SQL questions

1. Difference between DBMS and RDBMS ?

   DBMS stores data as a file whereas in RDBMS, data is stored in the form of tables.
   DBMS supports single users, while RDBMS supports multiple users.
   DBMS does not support client-server architecture but RDBMS supports client-server architecture.
   DBMS has low software and hardware requirements whereas RDBMS has higher hardware and software requirements.
   In DBMS, data redundancy is common while in RDBMS, keys and indexes do not allow data redundancy.
2. What are constraints ?

   Constraints are nothing but restrictions or a set of rules implemented on tables to dictate what data can be inserted, updated or deleted in its tables
   Restricting particular type of data to be stored:-
   - Not Null:- not null declared to column in table restricts empty data to be inserted ,it can't store null or cant be empty
   - Unique:- Unique declared on column restricts the data cannot be repeated.
   - Primary Key:- primary key declared on column restricts that data cant be null and repeated . It is unique and not null and used for identification
   - **Foreign Key:-**

   This key helps us to build relation between two tables. A foreign key is a field (or collection of fields) in one table, that refers to the primary key in another table. A column or set of columns that allow us to establish a referential link between the data in two tables.
   - Enum:- it gives us a fixed value to be selected

   Like gender Enum('**F**','**M**'). Enum is like radio button either of only one must be selected
   - Set:- it can provide multiple data to be selected

   Like certificate Set('Java','Php','HTML') from this we can select all , one , two upto mark
3. What are joints?

Interview Questions

1. Subtract 2 tables?

   This means the record which is not present in the 2nd table
   Subtract table t1 from t2 based on primary key
   Select * from t1 where T1id NOT in(select unique T2id from T2);
   Example:-
   select * from employee where eid not in (select Distinct(eid) from incentives_list);

2. What do you mean by Crud operations

   Create ,Read, update, Delete doing these processes with database is called crud operations
3. What are joins in SQL?

   If we want to display content of 2 columns that belongs to different table then we need join operator. A `JOIN` clause is used to combine rows from two or more tables, based on a related column between them
   (INNER) JOIN: Returns records that have matching values in both tables

LEFT (OUTER) JOIN: Returns all records from the left table, and the matched records from the right table

RIGHT (OUTER) JOIN: Returns all records from the right table, and the matched records from the left table

FULL JOIN The *FULL OUTER JOIN* keyword returns all records when there is a match in left (table1) or right (table2) table records.

CARTESIAN JOIN:- The CARTESIAN JOIN or CROSS JOIN returns the Cartesian product of the sets of records from two or more joined tables.

Select * from employee,incentives_list;

SELF JOIN:- The SQL **SELF JOIN** is used to join a table to itself as if the table were two tables; temporarily renaming at least one table in the SQL statement.

```
SQL> SELECT  a.ID, b.NAME, a.SALARY
  FROM CUSTOMERS a, CUSTOMERS b
  WHERE a.SALARY < b.SALARY;
```

4. How to copy data from one table to another?

   The *INSERT INTO SELECT* statement copies data from one table and inserts it into another table.
   The *INSERT INTO SELECT* statement requires that the data types in source and target tables matches.
   Example:-
   INSERT INTO Customers (CustomerName, ContactName, Address, City, PostalCode, Country)
   SELECT SupplierName, ContactName, Address, City, PostalCode, Country FROM Suppliers;

5. If condition in sql ? or case ?

   The *CASE* statement goes through conditions and returns a value when the first condition is met (like an if-then-else statement). So, once a condition is true, it will stop reading and return the result. If no conditions are true, it returns the value in the *ELSE* clause.

```
CASE
   WHEN condition1 THEN result1
   WHEN condition2 THEN result2
   WHEN conditionN THEN resultN
   ELSE result
END;
```

   Example:-

```
SELECT OrderID, Quantity,
CASE WHEN Quantity > 30 THEN 'The quantity is greater than 30'
WHEN Quantity = 30 THEN 'The quantity is 30'
ELSE 'The quantity is under 30'
END AS QuantityText
FROM OrderDetails;
```

6. How can you reuse same query again and again in database?

   For this same like methods
   Create a procedure for the query which u think can be reusable in future in same code

```
Create procedure killy
As
Select * from employee
Go;
```

   Exec killy; this statement will run query select * from employee wherever called

This is called procedure.

