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DATA BASE MS

1) What is SQL?

⇒ Abbreviated as "Structured Query Language"

- It is used to communicated with database i-e accessing and manipulating database, especially in a relational database management system.

2) What is NoSQL?

⇒ Abbreviated as "Not Only SQL"

- It is also used to communicated with database.
- Its databases are non-Tabular database.
- It stores data not in the form of tables rather in document, key-value, graph.

3) What is difference b/w sql and NOsql?

SQL	NoSQL
Relational database	Non Relational db
Predefined schema	dynamic schema
Structured data	Unstructured data

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4) Which one is faster SQL or NoSQL?

As data is stored together in NoSQL, it means that its faster to perform read or write operations on one data. So NoSQL is more faster.

5) What are the advantages of SQL over NoSQL?

SQL are better for multi-row transaction. It will give or update or delete multiple rows data at the same time with one query.

6) where to use SQL and NoSQL?

Where you need scalability (handle increasing overload) and flexibility (system to be adapted to changing needs) you should use noSQL. Moreover, if your system needs read and write operations majorly then go with it as it will do it fastly. If your queries are simple than definitly adopt it.

On the other hand, use SQL if you need multiple rows transaction. Want to perform complete CRUD.

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- Have Complex Queries

7) What are keys in DBMS ?

- Candidate key
- Alternate key
- Primary key
- Foreign key
- Super key
- Composite key

8) Brief the keys in DBMS ?

Candidate Key :

- The minimal set of attributes that can uniquely identify a tuple is known as candidate key.

⇒ Can have null values

Primary key :

- An attribute that can uniquely identify a tuple.

⇒ A unique key

⇒ It cannot be null.

Super key :

A set of attributes that can uniquely identify a tuple is known as super key.

Can have null values

A candidate key is a super key but not vice versa

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Alternate key:

The candidate key other than the primary key is called an alternate key

Foreign key:

- A set of attributes in a table that refers to the primary key of another table.

⇒ The table in which foreign key is present is called referencing table.

⇒ The table in which the primary key of respective foreign key is present is called referenced or target table.

Composite Key:

Multiple attributes used to identify a tuple uniquely are composite key.

9) Can a foreign key be null? How?

Yes, a foreign key can be null if there is no particular record of the primary key in target table in the referenced table.

10) What are joins?

Join clause is used to combine rows from two or more tables based on the

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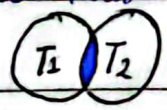
related column between them.

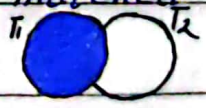
11) Can we update multiple tables using join in SQL?

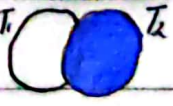
IN SQL, we can join multiple tables but we cannot update the data of multiple tables using a single update statement. We have to update separately.

12) Give the types of joins / Explain anyone join?

1) Inner Join: Returns records that have matching values in both tables 

2) Outer Join: Returns records that have matching or unmatching both values in both tables.

2.1) left (outer) Join: Returns all the records from the left table and the matched records from the right table 

2.2) Right (outer) Join: Returns all the records from the right table and the matched records from the left table 

2.3) Full (outer) Join: Returns all the records when there is a match in either left or right table 

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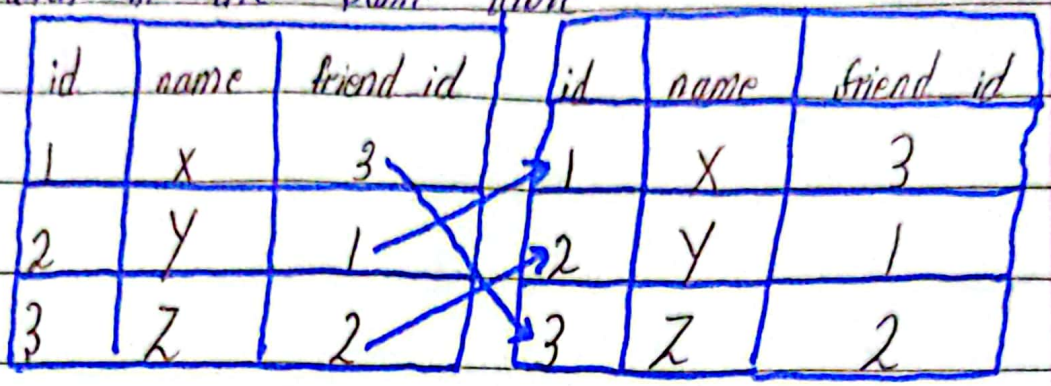
Self Join : Used to compare the records with in the same table



id	name	friend id
1	X	3
2	Y	1
3	Z	2

id	name	friend id
1	X	3
2	Y	1
3	Z	2

13) What is indexing in DBMS ?

