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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

May 2023 Semester End Main Examinations

Programme: B.E. **Semester: III**
Branch: Artificial Intelligence and Machine Learning **Duration: 3 hrs.**
Course Code: 22AM3PCDBM **Max Marks: 100**
Course: Database Management Systems **Date: 15.05.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1 a) Database approach is more effective than traditional file processing systems. Justify the statement and discuss the characteristics of database approach. **08**

b) Create the following database in SQL **08**

Sailors(sid: integer, sname: string, rating: integer, age: real)

Boats(bid: integer, bname: string, color: string)

Reserves(sid: integer, bid: integer, day: date)

Write the following queries in SQL

i. Find all information of sailors who have reserved specified boat number
ii. Find the ids and names of sailors who have reserved two different boats on the same date.
iii. Find the name and the age of the youngest sailor
iv. Find the names of sailors who have reserved all boats.

c) Write the syntax for the following SQL statements **04**

Create, update , alter, drop

OR

2 a) Eloborate the following concepts with suitable examples. **08**

i. Views in SQL ii. Aggregate functions

b) Consider an employee database with the following information **06**

Empid	Ename	Design	Sal	age
1	Anitha s	Programmar	50000	35
2	Babu	Sales	12000	23
3	Ram Prasad	Manager	65000	49
4	Raju	Attender	10000	35

Create the assertion for the following

i. Where salary not greater than 65000 and not less than 10000.
ii. Where age between 23 and 50

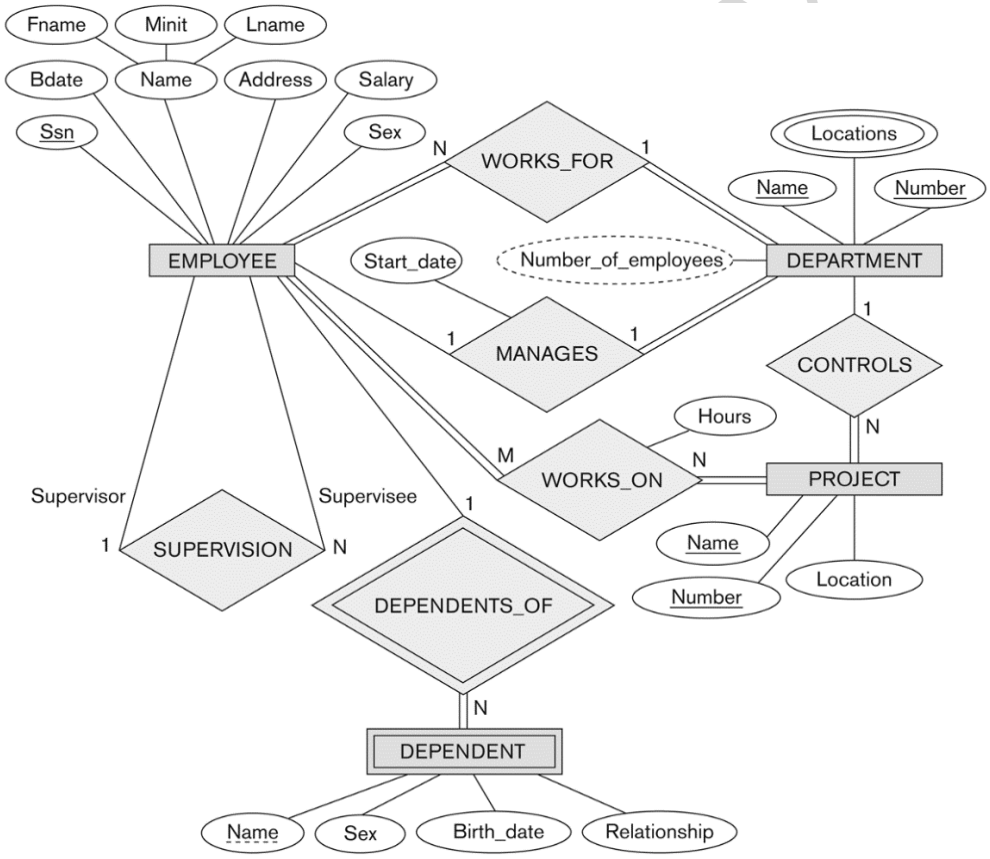
c) With a neat diagram Summarize three schema architecture. **06**

UNIT – II

3 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 diagram and schema for this application, stating any assumptions you make. Choose your favorite sport (e.g Cricket, Baseball, Football). Make sure the database comprise primary keys, cardinality ratio, derived attributes and week entities. **10**

b) Discuss the relational database design using ER to relational mapping. **10**

Convert the following ER diagram to relational schema diagram.



