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