

MSc (SS) DEGREE EXAMINATION MAY 2026
(Third Semester)

Branch – **SOFTWARE SYSTEMS (FIVE YEARS INTEGRATED)**

DATABASE MANAGEMENT SYSTEM CONCEPTS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which of the following best describes <i>data independence</i> ? a) The ability to change data without affecting the program b) The ability to modify schema at one level without affecting schema at the next higher level c) The ability to store data without redundancy d) The ability to access data from multiple sources	K1	CO1
	2	Select the correct option : In an Entity-Relationship (ER) model, a <i>weak entity</i> is identified by: a) Its own primary key b) A foreign key from another entity c) A combination of its partial key and owner entity's key d) None of the above	K2	CO1
2	3	Find the correct statement. In a sequential file organization, records are stored and accessed: a) In random order b) In order of their hash key c) In sorted order of a key field d) Using tree structures	K1	CO2
	4	Summarize the primary key in a relational database: a) Can have duplicate values b) Can be NULL c) Must uniquely identify each tuple in a relation d) Is used only for sorting	K2	CO2
3	5	Define trigger in PL/SQL a) A stored procedure that runs automatically in response to an event b) A function that returns a value c) A program that executes only manually d) None of the above	K1	CO3
	6	What is the use of GROUP BY clause in SQL a) Restrict the number of rows in the result b) Sort the data in ascending order c) Eliminate duplicate rows d) Combine rows with identical values into summary rows	K2	CO3
4	7	Which is the stronger version of Boyce–Codd Normal Form (BCNF): a) 2NF b) 3NF c) 4NF d) 5NF	K1	CO4
	8	Interpret the meaning functional dependency $X \rightarrow Y$ a) X and Y are independent attributes b) Y determines X c) The value of X determines the value of Y d) X and Y have no relationship	K2	CO4
5	9	Choose the best answer : In database security, Mandatory Access Control (MAC) is based on: a) User identity and ownership b) Labels and security levels assigned to data and users c) User-granted privileges d) None of the above	K1	CO5
	10	Which of the following is a concurrency control technique? a) Time stamping, Indexing b) Locking, Indexing c) Time stamping, Locking d) Deadlock	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Identify the three levels of data abstraction in a database system and explain how they contribute to data independence.	K3	CO1
		(OR)		
	11.b.	Apply the concept of entity, attribute, and relationship and explain with suitable examples. Explain the different types of relationships that can exist between entities.		
2	12.a.	List and explain the different types of file organizations with suitable examples.	K4	CO2
		(OR)		
	12.b.	Inspect the different types of data integrity constraints enforced in a relational model. Why are they essential for maintaining database consistency?		
3	13.a.	Make use of Views in SQL and Discuss how they enhance data security and simplify query management, with an example	K3	CO3
		(OR)		
	13.b.	Identify aggregate and scalar functions in SQL? Explain any four aggregate functions with examples.		
4	14.a.	Classify the anomalies in database design? Explain insertion, update, and deletion anomalies with examples.	K4	CO4
		(OR)		
	14.b.	Analyze the Armstrong's axioms used for inferring functional dependencies.		
5	15.a.	Interpret different locking techniques used in transaction management. How does a lock-based protocol ensure serializability?	K5	CO5
		(OR)		
	15.b.	Explain the ACID properties of a database transaction. Why are they important for maintaining consistency?		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Build the three-schema architecture and explain in detail.	K3	CO1
2	17	Examine the Relational Algebra Operations used in the relational model with suitable example.	K4	CO2
3	18	Explain the purpose and syntax of procedures, functions, and triggers in PL/SQL, providing suitable examples for each.	K5	CO3
4	19	Solve the following relation Vendor (ID, Name, Account_No, Bank_Code_No, Bank) Identify the Functional Dependencies and normalize the table till 3NF.	K6	CO4
5	20	Examine the various security threats to databases and the defense mechanisms and also explain how integrity constraints maintain consistency in multi-user database environments.	K4	CO5

Z-Z-Z

END