Q1. What is the difference between CHAR and VARCHAR data types in MYSQL?
Answer 1: CHAR is a fixed-length data type that always stores the same number of characters, while VARCHAR is a variable-length data type that can store a variable number of characters.

Q2. What is the difference between UNION and UNION ALL in MYSQL?

Answer 2: UNION combines the results of two or more SELECT statements into a single result set, removing any duplicate rows. UNION ALL, on the other hand, does not remove duplicate rows and returns all rows from all SELECT statements.

Q3. What is a subquery in MYSQL?
Answer 3: A subquery is a query that is nested inside another query. It is used to retrieve data from one or more tables based on a condition.

Q4. What is a self-join in MYSQL?
Answer 4: A self-join is a join in which a table is joined with itself. It is used to retrieve data from a table based on a relationship between two columns within the same table.
Q5. What is a foreign key in MYSQL?
Answer 5: A foreign key is a column or a set of columns in a table that refers to the primary key of another table. It is used to establish a relationship between two tables based on a common column.
Q6. What is the difference between INNER JOIN and OUTER JOIN in MYSQL?
Answer 6: INNER JOIN returns only the rows that have matching values in both tables being joined, while OUTER JOIN returns all rows from one table and the matching rows from the other table.

Q7. What is a view in MYSQL?
Answer 7: A view is a virtual table that is based on the result of a SELECT statement. It is used to simplify complex queries and make them easier to manage.
Q8. What is the difference between GROUP BY and HAVING clauses in MYSQL?
Answer 9: GROUP BY is used to group rows based on one or more columns, while HAVING is used to filter groups based on a condition.

Q9. What is the difference between an INDEX and a PRIMARY KEY in MYSQL? Answer 10: An INDEX is a data structure that is used to improve the performance of SELECT statements by allowing them to quickly locate rows based on the values in one or more columns. A PRIMARY KEY is a special type of index that uniquely identifies each row in a table.

Q10. What is a stored procedure in MYSQL?
Answer 11: A stored procedure is a set of SQL statements that are stored in the database and can be executed as a single unit. It is used to simplify complex database operations and improve performance.

Q11. What is a deadlock in MYSQL?
Answer 13: A deadlock occurs when two or more transactions are waiting for each other to release locks on resources that they need to access. This can cause the transactions to become stuck in an infinite loop, preventing them from completing.

Q12. What is a transaction in MYSQL?
Answer 14: A transaction is a sequence of one or more SQL statements that are executed as a single unit. Transactions are used to ensure data integrity and consistency in the database.

Q13. What is the difference between a LEFT JOIN and a RIGHT JOIN in MYSQL?
Answer 15: A LEFT JOIN returns all rows from the left table and the matching rows from the right table, while a RIGHT JOIN returns all rows from the right table and the matching rows from the left table.

Q14. What is the purpose of the ORDER BY clause in MYSQL?
Answer 16: The ORDER BY clause is used to sort the result set based on one or more columns. It can sort the result set in ascending or descending order.

Q15. What is the difference between a CHAR and TEXT data type in MYSQL?

Answer 17: CHAR is a fixed-length data type that always stores the same number of characters, while TEXT is a variable-length data type that can store a large amount of text data.

Q16. What is the purpose of the LIMIT clause in MYSQL?

Answer 18: The LIMIT clause is used to limit the number of rows returned by a SELECT statement. It is often used with an ORDER BY clause to sort the result set and then return only a subset of the rows.

Q17. What is a join condition in MYSQL?

Answer 19: A join condition is a condition that is used to join two or more tables together in a SELECT statement. It specifies the relationship between the columns in the tables that are being joined.

Q18. What is the purpose of the GROUP BY clause in MYSQL?

