

R18

Code No: 154AM

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year II Semester Examinations, September/October - 2023

DATABASE MANAGEMENT SYSTEMS

(Common to CSE, IT, ECM, CSBS, CSIT, ITE, CSE (DS), AI&DS, AI&ML, CSD)

Time: 3 Hours

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

- 1.a) What is data independence and how does a DBMS support it? [2]
- b) What are the guidelines for using ER model effectively? [3]
- c) Define cardinality of a relation. [2]
- d) Give an example of unsafe query in TRC. [3]
- e) What are triggers? [2]
- f) How are primary keys related to FDs? [3]
- g) What is a serializable schedule? [2]
- h) Explain the impact of locking on performance briefly. [3]
- i) What are the advantages of indexed sequential access methods? [2]
- j) What is the relationship between extendible hashing and linear hashing? [3]

PART – B

(50 Marks)

- 2.a) Describe the three levels of abstraction in a DBMS.
- b) Differentiate between File systems and Database Management Systems. [6+4]

OR

- 3.a) A University database contains information about professors (identified by Social Security Number, or SSN) and courses (identified by course_id). Professors teach courses; each of the following situations concerns the Teaches relationship set. For each situation draw an ER diagram that describes it.
 - i) Professors can teach the same course in several semester and each offering must be recorded.
 - ii) Projects have a project number, a sponsor name, starting date and ending date.
 - iii) Every professor teaches exactly one course.
 - iv) Professors can teach the same course in several semesters, and only the most recent such offering needs to be recorded.
 - v) Every professor teaches exactly one course and every course must be taught by some professor.
- b) Explain the difference between DML and DDL. [7+3]

4.a) What is the need of Join operation in relational algebra? Explain several variants of Join operator.

b) With an example expression explain division operation. [5+5]

OR
5.a) Describe the importance of integrity constraints.

b) How do views support logical independence? Explain. [5+5]

6. Consider the following relational schema:

Emp(*eid*: integer, *ename*: string, *age*: integer, *sala111*: real)

Works (*eid*: integer, *did*: integer, *peLtime*: integer)

Dept(*did*: integer, *dname*: string, *budget*: real, *managerid*: integer)

a) Give an example of a foreign key constraint that involves the Dept relation. What are the options for enforcing this constraint when a user attempts to delete a Dept tuple?

b) Write the SQL statements required to create the preceding relations, including appropriate versions of all primary and foreign key integrity constraints.

c) Define the Dept relation in SQL so that every department is guaranteed to have a manager.

d) Write an SQL statement to add John Doe as an employee with *eid* = 101, *age* = 32 and *salary* = 15,000.

e) Write an SQL statement to give every employee a 10 percent raise. [10]

OR

7.a) Explain briefly about Lossless-Join Decomposition and Dependency-Preserving decomposition.

b) Discuss on schema refinement through dependency analysis. [5+5]

8. Describe Multiple-granularity locking protocol and compare it with two-phase locking protocol. [10]

OR

9.a) Explain various data structures used in ARIES recovery technique.

b) Provide the differences between a serial schedule and a serializable schedule. [6+4]

10. Explain various file organization schemes and compare their complexities in doing various operations. [10]

OR

11. Describe Hash-Based Indexing and Tree-Based Indexing techniques with neat representations. [10]

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