

Model Question Paper- II with effect from 2022

CBCS SCHEME

Fourth Semester B.E Degree Examination 2024-25

Database Management System (BCS403)

TIME: 03 Hours

Max.Marks:100

- Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**
- M: Marks, L: Bloom's level, C: Course outcomes.

		Module - 1	M	L	C
Q.1	a	What is a Database? Explain the three schema architecture with neat diagram.	8	L2	CO1
	b	What are the advantages of using DBMS approach? Explain	8	L2	CO1
	c	Explain the following terms. 1. Data Dictionary 2. Weak Entity	4	L2	CO1
		OR			
Q.2	a	Explain the categories of Data Models.	8	L2	CO1
	b	Explain the component modules of DBMS & their interactions with diagram.	8	L2	CO1
	c	What are the responsibilities of DBA & database designers?	4	L2	CO1
		Module - 2			
Q.3	a	Explain the different types of update operations on relational database. How basic operation deals with constraint violation.	6	L2	CO2
	b	Explain Unary relational operations with examples.	6	L2	CO2
	c	What is an Integrity Constraint? Explain the importance of Referential Integrity Constraint.	8	L2	CO2
		OR			
Q.4	a	Explain the following relational algebra operation. JOIN, DIFFERENCE, SELECT, UNION	10	L3	CO2
	b	Discuss the E.R to Relational mapping algorithm with example for each step.	6	L3	CO2
	c	Explain the relational algebra operation for set theory with examples.	4	L2	CO2
		Module - 3			
Q.5	a	Illustrate insert, delete, update, alter & drop commands in SQL.	6	L4	CO3

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	b	Explain informal design guidelines for relational schema design.	4	L2	CO3
	c	What is Functional dependency? Explain the inference rules for functional dependency with proof.	10	L3	CO4
OR					
Q.6	a	Consider two sets of functional dependency. $F = \{A \rightarrow C, AC \rightarrow D, E \rightarrow AD, E \rightarrow H\}$ $E = \{A \rightarrow CD, E \rightarrow AH\}$. Are they Equivalent?	10	L3	CO4
	b	Explain the types of update anomalies in SQL with an example.	10	L2	CO3
Module - 4					
Q.7	a	Demonstrate transaction states & additional operations.	10	L3	CO4
	b	Demonstrate working of Assertion & Triggers in database? Explain with an example.	10	L2	CO3
OR					
Q.8	a	Demonstrate the System Log in database transaction.	6	L2	CO4
	b	Discuss the ACID properties of database transaction.	4	L2	CO4
	c	Explain stored procedure language in SQL with an example.	10	L2	CO3
Module - 5					
Q.9	a	Explain the Two phase locking protocol used for concurrency control.	8	L3	CO5
	b	Define Schedule? Illustrate with an example.	4	L2	CO5
	c	Why Concurrency control is needed? Demonstrate with an example.	8	L3	CO5
OR					
Q.10	a	What is NOSQL? Explain the CAP theorem.	6	L2	CO5
	b	What are document based NOSQL systems? basic operations CRUD in MongoDB.	8	L2	CO5
	c	What is NOSQL Graph database? Explain Neo4j.	6	L2	CO5

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		Module - 1	M	L	C
Q.1	a	Explain the types of end users with examples.	8	L2	CO1
	b	What are the advantages of using DBMS? Explain.	8	L2	CO1
	c	Describe the characteristics of database.	4	L2	CO1
		OR			
Q.2	a	Explain three schema architecture. Why mappings b/w schema levels are required?	8	L2	CO1
	b	Explain the different types of attributes in ER model.	8	L2	CO1
	c	Explain the following. 1. Cardinality Ratio 2. Weak Entity	4	L2	CO1
		Module - 2			
Q.3	a	Explain the different Relational Model constraints.	6	L2	CO2
	b	Demonstrate the concepts of Generalization & Specialization with examples.	6	L2	CO2
	c	Explain Entity Integrity Constraint & Referential Integrity Constraints? Why each of these is important in a database.	8	L2	CO2
		OR			

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Q.4	a	Consider the Sailors-Boats-Reserves DB described s (sid, sname, rating, age) b (bid, bname, color) r (sid, bid, date) Write each of the following queries in SQL. 1. Find the colors of boats reserved by Alber. 2. Find all sailor ids of sailors who have a rating of at least 8 or reserved boat 103. 3. Find the names of sailors who have not reserved a boat whose name contains the string “storm”. Order the names in ascending order. 4. Find the sailor ids of sailors with age over 20 who have not reserved a boat whose name includes the string “thunder”.	10	L3	CO2
	b	Discuss the Equijoin & Natural Join with suitable example.	6	L3	CO2
	c	Explain the relational algebra operation for set theory with examples.	4	L2	CO2
Module - 3					
Q.5	a	Explain the Cursor & its properties in embedded SQL with an example.	6	L2	CO3
	b	What is a Normalization? Explain the 1NF, 2NF & 3NF with examples.	10	L2	CO4
	c	Explain informal design guidelines for relational schema design.	4	L2	CO3
OR					
Q.6	a	What is Functional Dependency? Write algorithm to find minimal cover for set of Functional Dependency. Construct the minimal cover m for set of functional dependency. $E = \{ B \rightarrow A, D \rightarrow A, AB \rightarrow D \}$	10	L2	CO4
	b	Explain the types of update anomalies in SQL with an example.	10	L4	CO3
Module - 4					
Q.7	a	Demonstrate the Database Transaction with transaction diagram.	10	L2	CO4
	b	Demonstrate working of Assertion & Triggers in SQL? Explain with an example.	10	L3	CO3
OR					
Q.8	a	Demonstrate the System Log in database transaction.	6	L2	CO4
	b	Demonstrate the ACID properties of database transaction.	4	L2	CO4
	c	Explain stored procedure language in SQL with an example.	10	L2	CO3

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Module - 5					
Q.9	a	Demonstrate the Two phase locking protocol used for concurrency control.	8	L3	CO5
	b	Demonstrate the Concurrency control based on Timestamp ordering.	4	L2	CO5
	c.	Why Concurrency control is needed? Demonstrate with an example.	8	L3	CO5
OR					
Q.10	a	What is NOSQL? Explain the CAP theorem.	6	L2	CO5
	b	What are document based NOSQL systems? Explain basic operations CRUD in MongoDB.	8	L2	CO5
	c	What is NOSQL Graph database? Explain Neo4j.	6	L2	CO5