

Database Exam

1. What does ERD stand for?

- A) Entity Relation Diagram
- B) Entity Relationship Diagram
- ☒ C) Entity Relational Data
- D) Entity Relation Design

2. Which of the following represents a primary key in ERD?

- A) Rectangle
- B) Ellipse
- ☒ C) Underlined Attribute
- D) Diamond

3. In database normalization, what is the main goal?

- A) To duplicate data
- ☒ B) To remove redundancy
- C) To increase data size
- D) To reduce data retrieval speed

4. Which normalization form eliminates partial dependency?

- A) 1NF
- B) 2NF
- C) 3NF
- ☒ D) BCNF

5. Which phase of database design involves defining tables, indexes, and storage parameters?

- ☒ A) Logical Schema
- ☒ B) Mapping Rules
- C) Physical Schema
- D) ERD

6. Which phase of database design involves converting ERD to tables?

- A) Conceptual Design
- ☒ B) Logical Design
- ☐ C) Physical Design
- D) Data Modeling

7. What is the rule to convert a weak entity in ERD to a table?

- A) It should have its own primary key.
- ☒ B) It should inherit the primary key from the strong entity.
- ☐ C) It should merge with the strong entity.
- D) It should create an intersection table.

8. Which of the following refers to a logical schema?

- A) Hardware-level data storage
- B) Conceptual data model
- ☒ C) Database metadata definition
- D) User interface definition

9. Which normal form ensures that there is no transitive dependency?

- A) 1NF
- B) 2NF
- ☒ C) 3NF
- D) 4NF

10. What is the relationship between mapping rules and physical schema?

- A) Mapping rules define physical storage
- B) Mapping rules are for normal forms only
- ☒ C) Mapping rules convert logical schema to physical schema
- D) Mapping rules describe entity constraints

11. During which phase of database design are storage requirements evaluated?

- A) Logical Design
- ☒ B) Physical Design
- C) Conceptual Design
- ☐ D) Mapping Rules

12. Which command is used to create a new table in SQL?

- A) INSERT
- B) SELECT
- ☒ C) CREATE
- D) UPDATE

13. Which command is used to modify data in a table?

- ☒ A) DELETE
- B) ALTER
- ☒ C) UPDATE
- D) TRUNCATE

14. DCL commands are mainly used for:

- A) Transaction control
- B) Data retrieval
- ☒ C) Data security
- D) Table modification

15. Which of the following is a DML command?

- A) GRANT
- B) SELECT
- ☒ C) INSERT
- D) ROLLBACK

16. What is the purpose of the COMMIT command in SQL?

- A) Rollback transactions
- B) View data
- ☒ C) Save changes
- D) Define data structures

17. Which of the following commands is used to ensure data consistency?

- ☒ A) GRANT
- B) SELECT
- ☒ C) COMMIT
- D) CREATE

18. Which command in SQL is used to change the structure of an existing table?

- A) UPDATE
- ~~B) ALTER~~
- C) CREATE
- D) MERGE

19. What does DQL stand for in SQL?

- ~~A) Data Query Language~~
- B) Database Query Language
- C) Data Quality Language
- D) Direct Query Language

20. Which TCL command is used to undo a transaction in SQL?

- ~~A) SAVEPOINT~~
- B) COMMIT
- ~~C) ROLLBACK~~
- D) GRANT

21. Which of the following is NOT a DML command?

- ~~A) SELECT~~
- B) DELETE
- C) UPDATE
- ~~D) REVOKE~~

22. What is the main role of the ROLLBACK command?

- A) To save a transaction
- ~~B) To undo uncommitted transactions~~
- C) To view data
- D) To create a backup

