Trouble in File based system :

Redundency & Inconsistency
Integrity Problems(Defines Accurecy & Consistency of data stored in the DB)
Security.

1. What is Database ?
Ans: Database mane datar ghati, bascially jei khane data store thake, shei ta database.

2. What is DBMS ?
Ans: Database Management System hosse ekta program ba software,
etar kisu responsibility ache like database create kora , database maintain kora,
sathe sathe data manage kora. Data manage -> storing, processing, extracting.

3. What is RDBMS ?
Ans: Relational database management system. RDBMS data store korbe table e.
abong kisu relational operator provide kore table e rakha data gulo process korar jonno.
Example : SQL server.

4. What is SQL ? [not a programming language , command language]
Ans: Structured Query language. Eta use kora hoy Realational database e data insert korar jonno,
data retrieve korar jonno and update korar jonno.

DDL stands for Data Definition Language. SQL queries like CREATE, ALTER, DROP and RENAME come under this.
DML stands for Data Manipulation Language. SQL queries like INSERT, SELECT and UPDATE come under this.
DCL stands for Data Control Language. SQL queries like GRANT and REVOKE come under this.

4. What are Tables and Fields ?
Ans: Table is consist of Row and column. Field = Column.

5. What is Super Key ?
Ans: Super Key hosse set of attribute , jeta tabler ekta recored k uniquely identify korte pare.

6. What is Candidate Key ?
Ans: Minimal Super Key. Proper subset of super key.

7. What is Primary Key ?

Ans: [One of the Candidate key] Primary key hosse set of attribute , jeta ekta recored k uniquely identify korte pare.
eta NULL howa jabe na.

8. What is Unique key ?
Ans: simillar to primary key. But Value null hote parbe.

9. What is Foreign key ?
Ans: ekta tabler primary key jodi onno ekta table e use kora hoy tahole shei ta foreign key.
Dui ta tabler moddhe relationship create korar jnno foreign key use kora hoy.

10. What is Join ?
Ans: Join ekta keyword, muloto multiple table er data combine korar jonno Join bebohar kora hoy.
abong ekta common field er upor base kore join kora hoy.

Types Of Join :
Join/Inner join : condition match howa row gulo return korbe.
Left join : normal join + left e jei gulo match kore ni.
Right join : normal join + right e jei gulo match kore ni.
Full join : normal join + baki gulo

11. What is Normalization ?
Ans: Normalization is the process of minimizing data redundancy and dependency.
The main aim of Normalization is to add, delete or modify field that can be made in a single table.

First Normal Form (1NF): Column must include only atomic values.

| Person ID | Name | Email | Phone No |
01 s s@g 123,348,237

Explanation: ekta field multi-valued hole ki dhoroner problem hbe..?
amra jodi ekta phn er basis e query korte chai e.g SELECT Person Name FROM Person WHERE Person ID = 12434 AND Phone NO = "123".
Invalid Query : either you have to put full Phone No or Write a program that break the Phone No field which is time consuming and costly.

Solution:
Table 01. Person
| Person ID | Name | Email |
Table 02. Phone
| Phone ID | Phone No | Person ID |

Second Normal Form (2NF): No partial dependency of any of the columns on the primary key. [composite primary key exist]

Student ID	Batch ID	Name	Email	Start Date	Batch Size	Batch Time
01	01	s	s@gma	3-4-20	35	10:00
01	02	a	a@gma	3-4-20	35	11:00

Explanation: Name, Email are dependent on Student ID , at the same time start date, batch size, batch time are dependent on Batch ID.
Solution:
Table 01. Student
| Student ID | Name | Email |
Table 02. Batch
| Batch ID | Start Date | Batch Size | Batch Time |
Intermediate Table:
Table 03. Student-Batch
| Student Id | Batch ID |

Third Normal Form (3NF): Transitive dependent column remove korte hbe.

