

USN

Course Code

22CS/AI/CA/CD43

Fourth Semester B.E. Degree Examinations, July 2026
DATA BASE MANAGEMENT SYSTEMS

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions choosing ONE full Question from each Module.
2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTl:CO: PI)</u>
<u>Module-1</u>			
1.	a. Explain different database languages and interfaces with suitable examples.	07	(3 :1: 1.2.1)
	b. Discuss the history and evolution of database applications.	06	(3 :1: 1.2.1)
	c. Describe the different actors on the scene and workers behind the scene in a database system.	07	(2 :1: 1.2.1)
(OR)			
2.	a. Compare centralized and client/server architectures for DBMSs. Analyze their advantages and limitations.	07	(3 :1: 1.2.1)
	b. Illustrate the three-schema architecture with a neat diagram and explain how data independence is achieved.	06	(3 :1: 1.2.1)
	c. List the advantages of a Database Management System (DBMS). Explain any five advantages by comparing them with traditional file systems.	07	(2 :1: 1.2.1)
<u>Module-2</u>			
3.	a. Explain structural constraints, weak entities, and relationship types with a neat ER diagram.	08	(2 :2: 1.2.1)
	b. Discuss naming conventions and design issues of ER diagrams.	06	(2 :2: 1.2.1)
	c. What is an attribute? Explain different types of attributes.	06	(2 :2: 1.2.1)
(OR)			
4.	a. Draw an ER diagram for COMPANY database. Assume your own entities (Minimum of 4 entities), attributes and relationship.	08	(2 :2: 1.2.1)
	b. Explain update operations in relational model and issues related to constraint violations.	06	(2 :2: 1.2.1)
	c. Explain the mapping of strong entity types and attributes from ER model to relational model.	06	(2 :2: 1.2.1)
<u>Module-3</u>			
5.	a. Explain ALTER TABLE command. Explain how a new constraint can be added and an existing constraint can be removed using suitable examples.	08	(2 :3: 1.2.1)
	b. Consider following schema for a sailors database Sailors (Sname, Sid, Rating, Age) Reserves (Sid, Bid, day) Boats (Bid, Bname, Color) Write the queries in SQL to:	12	(3 :3: 1.2.1)

Note: (RBTl - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)

- (i) Find the age of the youngest sailor who is eligible to vote for each rating level with at least two such sailors.
- (ii) Find the name of sailors whose rating is better than some sailor called 'xyz'.
- (iii) Find the sides of all sailors who have reserved red boats but not the green boats.

(OR)

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| 6. | a. | Describe the concept of a CURSOR and how it is used in embedded SQL. Illustrate with example. | 08 | (2 :3: 1.2.1) |
| | b. | Consider the following schema for a supplier database
Supplier (Sno, Sname, Status, City)
Product(Pno, Pname, Color, Weight, City)
Shipment(Sno, Pno, Qty)
Write the queries in SQL to
(i) Retrieve the names of supplier who supply part P2.
(ii) Retrieve supplier numbers for suppliers with status less than the current maximum in the supplier table.
(iii) Retrieve the parts number for all parts supplied by more than one supplier. | 12 | (3 :3: 1.2.1) |

Module-4

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| 7. | a. | List the inference rules for functional dependencies. Write the algorithm to determine the closure of X under F. | 10 | (2 :4: 1.2.1) |
| | b. | Consider the relation LOTS with the following functional dependencies :
{PropertyID } → { Countynome , Lot#,Area,Price, Taxrate}
{Countynome , Lot#} → { PropertyID,Area,Price, Taxrate}
{Countynome} → { Taxrate}
{ Area} →{ Price,}
Countynome and lots# are the candidate keys. Normalize the realtion upto 3NF. | 10 | (3 :4: 1.2.1) |

(OR)

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| 8. | a. | Explain the informal quality measures employed for a relational schema. | 10 | (2 :4: 1.2.1) |
| | b. | What are the different techniques to make relation schema satisfy with 1NF. Illustrate with example. | 10 | (3 :4: 1.2.1) |

Module-5

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| 9. | a. | Discuss the two-phase locking protocol used in concurrency control. Illustrate with example. | 10 | (3 :5: 1.2.1) |
| | b. | What is deadlock? With an example, explain deadlock prevention schemes. | 10 | (3 :5: 1.2.1) |

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| 10. | a. | What are the ACID properties? Explain each one with example. | 10 | (3 :5: 1.2.1) |
| | b. | What is serializability? Explain conflict serializable schedule with an example. | 10 | (3 :5: 1.2.1) |

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