Q1 What is NoSQL ? Explain the importance of NoSQL with advantages.

Ans NoSQL data models allow related data to be nested within a single data structure.

→ NoSQL database stands for "Not Only SQL" or "Not SQL".

→ NoSQL is a non-relational DMS, that does not require a fixed schema, avoids joins, and is easy to scale.

→ NoSQL is used for Big data & real-time web apps.

→ The purpose of using a NoSQL database is for distributed data stores with humongous data storage needs.

Importance of NoSQL :-

1 Availability → You may encounter varieties of relational databases for dealing with the data transaction but the NoSQL databases are perfect in it.
→ This continuous availability makes them manage

various kinds of data transactions even in complex sceneries.

2. Latency - Rate → Another good things about the NoSQL database is — it has a low latency rate.
→ the data can be accessed in very less time through easy steps.
→ the are fast enough to manage modern application-oriented operations.

3. Easy to Scale → NoSQL provides the easiest ways to scale database resources as per current or upcoming needs.
→ they can be partitioned among various servers to fulfill ⓣed storage demands.
→ And the best part is — the required hardware are not that expensive as in the case of SQL databases scaling.

4. Can manage changes → Schema-less NoSQL can easily manage changes from time to time. It leverages the universal index available for values, structures from the data, so it becomes easy for it to manage changes very quickly.

Advantages :-

- Zero downtime and not a single point of failure.
- It can be easily replicated & is simple to implement.
- It can deal with all kinds of data - structured, semi-structured, unstructured.
- Scalability is performed horizontally with quick performance.
- It doesn't require any seperate layer for the cache.
- They dont require expensive, high-performance servers for execution.
- It has the ability to handle distributed database operations.

Q2. Compare relational database with NoSQL database.

Ans.

Relational Database	NoSQL Database
1. Structured Query language [SQL].	1. No declarative Query language.
2. Handles data coming in low velocity.	2. High velocity
3. Manages structured data.	3. Manages structured unstructured & semi-structured data.
4. Support complex transactions.	4. Support simple transaction
5. single point of failure.	5. No single point of failure.
6. Transaction written in one location.	6. Transactions written in many location.
7. Gives read scalability.	7. Gives both read & write scalability.
8. Relational db are vertically scalable	8. NoSQL db are horizontally scalable.
9. R.db have a pre-defined schema.	9. NoSQL db use dynamic schema for unstructured data.
10. Example — Oracle, Postgres & MS-SQL.	10. Ex — MongoDB, Redis, Hbase.

Q3 Define MongoDB. Describe the datatypes in mongodb.

Ans MongoDB — MongoDB is a document-oriented NoSQL database used for high volume data storage.

→ MongoDB is a database which came into light around the mid-2000s.

→ It falls under the category of a NoSQL database.

→ MongoDB is a cross-platform, document oriented database that provides, high performance, high availability, & easy scalability.

→ MongoDB works on concept of collection and collection.

Datatypes :-

1. String — This is the most commonly used datatype to store the data. String in Mongodb must be UTF-8 valid.

2. Integer — This type is used to store a numerical value. Integer can be 32 bit or 64 bit depending upon your server.

3. Boolean — This type is used to store a boolean value. [T/F]

4. Double — This type is used to store floating point values.

5. Min/Max keys — This type is used to compare a value against the lowest & highest BSON elements.

6. Arrays — This type is used to store arrays or list or multiple values into one key.

7. Timestamp — ctimestamp. This can be handy for recording when a document has been modified or added.

8. Object — This datatype is used for embedded documents.

9. Null — This type is used to store a Null value.

10. Symbol — This datatype is used identically to a string; however, it's generally reserved for languages that use a specific symbol type.

11. Date — This datatype is used to store the current date or time in UNIX time format. You can specify your own date time by creating object of Date &

passing day, month, year into it.

12. Object ID — This datatype is used to store the documents ID.

13. Binary Data — This datatype is used to store binary data.

14. Code — This datatype is used to store JavaScript code into the document.

15. Regular Expression — This datatype is used to store regular expression.

Q4 Explain CRUD operation of mongodb with example.

Ans CRUD → The CRUD paradigm is common in constructing web applications, becoz it provides a memorable framework for reminding developers of how to construct full, usable models.

CRUD Operation —

1. Create Operation → Create or insert operations add new documents to a collection. If the collection does not currently exist, insert operations will create the collection.

Method — db.collection.insertOne()
db.collection.insertMany()

2. Read Operation → Read operation retrives documents from a collection; i.e. queries a collection for documents.

Method — db.collection.find()

3. Update Operation → Update operations modify existing document in a collection.

Method – db.collection.updateOne()
db.collection.updateMany()
db.collection.replaceOne().

4. Delete Operation → Delete operations remove documents from a collection.

Method – db.collection.deleteOne()
db.collection.deleteMany().

Q5. What is JSON ? Explain uses of JSON in detail.

Ans JSON → JavaScript Object Notation, is a minimal, readable format for structing data.

→ It is used primarily to transmit data b/w a server and web application, as an alternative to XML.

→ Squarespace uses JSON to store & organize site content created with the CMS.

→ JSON is a syntax for storing and exchanging data.

→ JSON is text, written with JavaScript object notation.

→ When exchanging data b/w a browser & server, the data can only be text.

→ JSON is a lightweight data-interchange format.

→ JSON is "self-describing" & easy to understand.

→ JSON is language independent.

→ The JSON format is syntactically identical to the code for creating JavaScript objects.

→ Its file name extension for written programming code is — .json.

→ It was designed for human-readable data Interchange.
→ It has been extended from the Javascript scripting language.
→ The filename extension .json

Uses of JSON —

- It is used while writing Javascript based applications that includes browser extensions & websites.
- JSON format is used for serializing & transmitting structured data over network connection.
- It is primarily used to transmit data b/w a server & web application.
- Web services and API's use JSON format to provide public data.
- It can be used with programming languages.