Joins and Subqueries

Concept-Based Questions

Q1. What is a JOIN in SQL?
A1. A JOIN is used to combine rows from two or more tables based on a related column.

Q2. List different types of JOINs in SQL.
A2. INNER JOIN, LEFT JOIN, RIGHT JOIN, FULL OUTER JOIN, CROSS JOIN, SELF JOIN.

Q3. What is the difference between INNER JOIN and LEFT JOIN?
A3. INNER JOIN returns only matching rows; LEFT JOIN returns all rows from the left table and matching rows from the right.

Q4. What is a subquery?
A4. A query nested inside another SQL query.

Q5. Where can subqueries be used?
A5. In SELECT, FROM, and WHERE clauses.

Code-Based Questions

Q6. Display employee names with their department names.

```
SELECT e.first_name, d.department_name
FROM employees e
JOIN departments d ON e.department_id = d.department_id;
```

Q7. List all departments and the names of employees (if any).

```
SELECT d.department_name, e.first_name
FROM departments d
LEFT JOIN employees e ON d.department_id = e.department_id;
```

Q8. Find employees who work in the same department as 'John'.

```
SELECT * FROM employees
WHERE department_id = (
  SELECT department_id FROM employees WHERE first_name = 'John'
);
```

Q9. Retrieve employee names who have the highest salary.

```
SELECT first_name FROM employees
WHERE salary = (SELECT MAX(salary) FROM employees);
```

Q10. Show employee names and their managers' names.

```sql
SELECT e.first_name AS Employee, m.first_name AS Manager
FROM employees e
LEFT JOIN employees m ON e.manager_id = m.employee_id;
```

Scenario-Based

Q11. List employees who do not belong to any department.

```sql
SELECT first_name FROM employees
WHERE department_id IS NULL;
```