Unlock the World of SQL: Dive into Comprehensive Questions and Answers

***Understanding the Database Schema and Relationships:**

Department (dept_no, dept_name, location)
Employee (emp_no, emp_name, address, salary, designation)

Relation between Department and Employee is One to Many.
Constraint: Primary key, salary should be > 0.

***Database Initialization: Creating Tables and Inserting Initial Values:**

```
 CREATE TABLE department
    (
    dno number(5) primary key,
    dname varchar(20) not null,
    dloc varchar(20)
    );

CREATE TABLE employee (
  eno number(5) primary key,
  ename varchar(20) not null,
  eadd varchar(20),
  esal number(5) check(esal > 0),
  desig varchar(10),
  dno number(5),
  FOREIGN KEY (dno) REFERENCES department(dno)
);

INSERT ALL
  INTO department (dno, dname, dloc) VALUES (1, 'HR', 'New York')
  INTO department (dno, dname, dloc) VALUES (2, 'IT', 'San Francisco')
  INTO department (dno, dname, dloc) VALUES (3, 'Finance', 'Chicago')
  INTO department (dno, dname, dloc) VALUES (4, 'Marketing', 'Los Angeles')
  INTO department (dno, dname, dloc) VALUES (5, 'Operations', 'Houston')
SELECT * FROM dual;

INSERT ALL
  INTO employee (eno, ename, eadd, esal, desig, dno) VALUES (101, 'John Smith', '123 Main St', 60000, 'Manager', 1)
  INTO employee (eno, ename, eadd, esal, desig, dno) VALUES (102, 'Jane Doe', '456 Oak St', 50000, 'Analyst', 1)
  INTO employee (eno, ename, eadd, esal, desig, dno) VALUES (103, 'Bob Johnson', '789 Pine St', 70000, 'Developer', 2)
  INTO employee (eno, ename, eadd, esal, desig, dno) VALUES (104, 'Alice Williams', '101 Maple St', 55000, 'Tester', 2)
  INTO employee (eno, ename, eadd, esal, desig, dno) VALUES (105, 'Eva Davis', '202 Elm St', 80000, 'Manager', 3)
  INTO employee (eno, ename, eadd, esal, desig, dno) VALUES (106, 'Charlie Brown', '303 Cedar St', 60000, 'Analyst', 3)
  INTO employee (eno, ename, eadd, esal, desig, dno) VALUES (107, 'Grace Taylor', '404 Birch St', 75000, 'Developer', 4)
  INTO employee (eno, ename, eadd, esal, desig, dno) VALUES (108, 'David Lee', '505 Walnut St', 45000, 'Tester', 4)
  INTO employee (eno, ename, eadd, esal, desig, dno) VALUES (109, 'Sophie Wilson', '606 Pine St', 90000, 'Manager', 5)
  INTO employee (eno, ename, eadd, esal, desig, dno) VALUES (110, 'Michael Miller', '707 Oak St', 65000, 'Analyst', 5)
SELECT * FROM dual;
```

***Viewing Database Records: Selecting and Displaying Data:**

SQL> SELECT * FROM department;

DNO	DNAME	DLOC
1	HR	New York
2	IT	San Francisco
3	Finance	Chicago
4	Marketing	Los Angeles
5	Operations	Houston

SQL> SELECT * FROM employee;

ENO	ENAME	EADD	ESAL	DESIG	DNO
101	John Smith	123 Main St	60000	Manager	1
102	Jane Doe	456 Oak St	50000	Analyst	1
103	Bob Johnson	789 Pine St	70000	Developer	2
104	Alice Williams	101 Maple St	55000	Tester	2
105	Eva Davis	202 Elm St	80000	Manager	3
106	Charlie Brown	303 Cedar St	60000	Analyst	3
107	Grace Taylor	404 Birch St	75000	Developer	4
108	David Lee	505 Walnut St	45000	Tester	4
109	Sophie Wilson	606 Pine St	90000	Manager	5
110	Michael Miller	707 Oak St	65000	Analyst	5

***SQL Query Challenges: Unraveling Data Insights with Real-world Questions:**

Q1.Find total salary of all IT department employees.

SQL> SELECT SUM(esal) AS TotalSalary from department,employee WHERE dname='IT' AND department.dno=employee.dno;

TOTALSALARY
125000

Q2.Find the name of department whose salary is above 70000.

SQL> SELECT dname AS DepartmentName FROM department,employee WHERE esal>70000 AND department.dno=employee.dno;

DEPARTMENTNAME
Finance
Marketing
Operations

Q3.Count the number of employees in each department.

SQL> SELECT Count(eno) AS EmpCount FROM department,employee WHERE department.dno=employee.dno GROUP BY dname;

EMPCOUNT
2
2
2
2
2

Q4.Display the maximum salary of each department.

SQL> SELECT dname AS DepartmentName,MAX(esal) FROM department,employee WHERE department.dno=employee.dno GROUP BY dname;

DEPARTMENTNAME	MAX(ESAL)
IT	70000
HR	60000
Finance	80000
Marketing	75000
Operations	90000

Q5.Display department wise employee list.

SQL> SELECT dname AS DepartmentName,ename AS EmployeeName FROM department,employee WHERE department.dno=employee.dno;

DEPARTMENTNAME	EMPLOYEENAME
HR	John Smith
HR	Jane Doe
IT	Bob Johnson
IT	Alice Williams
Finance	Eva Davis
Finance	Charlie Brown
Marketing	Grace Taylor
Marketing	David Lee
Operations	Sophie Wilson

Operations	Michael Miller