23. Which of the following is used to grant permissions to users in SQL?

- A) SELECT
- B) ALTER
- ~~C) GRANT~~
- D) COMMIT

24. In which division is the Union statement categorized in SQL?

- A) DDL
- ☒ B) DML
- C) TCL
- D) DCL

25. Which command ensures that a user's changes are permanently recorded in a database?

- A) ROLLBACK
- ☒ B) COMMIT
- C) GRANT
- ☒ D) DELETE

26. Which of the following is NOT a feature of the ALTER command in SQL?

- ☒ A) Change data type of columns
- B) Add new columns
- ☒ C) Rename tables
- D) Insert data

27. What does an INNER JOIN do?

- A) Combines all rows from two tables
- ☒ B) Combines rows with matching values in both tables
- C) Combines rows with no matching values
- D) Combines only null values

28. Which type of join returns all rows from both tables, matching rows where possible?

- A) INNER JOIN
- B) LEFT JOIN
- ☒ C) FULL OUTER JOIN
- D) CROSS JOIN

29. What kind of join is used to return all records from the left table and matched records from the right table?

- A) INNER JOIN
- ☒ B) RIGHT JOIN
- C) LEFT JOIN
- D) CROSS JOIN

30. In a RIGHT JOIN, which table's unmatched rows are also returned?

- A) Left Table
- ☒ B) Right Table
- C) Both Tables
- ☒ D) Neither Table

31. What does a CROSS JOIN produce?

- ☒ A) Cartesian product of two tables
- B) Matched rows only
- C) Unmatched rows only
- D) NULL values

32. Which join is suitable for finding unmatched records in two tables?

- A) INNER JOIN
- ☒ B) OUTER JOIN
- ☒ C) SELF JOIN
- D) CROSS JOIN

33. What is the result of a SELF JOIN?

- A) Combination of rows from two different tables
- ☒ B) Combination of rows from the same table
- C) Null values only
- D) Duplicate rows only

34. Which join can be used to match rows from Table A that have no corresponding rows in Table B?

- A) LEFT JOIN
- B) INNER JOIN
- C) RIGHT JOIN
- ☒ D) CROSS JOIN

35. Which of the following join types produces duplicate rows if a column has duplicate values?

- A) FULL JOIN
- B) CROSS JOIN
- ☒ C) LEFT JOIN
- D) INNER JOIN

36. In SQL, which join would you use to combine a table with itself?

- ☒ A) SELF JOIN
- B) OUTER JOIN
- C) CROSS JOIN
- D) FULL JOIN

37. When using a FULL OUTER JOIN, what happens when no matching rows exist between the tables?

- A) Only matching rows are returned
- ☒ B) NULL values are used to fill the gaps
- C) No rows are returned
- D) Only unmatched rows are returned

38. Which of the following conditions is used to join two tables based on column values?

- A) USING
- ☒ B) JOIN ON
- C) JOIN WITH
- D) JOIN WHERE

39. Which join is most commonly used to fetch records that exist in both tables?

- A) LEFT JOIN
- B) RIGHT JOIN
- ☒ C) INNER JOIN
- D) CROSS JOIN

40. Which of the following is an aggregation function in SQL?

- A) JOIN()
- ☒ B) SUM()
- C) IF()
- D) CASE()

41. Which function calculates the average value of a column?

- ☒ A) AVG()
- B) SUM()
- C) COUNT()
- D) MIN()

42. What is the role of the COUNT() function?

- A) Count only distinct rows
- B) Count only numeric values
- ☒ C) Count all rows, including nulls
- D) Count only rows with NULL values

43. Which of the following statements is TRUE about the AVG() function?

- A) It ignores NULL values.
- B) It counts NULL values.
- C) It replaces NULL values with zero.
- ☒ D) It calculates the sum of all values.

