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# CS403 FINALTERM LATEST QUIZ SPRING 2026

## Part 1: Lectures 19–21 (Normalization & Functional Dependencies)

1. **Which of the following is defined as a relationship between attributes in a relation?** A) Integrity Constraint B) Functional Dependency C) Referral Constraint D) Join Dependency **Answer: B**
2. **In a functional dependency  $A \rightarrow B$ , A is known as the:** A) Dependent B) Determinant C) Candidate Key D) Primary Key **Answer: B**
3. **If  $A \rightarrow B$  and  $B \rightarrow C$ , then  $A \rightarrow C$  is known as which inference rule?** A) Reflexivity B) Augmentation C) Transitivity D) Decomposition **Answer: C**
4. **A relation is in 1NF if:** A) There are no partial dependencies B) There are no transitive dependencies C) All attribute values are atomic D) It has a primary key **Answer: C**
5. **A relation is in 2NF if it is in 1NF and:** A) There are no transitive dependencies B) No non-key attribute is functionally dependent on a part of a candidate key C) Every determinant is a candidate key D) It has no multi-valued dependencies **Answer: B**
6. **Eliminating partial functional dependencies is the primary goal of:** A) 1NF B) 2NF C) 3NF D) BCNF **Answer: B**
7. **A relation is in 3NF if it is in 2NF and has no:** A) Partial dependencies B) Transitive dependencies C) Atomic values D) Multi-valued attributes **Answer: B**
8. **In 3NF, a non-key attribute must not depend on:** A) The primary key B) Another non-key attribute C) A candidate key D) Itself **Answer: B**
9. **A relation where every determinant is a candidate key is in:** A) 2NF B) 3NF C) BCNF (Boyce-Codd Normal Form) D) 4NF **Answer: C**

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10. **The process of breaking a relation into smaller relations to reduce redundancy is called:** A) Aggregation B) Normalization C) Denormalization D) Generalization **Answer: B**
11. **Which normal form is stronger than 3NF?** A) 1NF B) 2NF C) BCNF D) None of the above **Answer: C**
12. **The rule that states "If  $A \subseteq B$ , then  $B \rightarrow A$ " is:** A) Transitivity B) Reflexivity C) Union D) Pseudo-transitivity **Answer: B**
13. **If  $A \rightarrow B$  and  $A \rightarrow C$ , then  $A \rightarrow BC$  is the:** A) Decomposition rule B) Union rule C) Composition rule D) Reflexivity rule **Answer: B**
14. **Functional dependencies are identified based on:** A) The data values currently in the table B) The requirements and logic of the real-world system C) The number of rows in the table D) The SQL version used **Answer: B**
15. **Normalization aims to minimize which of the following?** A) Performance B) Redundancy and update anomalies C) Data security D) Query complexity **Answer: B**
16. **A dependency where a non-key attribute depends on another non-key attribute is:** A) Partial dependency B) Transitive dependency C) Full functional dependency D) Trivial dependency **Answer: B**
17. **Which normal form handles multi-valued dependencies?** A) 3NF B) BCNF C) 4NF D) 2NF **Answer: C**
18. **Physical Database Design occurs after:** A) Logical Database Design B) Preliminary Study C) Implementation D) Maintenance **Answer: A**
19. **The goal of physical database design is to:** A) Define entities and relationships B) Optimize performance and ensure data integrity at the storage level C) Create E-R diagrams D) Minimize the number of tables **Answer: B**

