

Reg. No.

Question Paper Code

11909

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023

Sixth Semester

Information Technology

20ITEL609 - NoSQL DATABASE TECHNIQUES

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

- | | <i>Marks,
K-Level, CO</i> |
|--|-------------------------------|
| 1. State the difference between relational database and NoSQL database? | 2,K2,CO1 |
| 2. What is an aggregate-oriented database? | 2,K1,CO1 |
| 3. What is the purpose of replication in a NoSQL database? | 2,K2,CO3 |
| 4. Why we should not use complex transactions in NoSQL database? | 2,K2,CO3 |
| 5. What are the key features of a column-family data store? | 2,K1,CO4 |
| 6. How does Apache HBase scale handle large datasets? | 2,K2,CO4 |
| 7. How does Riak function work in NoSQL key-value database? | 2,K2,CO5 |
| 8. Write a query to update the values of multiple fields for a set of documents in a NoSQL collection. | 2,K2,CO5 |
| 9. What is a Graph Database? | 2,K1,CO6 |
| 10. What are the key features of Neo4j graph database? | 2,K1,CO6 |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) (i) How do developers typically access and retrieve persistent data from relational databases, and what are the common techniques and tools used for this purpose? 6,K3,CO1
(ii) What are the challenges and considerations required to handle concurrency in database systems, especially in scenarios where multiple users or processes are simultaneously accessing and modifying data? 7,K2,CO1

OR

- b) Explain the key-value and document data models used in NoSQL databases and provide examples of situations where each model is beneficial. 13,K2,CO1

12. a) How does replication works in NoSQL databases? What are the different replication models commonly used and write their benefits? 13,K2,CO3

OR

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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- b) (i) What are the query features of NoSQL database, and how it is differ from relational database? *6,K2,CO3*
(ii) How NoSQL database can be utilized for real-time analytics applications? What are the advantages and considerations of using NoSQL database in this scenario? *7,K2,CO3*
13. a) Explain Column oriented database using Apache HBase, its architecture and how it organizes data into column families. *13,K2,CO4*
OR
b) What query features available in Apache HBase? How does it support querying data based on column families and how does it handle indexing and filtering? *13,K2,CO4*
14. a) (i). What is the concept of a key-value store in the context of NoSQL databases? How does it differ from other database models? *8,K2,CO5*
(ii) How does Riak ensure consistency in a distributed key-value database system? *5,K2,CO5*
OR
b) (i) Explain in detail about multioperation transaction. *5,K2,CO5*
(ii) Write the Queries for the following Operations: *8,K2,CO5*
- Update multiple documents in a NoSQL database using a single query.
 - Write the syntax for deleting a group of documents based on a specific condition in a NoSQL database.
 - Retrieve a subset of documents that match a specific set of criteria from a NoSQL collection.
 - Retrieve distinct values from a specific field across multiple documents in a NoSQL database.
15. a) (i) Mention some popular NoSQL database development tools and programming languages used in Graph databases? *7,K2,CO6*
(ii) How does Neo4j ensure consistency in a distributed graph database system? *6,K2,CO6*
OR
b) (i) What query features are available in Neo4j's graph database model? *7,K2,CO6*
(ii) How does Neo4j handle routing and dispatch in location-based services? *6,K2,CO6*

PART - C (1 × 15 = 15 Marks)

16. a) Define Key Value Stores. Explain in detail the features and use cases of Riak database. *15,K2,CO2*
OR
b) What is MapReduce? Illustrate with simple examples the working of MapReduce. *15,K2,CO2*