SQL & DATABASES

1. What is the basic syntax of a SELECT statement?

2. How do you apply multiple conditions in a WHERE clause? (AND, OR, NOT)

3. How do you use the BETWEEN operator?

4. What is the difference between IN operator and OR operator?

5. How do you use the LIKE operator for pattern matching?

6. How do wildcards (%, _) work with the LIKE operator?

7. When do you use IS NULL and IS NOT NULL?

8. What is the use of the DISTINCT keyword?

9. How do you use the LIMIT/TOP clause?

10. How do you create column aliases?

11. What is the use of the COUNT() function?

12. What is the difference between SUM() and AVG()?

13. Explain MIN() and MAX() functions.

14. What is the difference between COUNT(*) and COUNT(column_name)?

15. What is the use of COUNT(DISTINCT column_name)?

16. How do aggregate functions handle NULL values?

17. What is the use of the ROUND() function?

18. Explain FLOOR() and CEIL() functions.

19. What is the use of the ABS() function?

20. How do you use the CONCAT() function for string concatenation?

21. How do you use the ORDER BY clause?

22. What is the difference between ASC and DESC sorting?

23. How do you sort by multiple columns?

24. Where do NULL values appear in sorting (first/last)?

25. What is the use of the CASE statement?

26. What is the use of the GROUP BY clause?

27. How do you use GROUP BY and WHERE clause together?

28. What is the HAVING clause? How is it different from WHERE?

29. How do you GROUP BY multiple columns?

30. Give an example of GROUP BY with aggregate functions.

31. How do you apply multiple conditions in the HAVING clause?

32. How do you sort after GROUP BY?

33. Give a practical example of COUNT() with GROUP BY.

34. How are NULL values handled in GROUP BY?

35. Is GROUP BY valid without an aggregate function?

36. What is a JOIN? How many types are there?

37. How does INNER JOIN work? Give an example.

38. Explain LEFT JOIN (LEFT OUTER JOIN) with an example.

39. What is RIGHT JOIN (RIGHT OUTER JOIN)?

40. What is FULL OUTER JOIN?

41. What is CROSS JOIN? When is it used?

42. What is SELF JOIN? Give a use case.

43. How do you JOIN multiple tables?

44. How do you use multiple columns in a JOIN condition?

45. What is the difference between ON clause and USING clause?

46. What is the difference between INNER JOIN and WHERE clause filtering?

47. When do NULL values appear in LEFT JOIN?

48. Give an example of joining three tables.

49. What is the difference between JOIN and UNION?

50. What is the difference between implicit JOIN and explicit JOIN?

51. What is the UNION operator?

52. What is the difference between UNION and UNION ALL?

53. What is the use of the INTERSECT operator?

54. Explain the EXCEPT/MINUS operator.

55. Why is it necessary to match columns for UNION?

56. What is a subquery? Give an example.

57. What is the difference between correlated subquery and non-correlated subquery?

58. How do you use a subquery in the WHERE clause?

59. Give an example of a subquery in the FROM clause (derived table).

60. How do you use a subquery in the SELECT clause?

61. What is the use of the EXISTS operator?

62. IN vs EXISTS - which is better and why?

63. Give a use case for NOT EXISTS.

64. How do you use an aggregate function in a subquery?

65. What is a multiple row subquery?

66. What is a window function? How is it different from an aggregate function?

67. What is the use of the ROW_NUMBER() function?

68. What is the difference between RANK() and DENSE_RANK()?

69. Explain the NTILE() function.

70. What is the use of the PARTITION BY clause?

71. What is the OVER() clause?

72. What is the use of LEAD() and LAG() functions?

73. Explain FIRST_VALUE() and LAST_VALUE().

74. How do you calculate a running total (cumulative sum)?

75. Write a query to calculate a moving average.

76. What is a window frame (ROWS vs RANGE)?

77. Explain the practical difference between ROW_NUMBER() and RANK() with an example.

78. How do you extract Top N records per group using window functions?

79. What is the main difference between PARTITION BY and GROUP BY?

80. When is ORDER BY mandatory in window functions?

81. What is the syntax of the INSERT statement?

82. How do you INSERT multiple rows at once?

83. What is the use of the INSERT INTO SELECT statement?

84. How does the UPDATE statement work?

85. What is the risk of not using a WHERE clause in UPDATE?

86. How do you UPDATE multiple columns together?

87. What is the use of the DELETE statement?

88. What is the difference between DELETE and TRUNCATE?

89. What is the difference between DROP and TRUNCATE?

90. How do you use a subquery in an UPDATE statement?

91. How do you implement UPSERT (INSERT or UPDATE)?

92. How do you perform conditional UPDATE (with CASE statement)?

93. What is a Primary Key? What are its properties?

94. What is a Foreign Key? What is its use?

95. What is the difference between UNIQUE constraint and Primary Key?

96. What is the use of NOT NULL constraint?

97. What is CHECK constraint?

98. Explain DEFAULT constraint.

99. What is a composite key?

100. Define candidate key, super key, and alternate key.