CBCS SCHEME

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BCD515C

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
NoSQL Databases

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Explain why relational databases become dominant and what limitations led to the rise of NoSQL databases.	10	L2	CO1
	b.	Bring about graph database and mention its uses.	10	L2	CO1
		OR			
Q.2	a.	Write short notes on : i. Key value data model ii. Column family store iii. Document data model iv. Consequences of aggregate orientation.	10	L2	CO1
	b.	What are materialized views, and how they differ from relational views in terms of data access? What strategies are used to build materialized views.	10	L2	CO1
		Module – 2			
Q.3	a.	Explain the following with a neat diagram : i. Master –slave replication ii. CAP theorem.	10	L2	CO1
	b.	Define Quorum. Explain read quorum and write quorum with examples.	10	L2	CO1
		OR			
Q.4	a.	In a distributed inventory system, the product "Laptop" has the following details : Price : Rs. 60,000, Stock :10, version stamp : V1, Example : user A updates the price to Rs. 50,000 and user B updates to Rs. 45,000 at same time. For this example how different version stamping method be applied to track these updates, and what are the advantages and disadvantages of each method.	10	L3	CO2
	b.	What is Sharding? With a neat diagram explain the concept of sharding with an example.	10	L2	CO2
		Module – 3			
Q.5	a.	Apply the Map-Reduce process to compare the sales of products for each month in 2011 to the prior year. Illustrate the process with suitable diagram.	10	L3	CO3
	b.	What are key value stores and popular key value databases? Discuss with an example how data is organized within a single bucket and mention ways to handle – key conflicts.	10	L2	CO3
		OR			
Q.6	a.	Explain partitioning and combining stages with example.	10	L2	CO3
	b.	i. Consider the following scenario. A NoSQL database has a replication factor (N) of 4, write quorum (w) of 2, and read quorum (R) of 3. Determine if the system guarantees strongly consistent reads and explain your reasoning. ii. Explain how the Map reduce function process data to calculate Sum and Average.	10	L3	CO3

		Module – 4			
Q.7	**a.**	What is a replica set? How does replication work in MongoDB? What are the alternatives to MangoDB?	**8**	**L2**	**CO4**
	b.	Briefly explain the scaling features in document databases with a neat diagram.	**7**	**L2**	**CO4**
	c.	Explain a few applications where document databases should not be used.	**5**	**L2**	**CO4**
		OR			
Q.8	**a.**	What is a document database? Explain with an example how data is stored in it and how it differs from an RDBMS.	**8**	**L2**	**CO4**
	b.	Explain the differences in query handling between MongoDB and RDBMS.	**7**	**L2**	**CO4**
	c.	List and explain the suitable use cases for document databases.	**5**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	Discuss the three scaling method in graph databases with a clear diagram.	**8**	**L2**	**CO5**
	b.	List and explain applications where graph databases are suitable and not suitable.	**6**	**L2**	**CO5**
	c.	With an example graph structure, discuss how relationships are handled in a graph database compared to an RDBMS.	**6**	**L2**	**CO5**
		OR			
Q.10	**a.**	Describe the query features of graph databases in detail with examples.	**8**	**L2**	**CO5**
	b.	What is graph database? Explain how relationships and properties are represented in a graph, with neat diagram.	**6**	**L2**	**CO5**
	c.	Explain transaction, consistency and availability with respect to graph databases.	**6**	**L2**	**CO5**

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