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20. **Which of the following is a consideration in physical design?** A) Data types and field sizes B) Normalization to 3NF C) Identifying entities D) Defining cardinalities **Answer: A**
21. **A field that is used to link two tables is often a:** A) Primary Key B) Foreign Key C) Secondary Key D) Composite Key **Answer: B**
22. **The "Determinant" in an FD is located on the:** A) Right side B) Left side C) Both sides D) Neither side **Answer: B**
23. **If a relation has no partial dependencies, it is at least in:** A) 1NF B) 2NF C) 3NF D) BCNF **Answer: B**
24. **In 3NF, every non-key attribute must be:** A) Independent of the primary key B) Partially dependent on the primary key C) Fully functionally dependent on the primary key and nothing else D) A determinant **Answer: C**
25. **Decomposing a table into 2NF involves:** A) Creating new tables for partial dependencies B) Merging all attributes into one table C) Removing primary keys D) Adding more rows **Answer: A**
26. **Which anomaly occurs when deleting one piece of data results in the loss of other unrelated data?** A) Insert Anomaly B) Delete Anomaly C) Update Anomaly D) Select Anomaly **Answer: B**
27. **An "Update Anomaly" is caused by:** A) Missing data B) Redundant data C) Small file sizes D) Complex queries **Answer: B**
28. **In BCNF, we check dependencies for:** A) Only primary keys B) All determinants C) Only foreign keys D) Non-key attributes only **Answer: B**
29. **Physical design decisions are often driven by:** A) User interface preferences B) Response time and throughput requirements C) The number of entities in the E-R diagram D) The color of the forms **Answer: B**
30. **Which rule states "If  $A \rightarrow B$ , then  $AC \rightarrow BC$ "?** A) Reflexivity B) Augmentation C) Transitivity D) Decomposition **Answer: B**

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31. **Normalization is a:** A) Top-down approach B) Bottom-up approach (starting from attributes) C) Random approach D) Manual filing approach  
**Answer: B**
32. **A "Trivial" FD is one where:** A)  $A \rightarrow B$  and B is a subset of A B)  $A \rightarrow B$  and A is a subset of B C)  $A \rightarrow B$  and B is a primary key D)  $A \rightarrow B$  and A is a foreign key  
**Answer: A**
33. **The result of a decomposition should be:** A) Lossy B) Lossless (data can be reconstructed) C) Redundant D) Smaller in row count  
**Answer: B**
34. **If a table is in 3NF and all candidate keys are simple (single attribute), it is also in:** A) 4NF B) BCNF C) 5NF D) 1NF  
**Answer: B**
35. **The primary goal of 1NF is to remove:** A) Repeating groups/multi-valued attributes B) Transitive dependencies C) Foreign keys D) Joins  
**Answer: A**
36. **A partial dependency occurs when an attribute depends on:** A) The whole primary key B) Only a part of a composite primary key C) A non-key attribute D) A foreign key  
**Answer: B**
37. **Which is NOT a step in normalization?** A) Identifying FDs B) Removing partial dependencies C) Creating indexes D) Removing transitive dependencies  
**Answer: C**
38. **3NF is often considered "enough" for most:** A) Scientific applications B) Business/Commercial applications C) Operating systems D) Compiler designs  
**Answer: B**
39. **In physical design, "Designing Fields" involves choosing:** A) Table names B) Data types and constraints C) User roles D) ERD symbols  
**Answer: B**
40. **"Integrity" in databases refers to:** A) Speed B) Accuracy and consistency of data C) Number of users D) Storage size  
**Answer: B**

## Part 2: Lectures 22–24 (Physical Design, Denormalization & Partitioning)

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41. **Physical record size is determined by:** A) The number of entities B) Sum of field sizes plus overhead C) The SQL version D) The monitor resolution  
**Answer: B**
42. **Denormalization is the process of:** A) Moving from 1NF to 3NF B) Intentionally introducing redundancy to improve performance C) Removing all keys D) Deleting the database  
**Answer: B**
43. **Which is a common situation for denormalization?** A) To save disk space B) Frequent joins of large tables that slow down queries C) To ensure 3NF D) To reduce data redundancy  
**Answer: B**
44. **Horizontal Partitioning involves:** A) Splitting a table into columns B) Splitting a table into rows based on a criteria C) Merging two tables D) Creating a view  
**Answer: B**
45. **Vertical Partitioning involves:** A) Splitting a table by rows B) Splitting a table by columns/attributes C) Sorting the table D) Deleting columns  
**Answer: B**
46. **What is a major advantage of partitioning?** A) Increased redundancy B) Improved performance and easier management of large data C) Simplified SQL queries D) Smaller E-R diagrams  
**Answer: B**
47. **Data compression techniques are used to:** A) Increase field size B) Save storage space and reduce I/O C) Improve normalization D) Add more tables  
**Answer: B**
48. **A "Data Type" in SQL Server specifies:** A) The table name B) The kind of data that can be stored in a column C) The user password D) The server location  
**Answer: B**
49. **Which partitioning is useful for separating frequently accessed columns from rarely accessed ones?** A) Horizontal B) Vertical C) Diagonal D) Logical  
**Answer: B**

