Reg. No.															

Question Paper Code	13514

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Sixth Semester

Information Technology

20ITEL609 - NoSQL DATABASE TECHNIQUES

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Which NoSQL database is best known for its ability to scale horizontally? (a) MongoDB (b) MySQL (c) Cassandra (d) Neo4j	1	K1	CO1
2.	What is the primary role of a NoSQL database? (a) Store data in tables (b) Store data in a flexible format (c) Provide relational data (d) Maintain data integrity	1	K1	CO1
3.	What is the primary purpose of sharding in databases? (a) To replicate data across multiple servers (b) To partition data to distribute across multiple servers (c) To ensure high availability of data (d) To enforce data consistency across the system	1	K2	CO2
4.	In the context of MapReduce, which phase is responsible for distributing the work across multiple nodes? (a) Map phase (b) Shuffle phase (c) Reduce phase (d) Distribute phase	1	K2	CO2
5.	Which of the following is a key feature of MongoDB's data model? (a) Data is stored as rows and columns (b) Data is stored in JSON-like documents (c) Data is stored in tables with predefined schemas (d) Data is stored in graphs and nodes	1	K1	CO3
6.	Which of the following best describes MongoDB's consistency model? (a) Strong consistency (b) Eventual consistency (c) Consistency on-demand (d) Consistency is disabled in MongoDB	1	K2	CO3
7.	Which of the following features is common to both Apache HBASE and Apache CASSANDRA? (a) Strong ACID compliance (b) Suitable for complex joins (c) Distributed architecture for scalability (d) Relational schema enforcement	1	K2	CO4
8.	Which feature allows Apache CASSANDRA to handle time-based data effectively? (a) Gossip protocol (b)Tunable consistency (c) Time-to-live(TTL) (d) MemStore	1	K2	CO4
9.	In a key-value database, what does the key represent? (a) A unique identifier (b) A data value (c) A table name (d) A database schema	1	K2	CO5
10.	In Neo4j, what does a "Node" represent? (a) A table of data (b) An individual entity or object in the graph (c) The relationship between two entities (d) A key-value pair storing data	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11.	List any four benefits of NoSQL stores.	2	K1	CO1
12.	Give the difference between structured versus unstructured data.	2	K1	CO1

13.	Outline Master-Slave Replication with a sketch.	*2*	*K2*	*CO2*
14.	Define Peer to peer Replication.	*2*	*K1*	*CO2*
15.	Enumerate the uses of MongoDB.	*2*	*K2*	*CO3*
16.	Discuss the reasons why document database cannot be used in case of queries against varying aggregate structure.	*2*	*K2*	*CO3*
17.	Mention any one suitable real world use case of CASSANDRA.	*2*	*K2*	*CO4*
18.	Brief about Super Column family.	*2*	*K2*	*CO4*
19.	List down the merits and demerits of RIAK.	*2*	*K1*	*CO5*
20.	Outline the structure of data stored as a key value store.	*2*	*K1*	*CO5*
21.	Write the cypher syntax to create an index on the ID property for nodes with the customer label.	*2*	*K2*	*CO6*
22.	Name the suitable use cases of Neo4j for routing, dispatch, and location-based services.	*2*	*K1*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain briefly about aggregate data models with a neat diagram and examples.	*11*	*K2*	*CO1*
		OR			
	b)	Give a brief note about four types of NoSQL stores with respect to its usage.	*11*	*K2*	*CO1*
24.	a)	Define Replication and Sharding. Explain in detail the various styles of distributing the data.	*11*	*K2*	*CO2*
		OR			
	b)	Enumerate the usage of CAP theorem and BASE theorem in implementing the NoSQL stores.	*11*	*K2*	*CO2*
25.	a)	Illustrate how NoSQL databases handle the order processing and transactions for e-commerce applications.	*11*	*K2*	*CO3*
		OR			
	b)	Describe the key features of NoSQL document databases for web analytics with an example.	*11*	*K2*	*CO3*
26.	a)	Discuss on query features and transaction control of CASSANDRA.	*11*	*K2*	*CO4*
		OR			
	b)	Eloborate on the architecture of HBASE and explain the data models used in HBASE with neat sketch.	*11*	*K2*	*CO4*
27.	a) i)	Convert the below student relation into Key Value database schema using RIAK.	*5*	*K3*	*CO5*

Stud ID	Stud Name	S Phone	S B_Date
1011	Anna	18005261928	1/1/2002
1012	Belle	18005364782	12/3/2002
1013	Cyan	18005698752	4/8/2002
1014	Denver	18005698745	16/12/2002

	ii)	Identify five suitable use cases for RIAK in real-world scenarios.	*6*	*K3*	*CO5*
		OR			
	b)	Enumerate how consistency and transaction is achieved in RIAK.	*11*	*K3*	*CO5*
28.	a)	Compose the need for a graph database. Brief the features of Neo4j's architecture.	*11*	*K3*	*CO6*
		OR			

b) i) Consider the following Neo4j Cypher *5 K3 CO6*

```
CREATE ((
sue:Person {name:”Sue”},
anna:Person {name:”Anna”},
joe:Person {name:"Joe"}),
bob:Person {name:"Bob"}),
sue-[:KNOWS]->bob ,
sue-[:KNOWS]->anna ,
sue-[:KNOWS]->joe ,
joe-[:KNOWS]->anna)
```

Draw the property graph diagram that would result from executing the command.

ii) Write a cypher query that reports the common friends of Anna and Joe. Report the query and the result of running it in the created database. *6 K3 CO6*