44. How can you find the sum of distinct values in a column using SQL?

- ☒ A) SUM(DISTINCT column_name)
- B) DISTINCT SUM(column_name)
- C) UNIQUE SUM(column_name)
- D) SUM(UNIQUE column_name)

45. Which SQL clause is typically used with aggregate functions?

- A) WHERE
- B) HAVING
- ☒ C) ORDER BY
- D) JOIN

46. What does COUNT(1) return in SQL?

- A) Count of NULL rows
- ☒ B) Count of all rows, including NULLs
- C) Count of rows with 1s
- D) Count of distinct rows

47. Which of the following is used to group rows with similar values?

- A) ORDER BY
- ☒ B) GROUP BY
- C) DISTINCT
- D) LIMIT

48. Which aggregate function allows for the use of window functions in SQL?

- A) AVG()
- ☒ B) ROW_NUMBER()
- C) COUNT()
- D) RANK()

49. How does the HAVING clause differ from the WHERE clause in SQL?

- A) HAVING filters rows before grouping.
- ☒ B) HAVING filters rows after grouping.
- C) WHERE filters rows after aggregation.
- D) WHERE filters grouped rows only.

50. What will COUNT(DISTINCT column_name) return in SQL?

- A) Total count of rows
- B) Count of non-null rows
- ☒ C) Count of distinct values
- D) Count of all null values

51. Which of the following statements is used to get the number of different values in a column?

- ☒ A) COUNT(column_name)
- B) COUNT(DISTINCT column_name)
- C) SUM(column_name)
- D) AVG(column_name)

52. What is the first step in SQL execution order?

- ☒ A) SELECT
- B) FROM
- C) WHERE
- D) GROUP BY

53. In which order is the SELECT statement executed in SQL?

- ☒ A) SELECT → FROM → WHERE
- B) FROM → WHERE → SELECT
- C) WHERE → FROM → SELECT
- D) SELECT → WHERE → FROM

54. What does the WHERE clause filter in SQL?

- ☒ A) Columns
- ☐ B) Rows
- ☐ C) Tables
- ☐ D) Joins

55. Which clause is used to sort the result set in SQL?

- ☐ A) GROUP BY
- ☐ B) HAVING
- ☒ C) ORDER BY
- ☐ D) LIMIT

56. Which clause is used to filter aggregated results in SQL?

- ☒ A) WHERE
- ☒ B) HAVING
- ☒ ~~C) GROUP BY~~
- ☐ D) ORDER BY

57. Which of the following clauses is executed last in an SQL query?

- ☐ A) FROM
- ☐ B) SELECT
- ☐ C) WHERE
- ☒ D) ORDER BY

58. In SQL, which step of execution evaluates the JOIN condition?

- ☒ A) WHERE
- ☐ B) FROM
- ☐ C) SELECT
- ☒ D) HAVING

59. Which clause is used before aggregation in SQL?

- ☐ A) WHERE
- ☐ B) HAVING
- ☐ C) ORDER BY
- ☒ D) SELECT

60. What is the correct order of execution for the following clauses: SELECT, GROUP BY, HAVING?

- ☒ A) SELECT → GROUP BY → HAVING
- ☐ B) GROUP BY → HAVING → SELECT
- ☐ C) FROM → GROUP BY → HAVING → SELECT
- ☐ D) FROM → SELECT → GROUP BY → HAVING

61. Which clause is responsible for grouping data in SQL?

- ☒ A) GROUP BY
- ☐ B) HAVING
- ☐ C) ORDER BY
- ☐ D) WHERE

62. Which of the following clauses filters aggregated data?

- ☐ A) WHERE
- ☒ B) HAVING
- ☐ C) GROUP BY
- ☐ D) ORDER BY

63. Which clause is responsible for filtering rows before aggregation?

- ☐ A) HAVING
- ☒ B) WHERE
- ☐ C) GROUP BY
- ☐ D) SELECT

64. What is the correct order of the SQL execution plan?

- ☐ A) FROM → WHERE → GROUP BY → HAVING → SELECT → ORDER BY
- ☐ B) WHERE → FROM → SELECT → GROUP BY → ORDER BY → HAVING
- ☐ C) SELECT → WHERE → FROM → GROUP BY → HAVING → ORDER BY
- ☒ D) GROUP BY → HAVING → FROM → WHERE → SELECT → ORDER BY

