# UNIT V

# DBMS

1. What are NoSQL databases? What are the different types of NoSQL databases?

A NoSQL database provides a mechanism for storage and retrieval of data that is modeled in means other than the tabular relations used in relational databases (like SQL, Oracle, etc.).

Types of NoSQL databases:

- Document Oriented
- Key Value
- Graph
- Column Oriented

2. What do you understand by NoSQL databases? Explain.

At the present time, the internet is loaded with big data, big users, big complexity etc. and also becoming more complex day by day. NoSQL is answer of all these problems; It is not a traditional database management system, not even a relational database management system (RDBMS). NoSQL stands for “Not Only SQL”. NoSQL is a type of database that can handle and sort all type of unstructured, messy and complicated data. It is just a new way to think about the database.

3. Explain difference between scaling horizontally and vertically for databases

- Horizontal scaling means that you scale by adding more machines into your pool of resources whereas
- Vertical scaling means that you scale by adding more power (CPU, RAM) to an existing machine.

In a database world horizontal-scaling is often based on the partitioning of the data i.e. each node contains only part of the data, in vertical-scaling the data resides on a single node and scaling is done through multi-core i.e. spreading the load between the CPU and RAM resources of that machine.

Good examples of horizontal scaling are Cassandra, MongoDB, Google Cloud Spanner. and a good example of vertical scaling is MySQL - Amazon RDS (The cloud version of MySQL).

4. What are the advantages of NoSQL over traditional RDBMS?

**NoSQL is better** than RDBMS because of the following reasons/properities of NoSQL:

- It supports semi-structured data and volatile data
- It does not have schema
- Read/Write throughput is very high
- Horizontal **scalability** can be achieved easily
- Will support Bigdata in volumes of Terra Bytes & Peta Bytes
- Provides good support for Analytic tools on top of Bigdata
- Can be hosted in cheaper hardware machines
- In-memory caching option is available to increase the performance of queries
- Faster development life cycles for developers

Still, **RDBMS is better** than NoSQL for the following reasons/properties of RDBMS:

- Transactions with **ACID** properties - Atomicity, Consistency, Isolation & Durability
- Adherence to **Strong Schema** of data being written/read
- Real time query management ( in case of data size < 10 Tera bytes )
- Execution of complex queries involving **join** & **group by** clauses

5. When should we embed one document within another in MongoDB?

You should consider embedding documents for:

- *contains* relationships between entities
- One-to-many relationships
- Performance reasons