Teacher ID	Name	Dept	Dept Head
01	suvro	CSE	Fozle Rabbi

Explanation: Dept Head is not dependent on Teacher ID. Rather than it is dependent on Dept
Teacher <- dept [dept depends on teacher id]
dept <- dept head [dept head depends on dept]
Dept head transitivly dependent on teacher id

Solution:
Table 01. Teacher
| Teacher ID | Name | Dept |
Table 02. Dept
| Dept | Dept Head |

12. What is an index ?
Ans: Index hosse ekta data structure jei ta data retrival operation er speed improve kore.
Two Types : Clusterd and Non-Clustured

13. What is View ?
Ans: View holo virtual table, mainly data hide korar jonno virtual table create kora hoy.
amra user k jei data gulo provide korte chai ek/ekadhik table theke shei data gulo niye ekta virtual table banano.

14. What is Cursor ?
Ans: A database Cursor is a control which enables traversal over the rows or records in the table.

15. What is a relationship and what are they ?
Ans: Database Relationship is defined as the connection between the tables in a database. There are various data basing relationships, and they are as follows:.

a. One to One Relationship.
b. One to Many Relationship.
c. Many to One Relationship.
d. Self-Referencing Relationship.

16. What is Trigger ? / code
Ans: A Trigger is a code that associated with insert, update or delete operations.
The code is executed automatically whenever the associated query is executed on a table.

17. What is store-procedure ? / function
Ans: A stored procedure is like a function that contains a set of operations compiled together. It contains a set of operations that are commonly used in an application to do some common database tasks.

18. What is constraint ?
Ans: Constraint can be used to specify the limit on the data type of table.
NOT NULL.
CHECK.
DEFAULT.
UNIQUE.
PRIMARY KEY.
FOREIGN KEY.

19. What is Identity/AutoIncrement ?
Ans: Auto increment keyword allows the user to create a unique number to be generated when a new record is inserted into the table.
AUTO INCREMENT keyword can be used in Oracle and IDENTITY keyword can be used in SQL SERVER.

Mostly this keyword can be used whenever PRIMARY KEY is used.

20. What is Self-Join?
Ans: Self-join is set to be query used to compare to itself. This is used to compare values in a column with other values in the same column in the same table.

ALIAS ES can be used for the same table comparison.

21. What is Cross-Join ?
Ans: Cross join defines as Cartesian product where number of rows in the first table multiplied by number of rows in the second table.
If suppose, WHERE clause is used in cross join then the query will work like an INNER JOIN.

22. What is collation ?
Ans: Collation is defined as set of rules that determine how character data can be sorted and compared.
Following are different types of collation sensitivity-

- Case Sensitivity – A and a and B and b.
- Accent Sensitivity.
- Kana Sensitivity – Japanese Kana characters.
- Width Sensitivity – Single byte character and double byte character.

23. What is Trasaction and what are the ACID properties ?
Ans: A Database Transaction is a set of database operations that must be treated as whole, means either all operations are executed or none of them.
ACID (Atomicity, Consistency, Isolation, Durability) is a set of properties that guarantee that database transactions are processed reliably.

24.What is Union, minus and Interact commands?
Ans: UNION operator is used to combine the results of two tables, and it eliminates duplicate rows from the tables.
MINUS operator is used to return rows from the first query but not from the second query. Matching records of first
and second query and other rows from the first query will be displayed as a result set.
INTERSECT operator is used to return rows returned by both the queries.

25. What is the difference between TRUNCATE and DROP statements?
Ans: TRUNCATE removes all the rows from the table, and it cannot be rolled back.
DROP command removes a table from the database and operation cannot be rolled back.

26. What is the difference between TRUNCATE and DELETE commands?
Ans: TRUNCATE removes all the rows from the table, and it cannot be rolled back.
DELETE command is used to remove rows from the table, and WHERE clause can be used for conditional set of parameters.
Commit and Rollback can be performed after delete statement.

27. What are aggregate and scalar functions ?
Ans: Aggregate functions are used to evaluate mathematical calculation and return single values.

This can be calculated from the columns in a table. Scalar functions return a single value based on the input value.
Example -.
Aggregate – max(), count - Calculated with respect to numeric.
Scalar – UCASE(), NOW() – Calculated with respect to strings.

28. What is Functional Dependecny ?
Ans: it is a relationship [when one attribute uniquely determine another attribute].
x -> y [x determine the attribute y] x:determinant y:dependent