UNIT - III

4 a) Teachers of various departments publish their research papers in different journals. The following relation schemas are based on this scenario. **10**

Teacher (TID, name, designation, salary, address, doj, qualification, DNo)
Department (DNo, Dname, strength, Dtype)
Journal (Jname, ISSN, frequency, year_of_inception)
Publication (TID, ISSN, No_of_paper, VolumeNo, Month, Year)

Write the following queries using Relational Algebra.

i. Find the name of the teacher who has published in the journal whose name as "IJMDM"

ii. Find the Total number of papers published by the teacher whose name is Prof. Ramesh in 2019.
iii. Find the department name of the teachers who publish in journals whose year of inception is 2002.
iv. Find the name of the teacher who have highest number of publications

b) Discuss the relational algebra operations from set theory with suitable example **10**

UNIT - IV

5 a) State the informal guidelines for relational schema design. Illustrate how violation of these guidelines may be harmful for the database. **10**

b) Consider a relation **10**

Booktitle	Auth_name	Booktype	Listprice	Affiliation	Publication

With following Functional dependencies

Booktitle→Booktype, Publication

Auth_name→Affiliation

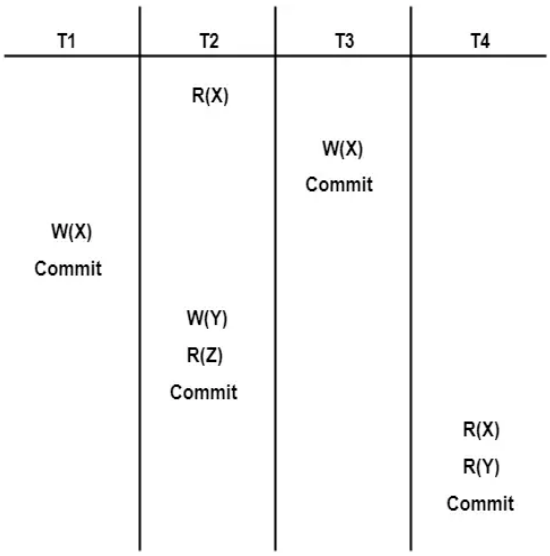
Booktype→Listprice

Apply normalization FORMS until you cannot decompose the relation further.

UNIT - V

6 a) Discuss the UNDO and REDO operations and the recovery technique that use each. **10**

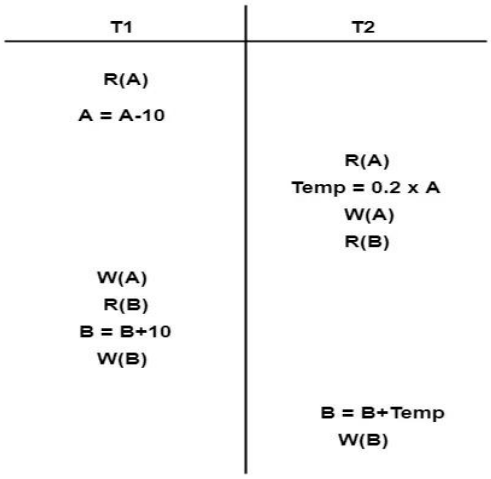
b) Check whether the given schedule S is conflict serializable and recoverable or not- **10**



OR

7 a) Write the ARIES Recovery Algorithm **06**

b) Determine all the possible serialized schedules for the given schedule- **06**



c) Discuss how serializability used to enforce concurrency control in database system with an example. "Serializability sometimes considered too restrictive measure of correctness for schedules". Justify. **08**

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