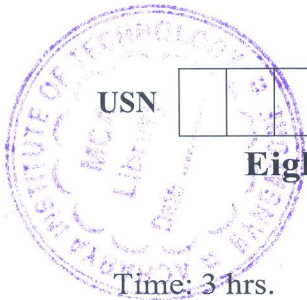


CBCS SCHEME



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18CS823

Eighth Semester B.E. Degree Examination, June/July 2023

NOSQL Database

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the evolution of databases from object oriented databases to NOSQL databases. (10 Marks)
- b. Which data model does not support aggregate orientation? Differentiate between key value and document oriented data models. (05 Marks)
- c. Use the above graphical representation and answer the following questions with justification [Refer Fig.Q1(c)] :

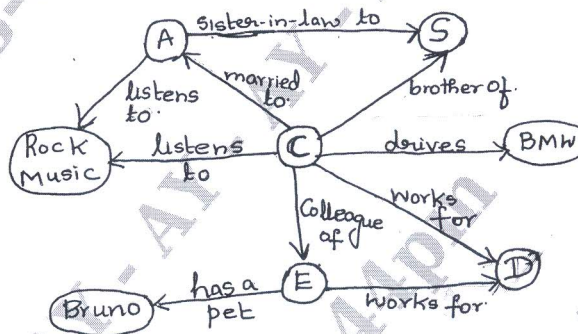


Fig.Q1(c)

- i) Who listens to rock music and works for D?
- ii) Who works for D and has a married colleague?
- iii) Who listen to rock music?
- iv) How are A and S related to each other and also to C?
- v) What are the genders of C and A? (05 Marks)

OR

- 2 a. Define impedance mismatch. Briefly explain the advantages of relational databases. (05 Marks)
- b. Define materialized view. How are they different from views? Briefly explain the two main strategies to build a materialized view. (09 Marks)
- c. Explain the data arrangement and access in column family data stores with example. (06 Marks)

Module-2

- 3 a. Compare the similarities and differences between single server and master slave data distribution model. (06 Marks)
- b. Identify the type of conflict in the following scenario. How can it be solved? Alice and Bob share a common google sheet Online Both read the file. Alice updates the document and forgets to save the file. On the other end Bob updates the Google sheet and saves the file. The content updated by Alice is overwritten by Bob. The data updated by Alice is lost. (09 Marks)
- c. List and explain the approaches through which version stamps can be constructed for a single authoritative source for data models. (05 Marks)

OR

- 4 a. Compare the similarities and difference between sharding and peer to peer data distribution models. (06 Marks)
- b. Define quorum. Explain read quorum and write quorum with examples. (09 Marks)
- c. List and explain the approaches through which version stamps for multiple nodes data models. (05 Marks)

Module-3

- 5 a. Explain Mappers and Reducers with examples. (10 Marks)
- b. Explain the features of Key-value stores. (10 Marks)

OR

- 6 a. Explain partitioning and combining stages with examples. (10 Marks)
- b. Define key-value stores. Explain the data storage in Riak with limitations and solution to overcome the limitation. (05 Marks)
- c. Explain how data can be read and posted from and to the bucket using queries in Riak. (05 Marks)

Module-4

- 7 a. What is document database? Give examples of any document that can be stored into it and explain. (05 Marks)
- b. Explain consistency and availability in MongoDB with neat diagram for configuration of replica sets. (10 Marks)
- c. List and explain briefly the applications of document databases. (05 Marks)

OR

- 8 a. With suitable diagrams, explain
- horizontal sharding in MongoDB for adding a new node to an existing replica-set. (08 Marks)
 - each shard is a replica set. (08 Marks)
- b. With examples differentiate between queries written in SQL and its equivalent query in Mongo Shell. (08 Marks)
- c. Explain few cases where document databases are not useful. (04 Marks)

Module-5

- 9 a. Explain graph database. With a neat diagram, explain relationships with properties in a graph. (06 Marks)
- b. Explain Query features in detail with examples. (10 Marks)
- c. List and explain use cases where graph databases are very useful. (04 Marks)

OR

- 10 a. With a neat diagram, explain the three ways in which graph databases can be scaled. (10 Marks)
- b. Explain Consistency, Transactions and availability with respect to graph databases. (06 Marks)
- c. With a neat example diagram, explain the terms property, relationships and traversing a graph with a query. (04 Marks)