7. How to add and delete column in table?

   Alter table employee add column salary int(9);
   Alter table employee drop column salary;

8. How get top 2 and last 2 records in sql?

   TOP:-

   In sql its select TOP 2 * from employee;

   For MYSQL:-

   Select * from employee limit 2;

   LAST:-

   Do the same but change the order

   Select * from employee order by eid limit 2;

9. Give all record from table whose city name starts with B?

   select * from employee where city like 'B%';

10. Give 3 letter of city?

    select mid(city,1,3) from employee;

11. Current system date in sql?

Select now();

12. Give name of employee whose DOB is 1999?

    SELECT EmpName
    FROM Employees
    WHERE birth_date BETWEEN '01/01/1999' AND '31/12/1999'

a. Give sql query to find the second highest salary of employee?

SELECT MAX(Salary) FROM Employee WHERE Salary NOT IN (select MAX(Salary) from Employee);

13. Give SQL Query to find Max Salary from each department.

SELECT DeptID, MAX(Salary) FROM Employee GROUP BY DeptID.

14. Write an SQL Query to print the name of the distinct employee whose DOB is between 01/01/1960 to 31/12/1975.

SELECT DISTINCT EmpName FROM Employees WHERE DOB BETWEEN '01/01/1960' AND '31/12/1975';

15. Write an SQL Query to find the number of employees according to gender whose DOB is between 01/01/1960 to 31/12/1975

SELECT COUNT(*), gender FROM Employees WHERE DOB BETWEEN '01/01/1960' AND '31/12/1975' GROUP BY gender ;

16. Write an SQL Query to find an employee whose salary is equal to or greater than 10000.

SELECT EmpName FROM Employees WHERE Salary>=10000;

17. How to fetch only year from date

SELECT YEAR(Now());
Its gives 2021

18. Intersect 2 tables?

Select * from employee INNER JOIN incentives_list ON employee.eid=incentives_list.eid;

19. Replace character in a column

SELECT REPLACE(ENAME,'A','E') from employee where eid=100;
Name was carl
It became cerl;

20. Normalization?

- Normalization is the process of organizing the data in the database.
- Normalization is used to minimize the redundancy from a relation or set of relations
- Normalization divides the larger table into the smaller table and links them using relationship.
- The normal form is used to reduce redundancy from the database table.

1NF:-
As per the rule of first normal form, an attribute (column) of a table cannot hold multiple values. It should hold only atomic values.

emp_id	emp_name	emp_address	emp_mobile
101	Herschel	New Delhi	8912312390
102	Jon	Kanpur	8812121212 9900012222

After 1 nf

emp_id	emp_name	emp_address	emp_mobile
101	Herschel	New Delhi	8912312390
102	Jon	Kanpur	8812121212
102	Jon	Kanpur	9900012222

Second normal form (2NF)

A table is said to be in 2NF if both the following conditions hold:

- Table is in 1NF (First normal form)
- No non-prime attribute is dependent on the proper subset of any candidate key of table.

An attribute that is not part of any candidate key is known as non-prime attribute.

teacher_id	subject	teacher_age
111	Maths	38
111	Physics	38
222	Biology	38
333	Physics	40
333	Chemistry	40

Divide it into 2 tables :-

teacher_id	teacher_age
111	38
222	38
333	40

teacher_id	subject
111	Maths
111	Physics
222	Biology
333	Physics
333	Chemistry

Third Normal form (3NF)

A table design is said to be in 3NF if both the following conditions hold:

- Table must be in 2NF
- Transitive functional dependency of non-prime attribute on any super key should be removed.

emp_id	emp_name	emp_zip	emp_state	emp_city	emp_district
1001	John	282005	UP	Agra	Dayal Bagh
1002	Ajeet	222008	TN	Chennai	M-City
1006	Lora	282007	TN	Chennai	Urrapakkam
1101	Lilly	292008	UK	Pauri	Bhagwan

1201	Steve	222999	MP	Gwalior	Ratan

After 3nf

emp_id	emp_name	emp_zip
1001	John	282005
1002	Ajeet	222008
1006	Lora	282007
1101	Lilly	292008
1201	Steve	222999

emp_zip	emp_state	emp_city	emp_district
282005	UP	Agra	Dayal Bagh
222008	TN	Chennai	M-City
282007	TN	Chennai	Urrapakkam
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