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50. **Replication in databases means:** A) Deleting data B) Keeping copies of data at multiple locations C) Normalizing to 4NF D) Using only one table  
**Answer: B**
51. **A disadvantage of denormalization is:** A) Faster queries B) Increased risk of data inconsistency/anomalies C) Smaller table sizes D) Fewer foreign keys  
**Answer: B**
52. **What is the primary trade-off in physical design?** A) Storage vs. Security B) Performance vs. Redundancy/Integrity C) Rows vs. Columns D) Colors vs. Fonts  
**Answer: B**
53. **Horizontal partitioning is often used in:** A) Small databases B) Distributed databases or data warehouses C) E-R diagrams D) Word processors  
**Answer: B**
54. **The "Range" of values for a field is part of:** A) Logical design B) Physical design constraints C) Normalization D) Conceptual design  
**Answer: B**
55. **Fixed-length fields are generally:** A) Slower than variable-length B) Faster to process but may waste space C) Not allowed in SQL D) Used for images only  
**Answer: B**
56. **"Field" is another name for:** A) Row B) Column/Attribute C) Table D) Index  
**Answer: B**
57. **A "Null" value in a field represents:** A) Zero B) Empty space C) Absence of data/Unknown D) A space character  
**Answer: C**
58. **Coding techniques (like using 'M' for Male) help in:** A) Increasing redundancy B) Saving space and improving efficiency C) Making data harder to read D) Removing primary keys  
**Answer: B**
59. **Which partitioning improves security by isolating sensitive columns?** A) Horizontal B) Vertical C) Global D) Local  
**Answer: B**

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60. **Physical design is specific to:** A) A specific DBMS (like SQL Server) B) Only the E-R model C) Manual systems D) The user's operating system only  
**Answer: A**

### Part 3: Lectures 25–31 (SQL Commands, Joins & Subqueries)

61. **SQL stands for:** A) Simple Query Language B) Structured Query Language C) Standard Query Logic D) Sequential Query List **Answer: B**

62. **Which category of SQL commands is used to define the structure of a database?** A) DML B) DDL (Data Definition Language) C) DCL D) TCL **Answer: B**

63. **Which SQL command is used to create a new table?** A) INSERT B) CREATE TABLE C) NEW TABLE D) ADD TABLE **Answer: B**

64. **The command to add a new column to an existing table is:** A) UPDATE TABLE B) ALTER TABLE C) CHANGE TABLE D) ADD COLUMN **Answer: B**

65. **Which command is used to remove all records from a table but keep the structure?** A) DELETE B) TRUNCATE C) DROP D) REMOVE **Answer: B**

66. **Which command is used to completely remove a table and its definition?** A) DELETE B) TRUNCATE C) DROP TABLE D) REMOVE **Answer: C**

67. **DML stands for:** A) Data Definition Language B) Data Manipulation Language C) Data Management Logic D) Data Mode List **Answer: B**

68. **Which SQL statement is used to extract data from a database?** A) EXTRACT B) SELECT C) GET D) OPEN **Answer: B**

69. **Which clause is used to filter records in a SELECT statement?** A) FROM B) WHERE C) GROUP BY D) ORDER BY **Answer: B**

70. **To get unique values from a column, use the keyword:** A) DIFFERENT B) DISTINCT C) UNIQUE D) ONLY **Answer: B**