A data structure technique.

It is used for quickly retrieving enteries from database files using some attributes that have been indexed.

14) what are the advantages of indexing?

Fast retrieval of data

Better performance of queries

Better searching of records

15) How indexing makes the retrieval faster ?

It stores a subset of columns and rows of a table in a sorted order. The index, acts like a pointer to the original table, allowing the database engine to find and retrieve the data faster than scanning the whole table.

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16) What are the disadvantages of indexing?

As indexing makes the subset of columns and rows of original table, it takes more disc space

Insert, update, delete are slowed by indexing, but update can be speed up if where clause contains the index field.

17) what is SQL injection?

It is a code injection technique that might destroy your database

Its one of the most common web hacking technique

It's the placement of malcious code in SQL statements, via web page input.

Based on 1=1 (Always true)

```
txtUserId = getRequestString("UserId")
"Select * from Users where UserId=" + txtUserId
```

if input = 105 OR 1=1

The query becomes

select * from Users where UserId =105 or 1=1

as; 1=1 is always true it will return all rows.

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18) What is normalization?

A database technique that reduces data redundancy and eliminates undesirable characteristics like insertion, updation and deletion.
Normalization rule divides the larger tables into smaller tables and link them using relationships.

19) What are the benefits of normalization?

1) Reduce data redundancy
2) Reduce data inconsistency.
3) Improves data integrity (Have relevant data)
4) Facilitates data updates
5) Simplifies database design

20) What are disadvantages of normalization?

1) Increased storage requirements
2) Queries become complex.
3) Queries become slow
4) Reduce flexibility.

21) When we need normalization? why → Anomalies → insert, deletion, updation

1- When the data is redundant
2- No data integrity 3- Partial dependency
4- Transitive dependancy

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21) What is first normalization?

=> 1 NF

A relation will be in INF if it has no repeating values rather has atomic value

ID	Name	Phone
1	X	031516 031819
2	Y	031621 033335

It has repeating values in phone column

1	X	031516
1	X	031819
2	Y	031621
2	Y	033335

22) what is Second normalization?

The relation should be in INF

There should be no partial dependency

Exlanguish سے Primary key کو سب attributes جو آگے ہو رہا ہے تو اسے علیحدہ کر دیں گے۔

ID	Subject	Age
25	chemistry	30
25	Biology	30
47	English	35
83	Math	38
83	Computer	38

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In the table we can see that id can directly link the age so we will make a separate table with these two attributes.

23) What is third Normalization.

The relation should be in 2NF

There should be no transitive property / dependency

Separate the non-prime attributes

BookID	GenreID	GenreType	Price
1	1	Gardening	10
2	2	Sports	20
3	1	Gardening	30
4	3	Travel	40
5	2	Sports	50

BookID	GenreID	Price
1	1	10
2	2	20
3	1	30
4	3	40
5	2	50

GenreID	Type
1	Gardening
2	Sports
3	Travel

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24) What are the types of SQL commands

DDL : Create, Alter, Drop, Truncate, Rename

DML : Select, Insert, Update, Delete

DCL : Grant, Revoke

TCL : Commit, Rollback, Saveprint

25) What is difference b/w drop, delete, Truncate.

Drop, Truncate are DDL commands.

Delete is DML command.

Drop is used to remove or drop complete table

Delete is used to delete particular record's rows

Truncate is used to remove a record.

26) what is transaction ?

A single logical unit of work which accesses and possibly modifies the contents of database.

Transaction is used to change / maintain the state of database i-e consistent or unconsistent

27) What is ACID in DBMS:

Atomicity : The entire transaction takes place at once or doesn't happen at all.

Consistency : The database must be consistent before and after the transaction.

ISolation : Multiple transaction occur independently without interference.

Durability : The changes of a successful transaction occurs even if the system failure occurs.

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28) How to find the N^{th} highest salary.

```
select Max(sal) from Employee
where sal IN
( select distinct sal from
Employee order by sal desc
Limit 4)
```