Answer 21: The GROUP BY clause is used to group rows based on one or more columns. It is typically used with aggregate functions, such as COUNT, SUM, AVG, etc. **Q19. What is the difference between a full outer join and a cross join in MYSQL?** Answer 22: A full outer join returns all rows from both tables being joined, while a cross join returns the Cartesian product of both tables. **Q20. What is the purpose of the WHERE clause in MYSQL?** Answer 23: The WHERE clause is used to filter rows based on a condition. It is typically used with a SELECT, UPDATE, or DELETE statement. **Q21. What is a natural join in MYSQL?** Answer 24: A natural join is a join in which two tables are joined based on all columns that have the same name and data type. It is a type of INNER JOIN. **Q22. What is the difference between a scalar function and an aggregate function in MYSQL?**

Answer 25: A scalar function returns a single value based on an input value, while an aggregate function returns a single value based on a group of input values.

Q23. What is the purpose of the DISTINCT keyword in MYSQL?

Answer 26: The DISTINCT keyword is used to remove duplicate rows from the result set of a SELECT statement.

Q24. What is a case statement in MYSQL?
Answer 27: A case statement is a conditional statement that is used to return different values based on different conditions.
Q25. What is the purpose of the LIKE operator in MYSQL?
Answer 28: The LIKE operator is used to search for a pattern in a string. It is often used with the % and _ wildcards to match any number of characters or a single character, respectively.

Q26. What is the purpose of the NOT NULL constraint in MYSQL?
Answer 29: The NOT NULL constraint is used to ensure that a column does not contain any NULL values. It is often used with the PRIMARY KEY and UNIQUE constraints to enforce data integrity.

Q27. Write a query to find the second-highest salary from the employee table.
Answer 30:

SELECT MAX(salary) FROM employee WHERE salary < (SELECT MAX(salary) FROM employee);

Q28. Write a query to find the department-wise count of employees in the employee table.
Answer 31:

SELECT department, COUNT(*) FROM employee GROUP BY department;

Q29. Write a query to find the names of employees who earn the highest salary in their respective departments.
Answer 32:

SELECT e.name, e.department, e.salary

FROM employee e WHERE e.salary = (

SELECT MAX(salary) FROM employee

WHERE department = e.department);

Q30. Write a query to find the names of departments that have more than 5 employees.
Answer 33:

SELECT department

FROM employee

GROUP BY department

HAVING COUNT(*) > 5;

Q31. Write a query to find the total number of orders for each customer in the orders table.
Answer 34:

SELECT customer_id, COUNT(*)

FROM orders

GROUP BY customer_id;

Q32. Write a query to find the total amount of sales for each month in the sales table.
Answer 35:

SELECT MONTH(date), SUM(amount)

FROM sales

GROUP BY MONTH(date);

Q33. Write a query to find the customers who have placed orders for all the products in the products table.
Answer 36:

SELECT o.customer_id, COUNT(DISTINCT o.product_id)

FROM orders o

GROUP BY o.customer_id

HAVING COUNT(DISTINCT o.product_id) = (SELECT COUNT(*) FROM products);

Q34. Write a query to find the products that have never been ordered.

Answer 37:

SELECT p.id, p.name

FROM products p

LEFT JOIN orders o ON p.id = o.product_id

WHERE o.product_id IS NULL;

Q35. Write a query to find the customers who have not placed any orders.

Answer 38:

SELECT c.id, c.name

FROM customers c

LEFT JOIN orders o ON c.id = o.customer_id

WHERE o.customer_id IS NULL;

Q36. Write a query to find the top 5 customers with the highest total sales in the orders table.

Answer 39:

SELECT c.name, SUM(o.amount)

FROM orders o

INNER JOIN customers c ON o.customer_id = c.id

GROUP BY o.customer_id

ORDER BY SUM(o.amount) DESC

LIMIT 5;

Q37. Write a query to find the number of employees who have been with the company for more than 10 years.

Answer 40:

SELECT COUNT(*)

FROM employee

WHERE DATEDIFF(CURDATE(), hire_date) > 3650;

Q38. Write a query to find the average salary of employees in each department.

Answer 41:

```
SELECT department, AVG(salary)

FROM employee

GROUP BY department;
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Q39. Write a query to find the products that have been ordered more than 100 times.

Answer 42:

```
SELECT p.name, COUNT(o.product_id)

FROM products p

INNER JOIN orders o ON p.id = o.product_id

GROUP BY o.product_id

HAVING COUNT(o.product_id) > 100;
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