

PAPER ID—20331

M.C.A. EXAMINATION, 2024

(Second Semester)

DATABASE MANAGEMENT SYSTEMS

Code : MCA201

Time : 3 Hours

Maximum Marks : 80

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

1. Write short notes on the following : **8×2=16**
- Instances
 - Relational Calculus

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- TCL command in SQL
- Functional Dependency
- Semantic query optimization
- Database Security
- Timestamp
- Shadow paging.

Unit I

2. (i) What is DBMS ? Explain the different characteristics of DBMS. Also compare DBMS with traditional file processing system. **8**
- (ii) What do you mean by relational algebra ? What operators form the complete set of relational algebra operations ? Define join and intersection in term of these operators. **8**
3. (i) What are the different types of database users ? Discuss the main activity of each. **8**

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- (ii) Consider the following set of requirements for a UNIVERSITY database that is used to keep track of students transcripts. **8**
- The university keep track of each student's name, student number, social security number, current address, birth date and gender.
 - Each department is described by a name, department code, office number, office phone, and degree program (B.A, B.Sc) etc.
 - Each section has an instructor, semester, year, course and section number. Design an ER diagram for the above problem. Specify the key attribute of each entity.

Unit II

4. (i) What is a minimal set of functional dependencies ? Does every set of dependencies have a minimal equivalent set? Is it always unique or not ? Explain. **8**

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- (ii) List and explain various types of aggregate functions used in SQL with examples. **8**

5. Consider the following table PLAYER_INFO :

Player ID	Name	Sport Played
1	Virat	Cricket
2	Dhoni	Cricket
3	Sania	Tennis
4	Saina	Badminton
5	Anand	Chess
6	Daksh	Football

- Write the SQL command to create the above table. **4**
- Write SQL command to add one more column AGE to above table. **2**
- Write SQL command to display the details of the player playing 'Cricket.' **2**
- Write SQL command to display the name of Sport Played by 'Sania.' **2**
- Write SQL command to display NAME of the player playing 'CRICKET.' **2**

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- (f) Write SQL command to delete column age. **2**
- (g) Write SQL command to delete the above table. **2**

Unit III

6. (i) Write a short note on database security. **8**
- (ii) What is a transaction ? Explain different properties of a transaction. **8**
7. (i) What is a schedule ? Define the concepts of recoverable, cascade less, and strict schedules, and compare them in terms of their recoverability. **8**
- (ii) What do you mean by query optimization ? Explain cost estimation in query optimization. **8**

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Unit IV

8. (i) What do you understand by concurrency ? Discuss the various problems associated with it in detail. **8**
- (ii) What do you mean by granularity of data items ? Also, explain multiple granularity locking. **8**
9. Explain database recovery techniques in detail. **16**

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