

## SQL Interview Questions Answers

**1. Write a query to find the second highest salary from an employee table.**

**Answer:**

```
SELECT MAX(salary) AS second_highest_salary  
FROM employees  
WHERE salary < (SELECT MAX(salary) FROM employees);
```

**2. How would you retrieve the top 5 highest-paid employees from an employee table?**

**Answer:**

```
SELECT *  
FROM employees  
ORDER BY salary DESC  
LIMIT 5;
```

**3. Write a query to delete duplicate rows from a table based on a specific column.**

**Answer :**

```
DELETE FROM employees  
WHERE id NOT IN (  
    SELECT MIN(id)  
    FROM employees  
    GROUP BY column_name  
);
```

**4. Explain the difference between INNER JOIN, LEFT JOIN, RIGHT JOIN, and FULL OUTER JOIN.**

**Answer:**

**INNER JOIN:** Returns rows with matching values in both tables.

**LEFT JOIN:** Returns all rows from the left table, and matching rows from the right table. If no match, NULL is returned.

**RIGHT JOIN:** Similar to LEFT JOIN but returns all rows from the right table.

**FULL OUTER JOIN:** Combines the result of LEFT JOIN and RIGHT JOIN, including unmatched rows with NULLs.

**5. Write a query to calculate the average salary for each department.**

**Answer:**

```
SELECT department_id, AVG(salary) AS average_salary
FROM employees
GROUP BY department_id;
```

**6. How do you use the CASE statement in SQL, and provide an example?**

**Answer:**

The CASE statement is used for conditional logic.

```
SELECT employee_id,
       Salary,
       CASE
         WHEN salary > 50000 THEN 'High'
         WHEN salary BETWEEN 30000 AND 50000 THEN 'Medium'
         ELSE 'Low'
       END AS salary_category
```

FROM employees;

**7. Write a query to find employees who have not been assigned to any department.**

**Answer:**

```
SELECT *  
FROM employees  
WHERE department_id IS NULL;
```

**8. Explain the concept of a primary key and a foreign key in SQL.**

**Answer:**

**Primary Key:** A unique identifier for each row in a table. Ensures no duplicate or NULL values.

**Foreign Key:** Establishes a relationship between two tables by referencing the primary key of another table.

**9. Write a query to add a new column to an existing table.**

**Answer:**

```
ALTER TABLE employees  
ADD COLUMN age INT;
```

**10. How can you handle NULL values in SQL when performing calculations?**

**Answer:** Use functions like COALESCE() or ISNULL() to replace NULL with a default value.

```
SELECT name, salary + COALESCE(bonus, 0) AS total_salary  
FROM employees;
```

**11. Explain the difference between WHERE and HAVING clauses in SQL.**

**Answer: WHERE:** Filters rows before aggregation.

**HAVING:** Filters groups after aggregation.

Example:

```
SELECT department_id, AVG(salary)
```

```
FROM employees
```

```
WHERE department_id IS NOT NULL
```

```
GROUP BY department_id
```

```
HAVING AVG(salary) > 50000;
```