65. In which part of SQL execution is the join condition applied?

- ☒ A) WHERE clause
- ☒ B) FROM clause
- ☐ C) SELECT clause
- ☐ D) HAVING clause

66. What does the RANK() function do in SQL?

- A) Returns the sum of rows
- ☒ B) Assigns a rank to each row
- C) Counts NULL values
- ☒ D) Groups similar values

67. Which rank function assigns a rank to rows without gaps in the ranking sequence?

- ☒ A) DENSE_RANK()
- B) RANK()
- ☒ C) ROW_NUMBER()
- D) NTILE()

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

- ☒ A) RANK() has gaps; DENSE_RANK() does not
- B) RANK() has no gaps; DENSE_RANK() has gaps
- C) Both have gaps in rank assignment
- D) Neither has gaps in rank assignment

69. Which of the following rank functions can be used to divide rows into equal parts?

- A) RANK()
- ☒ B) NTILE()
- C) ROW_NUMBER()
- D) DENSE_RANK()

70. Which rank function assigns a unique rank to each row in the result set?

- A) ROW_NUMBER()
- ☒ B) DENSE_RANK()
- C) RANK()
- D) NTILE()

71. How does NTILE() distribute rows?

- A) Divides rows into a specified number of equal parts
- B) Assigns ranks to rows
- C) Assigns row numbers
- ☒ D) Groups similar rows

72. What is the difference between ROW_NUMBER() and RANK()?

- A) ROW_NUMBER() assigns unique numbers, RANK() may assign duplicate ranks
- ☒ B) RANK() assigns unique numbers, ROW_NUMBER() assigns duplicate numbers
- C) Both assign unique numbers
- D) Both assign duplicate ranks

73. Which rank function is ideal for assigning sequential integers starting from 1?

- ☒ A) DENSE_RANK()
- B) RANK()
- ☒ C) ROW_NUMBER()
- D) NTILE()

74. In which clause is the RANK() function used?

- A) GROUP BY
- ☒ B) ORDER BY
- C) HAVING
- ☒ D) SELECT

75. What happens when there are duplicates in the column on which RANK() is based?

- A) Gaps are created in the ranking sequence
- ☒ B) Ranks are always sequential
- C) All ranks are the same
- D) No ranks are assigned

76. Which of the following statements is used to rank rows based on a specific column?

- ☒ A) SELECT column_name, RANK() OVER(ORDER BY column_name)
- B) SELECT RANK(column_name)
- C) SELECT column_name, RANK(column_name)
- D) SELECT RANK OVER(column_name)

77. How is DENSE_RANK() different from ROW_NUMBER() in terms of handling duplicates?

- A) DENSE_RANK() skips numbers; ROW_NUMBER() does not
- ☒ B) ROW_NUMBER() skips numbers; DENSE_RANK() does not
- C) Both skip numbers
- D) Neither skips numbers

78. How is the ranking sequence affected when using ROW_NUMBER()?

- ☒ A) It skips ranks for duplicates
- ☐ B) It is sequential without skipping
- ☐ C) It assigns the same rank to duplicates
- ☐ D) It ignores duplicates

79. What is a view in SQL?

- ☐ A) A temporary table
- ☒ B) A virtual table
- ☐ C) A permanent table
- ☐ D) An index

80. What is the purpose of a function in SQL?

- ☐ A) Create new tables
- ☒ B) Perform specific operations and return results
- ☐ C) Delete rows
- ☐ D) Update records

81. Can a view be updated in SQL?

- ☐ A) Yes, always
- ☐ B) Yes, but with limitations
- ☒ C) No, never
- ☐ D) Only during transactions

82. What type of function is used to perform calculations and return a single value?

- ☒ A) Scalar function
- ☐ B) Table-valued function
- ☐ C) Aggregate function
- ☐ D) Window function

83. Which of the following is a benefit of using views in SQL?

- ☒ A) Data security
- ☐ B) Data duplication
- ☐ C) Performance degradation
- ☐ D) Increase in storage

