salespeople may use multiple credit cards on the trip. Make up a mock-up population of the table.

a) Discuss what FDs and/or MVDs exist in this relation.

b) Show how you will go about normalizing it.

UNIT – V

10. Explain how serializability is used for concurrency control with suitable example. — 12 M

OR

11. Explain the following with suitable examples — 12 M

a) Transaction rollback and cascading rollback

b) Transaction support in SQL