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71. **The wildcard character used to represent "all columns" in SELECT is:** A) % B) \* C) ? D) # **Answer: B**
72. **Which operator is used to search for a pattern in a WHERE clause?** A) MATCH B) LIKE C) FIND D) BETWEEN **Answer: B**
73. **In the LIKE operator, the '%' character represents:** A) Exactly one character B) Zero or more characters C) A number D) An empty string **Answer: B**
74. **The ORDER BY clause defaults to:** A) Descending order B) Ascending order (ASC) C) Random order D) Insertion order **Answer: B**
75. **Which aggregate function counts the number of rows?** A) SUM() B) COUNT() C) MAX() D) AVG() **Answer: B**
76. **The GROUP BY clause is used with:** A) Logical operators B) Aggregate functions C) JOINS only D) DDL commands **Answer: B**
77. **Which clause is used to filter groups created by GROUP BY?** A) WHERE B) HAVING C) FILTER D) CHECK **Answer: B**
78. **What is the result of a SELECT statement without a WHERE clause on two tables?** A) Inner Join B) Cartesian Product (Cross Join) C) Union D) Intersection **Answer: B**
79. **A join that returns only matching rows from both tables is:** A) Left Join B) Inner Join C) Full Join D) Cross Join **Answer: B**
80. **An Outer Join returns:** A) Only matching rows B) Matching rows plus unmatched rows from one or both tables C) Only non-matching rows D) The product of both tables **Answer: B**
81. **A "Left Outer Join" returns:** A) All rows from the right table B) All rows from the left table and matching rows from the right C) Only rows unique to the left D) No rows **Answer: B**

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82. **Joining a table with itself is called a:** A) Recursive Join B) Self Join C) Auto Join D) Dual Join **Answer: B**
83. **A subquery is a query:** A) Written after a semicolon B) Nested inside another query C) That uses only one table D) That has no SELECT clause **Answer: B**
84. **Subqueries can be used in which clauses?** A) WHERE only B) SELECT and FROM only C) SELECT, FROM, WHERE, and HAVING D) Only DDL **Answer: C**
85. **The SQL command to change existing data in a table is:** A) ALTER B) MODIFY C) UPDATE D) CHANGE **Answer: C**
86. **To delete specific rows from a table, use:** A) REMOVE B) DELETE FROM C) DROP D) CLEAR **Answer: B**
87. **The 'AS' keyword is used for:** A) Sorting B) Aliasing (giving a temporary name) C) Filtering D) Joining **Answer: B**
88. **Which join returns only those rows from the first table that have no matches in the second?** A) Inner Join B) Semi Join C) Natural Join D) Equi Join **Answer: B**
89. **The primary key constraint ensures:** A) No duplicate values and no nulls B) Only no duplicates C) Only no nulls D) Case sensitivity **Answer: A**
90. **A "Foreign Key" refers to:** A) A key in the same table B) The primary key of another table C) Any non-key attribute D) A password **Answer: B**
91. **Data types like INT, VARCHAR, and DATE are part of:** A) DML B) DDL C) DCL D) TCL **Answer: B**
92. **Which SQL command is used to add data?** A) ADD B) INSERT INTO C) CREATE D) UPDATE **Answer: B**

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93. **What happens if you omit the WHERE clause in a DELETE statement?**  
A) Error B) Nothing C) All rows are deleted D) Only the first row is deleted  
**Answer: C**
94. **The BETWEEN operator is inclusive of:** A) Only the start value B) Only the end value C) Both start and end values D) Neither value **Answer: C**
95. **SQL Server is a type of:** A) Operating System B) RDBMS (Relational Database Management System) C) Spreadsheet D) Programming Language  
**Answer: B**
96. **To sort data in descending order, use:** A) DESC B) DOWN C) REVERSE D) DSC **Answer: A**
97. **Aggregate functions ignore:** A) Zeroes B) Negative numbers C) Null values D) Integers **Answer: C**
98. **Which operator is used to check for multiple possible values in a WHERE clause?** A) BETWEEN B) IN C) LIKE D) EXISTS **Answer: B**
99. **A query that uses an aggregate function must have non-aggregated columns in:** A) WHERE clause B) ORDER BY clause C) GROUP BY clause D) FROM clause **Answer: C**
100. **The SQL command to modify a table's structure is:** A) UPDATE B) ALTER TABLE C) CHANGE D) RENAME **Answer: B**