84. What is the difference between a table-valued function and a scalar function?

- ☒ A) Table-valued returns rows; scalar returns a single value
- ☐ B) Scalar returns rows; table-valued returns a single value
- ☐ C) Both return single values
- ☐ D) Both return rows

85. Which of the following is a characteristic of a stored function in SQL?

- ☐ A) It can be used in SELECT statements
- ☐ B) It cannot return any value
- ☒ C) It is used to update tables only
- ☐ D) It runs only once

86. Which SQL statement would you use to execute a stored function?

- ☐ - A) SELECT function_name(arguments)
- ☒ - B) EXECUTE function_name(arguments)
- ☐ - C) INSERT function_name(arguments)
- ☐ - D) DELETE function_name(arguments)

87. What is a stored procedure in SQL?

- ☒ A) A predefined query that performs a specific task
- ☐ B) A temporary table
- ☐ C) An external script
- ☐ D) A data backup method

88. What is the primary purpose of a trigger in SQL?

- ☐ A) To store data permanently
- ☒ B) To automatically execute a response to a specific event
- ☐ C) To back up databases
- ☐ D) To generate reports

89. Which of the following can be controlled using triggers in a database?

- ☐ A) User roles
- ☐ B) Database optimization
- ☒ C) Data consistency and integrity
- ☐ D) Index creation

90. What is the main difference between a stored procedure and a trigger?

- A) Stored procedures are event-driven, triggers are not.
- ☒ B) Triggers are event-driven, stored procedures are not.
- C) Both are event-driven.
- D) Both are not event-driven.

91. Which clause is used to declare variables in stored procedures?

- ☒ A) DECLARE
- B) SET
- C) BEGIN
- D) INITIATE

92. How can a stored procedure be executed?

- ☒ A) EXECUTE
- B) RUN
- C) SELECT
- D) CALL PROCEDURE

93. What is the purpose of using parameters in stored procedures?

- A) To create views
- ☒ B) To pass values for specific tasks
- C) To back up data
- D) To generate indexes

94. Which of the following allows for the execution of multiple SQL statements in a single stored procedure?

- ☒ A) BEGIN-END block
- ☒ B) IF-ELSE block
- C) DECLARE block
- D) SELECT block

95. Which trigger type is fired after both INSERT and UPDATE operations?

- A) AFTER INSERT
- B) AFTER UPDATE
- ☒ C) AFTER INSERT OR UPDATE
- D) BEFORE INSERT

96. What is a major benefit of using triggers for auditing purposes?

- A) Easy deletion of records
- B) Automatic tracking of changes
- C) Data compression
- D) Better storage management

97. What can be used within a stored procedure to control the flow of execution?

- A) IF-ELSE statements
- B) VIEWS
- C) AGGREGATION functions
- D) INDEXES

98. What is a cursor in SQL?

- A) A pointer to fetch rows one-by-one
- B) A data type for tables
- C) A column in a table
- D) A row identifier

99. Which command is used to declare a variable in SQL?

- A) CREATE VARIABLE
- B) DECLARE
- C) SET VARIABLE
- D) ASSIGN

100. What is the main purpose of using a cursor?

- A) To store data
- B) To fetch and process rows individually
- C) To create tables
- D) To create indexes

101. Which of the following is a step in using a cursor?

- A) OPEN
- B) INSERT
- C) CREATE
- D) SELECT

102. What does the CLOSE statement do for a cursor?

- A) Declares a cursor
- ☒ B) Ends the processing of a cursor
- C) Deletes a cursor
- D) Creates a cursor

103. Which clause is used to assign values to variables in SQL?

- ☒ A) SET
- B) SELECT INTO
- C) DECLARE
- D) INITIATE

104. What is the purpose of the FETCH statement in cursor operations?

- A) To close a cursor
- ☒ B) To retrieve the next row in the result set
- C) To open a cursor
- D) To declare a cursor

