

Model Question Paper-I with effect from 2021 (CBCS Scheme)

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Seventh Semester B.E. Degree Examination NOSQL Database

TIME: 03 Hours

Max. Marks: 100

Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Module -1			Bloom's Taxonomy Level	Marks
Q.01	a	What is NoSQL? Discuss and differentiate between the relational model and the aggregate model.	L2	7
	b	Which data model does not support aggregate orientation? Explain the model with a suitable diagram.	L2	6
	c	Define key-value stores and explain the differences between key-value and document data models.	L2	7
OR				
Q.02	a	Describe with an example how column family stores data in the aggregate structure.	L2	6
	b	Explain briefly how impedance mismatch occurs in the relational model, and what are some common solutions to address it?	L2	7
	c	What are materialized views, and how do they differ from relational views in terms of data access? What strategies are used to build materialized views?	L2	7
Module-2				
Q. 03	a	Define Master-Slave replication. With a neat diagram, explain the advantages and disadvantages of master-slave replication.	L2	7
	b	In a distributed inventory system, the product "Laptop" has the following details: Price: ₹60,000, Stock: 10, Version Stamp: v1. Example: User A updates the Price to ₹50000, and User B updates it to ₹45000 at the same time. For this example, how can different version stamping methods be applied to track these updates, and what are the advantages and disadvantages of each method?	L3	7
	c	What is the CAP theorem? Explain the trade-offs between its three properties in detail.	L2	6
OR				
Q.04	a	Identify the type of conflict in the given scenario. How can it be solved? Alice and Bob both try to book the last available room at the same time. Alice starts filling in her details, but Bob completes his booking first. When Alice submits her booking, it overwrites Bob's reservation, and the room is booked for Alice instead.	L3	7
	b	What is Sharding? With a neat diagram, explain the concept of sharding with an example.	L2	7
	c	Define Quorum. Explain how to read and write a quorum with examples.	L2	6
Module-3				
Q. 05	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 diagrams.	L3	10
	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.	L2	10
OR				
Q. 06	a	Given the following sales data, use the MapReduce process to calculate		

		the total sales for each product. Discuss in detail how the Map and Reduce processes work to compute the total sales. Data:																										
		<table border="1"> <thead> <tr> <th>Customer_Id</th> <th>Product</th> <th>Quantity</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Puerh</td> <td>8</td> <td>24</td> </tr> <tr> <td>2</td> <td>Dragonwell</td> <td>12</td> <td>24</td> </tr> <tr> <td>3</td> <td>Genmaicha</td> <td>20</td> <td>80</td> </tr> <tr> <td>4</td> <td>Puerh</td> <td>5</td> <td>15</td> </tr> <tr> <td>5</td> <td>Dragonwell</td> <td>16</td> <td>48</td> </tr> </tbody> </table>	Customer_Id	Product	Quantity	Price	1	Puerh	8	24	2	Dragonwell	12	24	3	Genmaicha	20	80	4	Puerh	5	15	5	Dragonwell	16	48	L3	10
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	b	Explain the features of key-value stores.	L2	10																								
Module-4																												
Q. 07	a	What is a document database? Explain with an example how data is stored in it and how it differs from an RDBMS.	L2	7																								
	b	List and explain the suitable use cases for document databases.	L2	5																								
	c	Explain the differences in query handling between MongoDB and RDBMS with examples.	L2	8																								
OR																												
Q. 08	a	What is a replica set? How does replication work in MongoDB? What are the alternatives to MongoDB?	L2	7																								
	b	Briefly explain the scaling feature in document databases with a neat diagram.	L2	8																								
	c	Explain a few applications where document databases should not be used.	L2	5																								
Module-5																												
Q. 09	a	What is a graph database? Explain how relationships and properties are represented in a graph, with a neat diagram.	L2	6																								
	b	Explain transaction, consistency and availability with respect to graph databases.	L2	6																								
	c	Describe the query features of graph databases in detail with examples.	L2	8																								
OR																												
Q. 10	a	Discuss the three scaling methods in graph databases with a clear diagram.	L2	8																								
	b	List and explain applications where graph databases are suitable and not suitable.	L2	6																								
	c	With an example graph structure, discuss how relationships are handled in a graph database compared to an RDBMS	L2	6																								