#### **Part 4: Lectures 32–36 (UI, File Organization & Hashing)**

101. **User Interface (UI) design focuses on:** A) Database structure B) User interaction and experience C) Normalization D) Physical storage **Answer: B**
102. **A "Form" in application design is used to:** A) Store data permanently B) Provide an interface for data entry and display C) Replace the DBMS D) Create indexes **Answer: B**

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103. **Which is a tip for a user-friendly interface?** A) Use many colors B) Maintain consistency in layout and terminology C) Hide the navigation D) Use complex jargon **Answer: B**
104. **"File Organization" refers to:** A) How tables are normalized B) How records are stored in blocks on disk C) How users are grouped D) How E-R diagrams are drawn **Answer: B**
105. **A "Sequential File" stores records:** A) Randomly B) In a specific order based on a key C) Only in memory D) Without any order **Answer: B**
106. **Which file organization allows for the fastest access to a specific record via a key?** A) Sequential B) Hashed/Direct C) Heap D) Text file **Answer: B**
107. **"Hashing" is a technique to:** A) Encrypt data B) Map a key to a specific disk address C) Sort records D) Normalize tables **Answer: B**
108. **A "Hash Function" converts:** A) Table name to database name B) A key value to a bucket/block address C) Rows to columns D) SQL to machine code **Answer: B**
109. **"Collision" in hashing occurs when:** A) Two different keys hash to the same address B) A query fails C) The database crashes D) Two users access the same row **Answer: A**
110. **A common method to handle collisions is:** A) Normalization B) Open addressing or Chaining C) Deleting the data D) Increasing the key size **Answer: B**
111. **"Heap File" organization means records are:** A) Sorted by primary key B) Placed wherever there is space C) Stored in a tree structure D) Hashed **Answer: B**
112. **The "Bucket" in hashing is:** A) A database user B) A unit of storage (one or more blocks) C) A SQL command D) A type of join **Answer: B**

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113. **Which file organization is best for range queries?** A) Hashed B) Indexed Sequential (or B+ Tree) C) Heap D) Random **Answer: B**
114. **The goal of UI design in DBMS is to:** A) Hide the database B) Make the system efficient and easy for users C) Show raw SQL D) Increase coding time **Answer: B**
115. **A "Menu" in an application helps in:** A) Data storage B) Navigation and command selection C) Normalization D) Query optimization **Answer: B**
116. **Direct access files are also called:** A) Sequential files B) Random access files C) Heap files D) Log files **Answer: B**
117. **Which is a characteristic of Hashed access?** A) Fast for exact matches B) Fast for range searches C) Slow for insertion D) Good for small files only **Answer: A**
118. **"Data Dictionary" stores:** A) Actual data B) Metadata (data about data) C) User passwords D) SQL history **Answer: B**
119. **The most basic unit of storage on a disk is:** A) Table B) Block/Sector C) Row D) Field **Answer: B**
120. **Index-based access is used to:** A) Slow down queries B) Speed up data retrieval C) Ensure 3NF D) Group data **Answer: B**

#### **Part 5: Lectures 37–41 (Indexing & Views)**

121. **An "Index" in a database is similar to:** A) A table of contents B) A book's index C) A footer D) A preface **Answer: B**
122. **A "Primary Index" is usually created on:** A) A non-key attribute B) The primary key C) Every column D) Foreign keys only **Answer: B**
123. **A "Clustered Index" determines:** A) The user permissions B) The physical order of data in the table C) The number of rows D) The color of the interface **Answer: B**