105. How can you check if a cursor has reached the end of the result set?

- A) @@CURSOR_STATUS
- ☒ B) @@FETCH_STATUS
- C) @@ROWCOUNT
- D) @@VERSION

106. Which statement is used to remove a declared variable?

- ☒ A) DELETE VARIABLE
- B) DROP VARIABLE
- ☒ C) DEALLOCATE VARIABLE
- D) NULLIFY VARIABLE

107. How can you make a cursor read-only?

- ☒ A) DECLARE cursor_name READONLY
- B) DECLARE cursor_name CURSOR FOR READ
- C) DECLARE cursor_name FOR UPDATE
- ☒ D) DECLARE cursor_name CURSOR READONLY

108. Which of the following closes an open cursor and releases associated resources?

- ☒ A) DEALLOCATE
- B) CLOSE
- C) FETCH
- D) DELETE

109. What is an index in SQL?

- ☒ A) A structure to speed up queries
- B) A backup of a database
- C) A storage space for data
- D) A type of cursor

110. What is the primary purpose of denormalization in databases?

- ☒ A) To improve read performance
- B) To reduce data redundancy
- C) To normalize data
- D) To increase storage capacity

111. Which command is used to create an index on a table?

- ☒ A) CREATE INDEX
- B) CREATE VIEW
- C) CREATE TRIGGER
- D) CREATE PROCEDURE

112. What type of index is created automatically on primary keys?

- ☒ A) Clustered index
- B) Non-clustered index
- C) Composite index
- D) Full-text index

113. Which of the following best describes denormalization?

- ☒ A) Adding redundant data for faster retrieval
- B) Removing redundant data
- C) Normalizing data to 3NF
- D) Encrypting data

114. What is the major trade-off of denormalization?

- A) Increased storage space
- ☒ B) Reduced read performance
- C) Better data integrity
- D) Increased data normalization

115. How can indexing improve query performance?

- A) By reducing the need for joins
- ☒ B) By speeding up data retrieval
- C) By duplicating rows
- D) By adding more constraints

116. What is a non-clustered index?

- A) An index that stores pointers to the actual data
- B) An index that stores data in sorted order
- ☒ C) An index for text columns only
- D) An index for temporary tables only

117. Which of the following factors can negatively impact index performance?

- A) Frequent updates and deletions
- ☒ B) Use of SELECT queries
- C) Low data volume
- D) Use of WHERE clauses

118. How does denormalization affect transaction processing?

- A) It speeds up read transactions but may slow down writes.
- B) It speeds up write transactions but may slow down reads.
- ☒ C) It slows down both read and write transactions.
- D) It has no impact on transaction processing.

119. Which of the following queries benefits the most from a full-text index?

- A) `SELECT * FROM employees WHERE name LIKE '%John%'`
- B) `SELECT * FROM employees WHERE age = 30`
- C) `SELECT * FROM employees WHERE department = 'HR'`
- ☒ D) `SELECT * FROM employees WHERE salary > 50000`

120. What is the primary goal of database optimization?

- ☒ A) Improve query performance
- B) Increase data redundancy
- C) Reduce storage space
- D) Normalize data

121. Which of the following techniques can help optimize database performance?

- A) Indexing
- B) Denormalization
- C) Partitioning
- ☒ D) All of the above

122. How does normalization help with database optimization?

- ☒ A) Reduces data redundancy
- B) Increases data redundancy
- C) Slows down data retrieval
- D) Increases storage requirements

123. Which tool can be used to analyze and optimize SQL queries?

- ☒ A) SQL Profiler
- B) Visual Studio
- C) Data Flow Diagram
- D) MS Word

124. What role does partitioning play in database optimization?

- ☒ A) Divides large tables into smaller, more manageable parts
- B) Combines small tables into one large table
- C) Duplicates all data
- D) Deletes unwanted data

125. What is the function of a query execution plan?

- ☒ A) Shows the steps the database takes to execute a query
- B) Deletes duplicate records
- C) Creates backup tables
- D) Converts all queries to views