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*

1. *Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE***
2. *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→C, AC→D, E→AD, E→H} E= {A→CD, E→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. Weal 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→A, D→A, AB→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**