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124. **How many clustered indexes can a table have?** A) One B) Unlimited C) Two D) None **Answer: A**
125. **A "Non-Clustered Index" is:** A) Stored with the data B) Stored separately from the data rows C) Always slower than a heap scan D) Used for primary keys only **Answer: B**
126. **"Dense Index" contains an entry for:** A) Only some search key values B) Every search key value in the data file C) Only primary keys D) Only null values **Answer: B**
127. **"Sparse Index" contains entries for:** A) Every record B) Only some of the search key values C) Foreign keys only D) Non-key attributes **Answer: B**
128. **Which index type is faster for inserts but slower for searches?** A) Dense B) Sparse C) Clustered D) Multi-level **Answer: B**
129. **A "Multi-level Index" is used when:** A) The index itself becomes too large for memory B) There is only one table C) Data is very small D) No primary key exists **Answer: A**
130. **What is a "View"?** A) A physical table B) A virtual table based on a SELECT query C) A database backup D) A user profile **Answer: B**
131. **Views are used to:** A) Store data permanently B) Simplify complex queries and enhance security C) Replace normalization D) Speed up disk I/O **Answer: B**
132. **A "Materialized View" is:** A) Not stored on disk B) Physically stored on disk for performance C) Deleted after every query D) Only for scientific data **Answer: B**
133. **Can you update data through a view?** A) Never B) Sometimes, if certain conditions are met C) Always D) Only if the view has a join **Answer: B**

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134. **Which index is best for attributes with few unique values (low cardinality)?** A) B-Tree B) Bitmap Index (often used, though B-Tree is general) C) Clustered Index D) Sparse Index **Answer: B**
135. **The primary reason to use an index is to reduce:** A) Memory usage B) Disk I/O operations C) Table count D) User count **Answer: B**
136. **An index on a non-unique attribute is called:** A) Primary Index B) Secondary Index C) Unique Index D) Null Index **Answer: B**
137. **Which command creates a view?** A) ADD VIEW B) CREATE VIEW C) NEW VIEW D) MAKE VIEW **Answer: B**
138. **A "Composite Index" is an index on:** A) One column B) Multiple columns C) One table D) Multiple databases **Answer: B**
139. **Indexes can speed up which operations?** A) SELECT and WHERE B) INSERT and UPDATE C) Both A and B D) Neither A nor B (Indexes slow down Inserts/Updates) **Answer: A** (Note: They slow down DML like Insert/Update because the index must be updated).
140. **A "Covering Index" is an index that:** A) Covers the whole disk B) Contains all columns needed for a query C) Covers the primary key only D) Is used only for backups **Answer: B**
141. **A view that combines data from multiple tables is called a:** A) Simple View B) Complex View C) Joined View D) Multi-View **Answer: B**
142. **Dropping a view deletes:** A) The underlying table data B) Only the view definition C) The database D) All indexes **Answer: B**
143. **Which index structure is most common in RDBMS?** A) Linked List B) B-Tree/B+ Tree C) Stack D) Queue **Answer: B**
144. **The "Search Key" in an index is:** A) The password B) The attribute used to find records C) The SQL command D) The table name **Answer: B**

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145. **"Index Overheads" include:** A) Faster selects B) Extra storage and slower updates/inserts C) More users D) Fewer tables **Answer: B**
146. **What is "Data Independence" as provided by views?** A) Users can work without a database B) Users are shielded from changes in physical/logical structure C) Data is stored on separate disks D) Each user has their own data copy **Answer: B**
147. **To focus on specific data and hide sensitive columns, we use:** A) Normalization B) Views C) Joins D) Hashing **Answer: B**
148. **A "Clustered" table means:** A) It has many users B) Its rows are stored in the order of the clustered index C) It is part of a cluster server D) It has no primary key **Answer: B**
149. **"Index Sequential Access Method" (ISAM) uses:** A) Only hashing B) Both sequential and indexed access C) Only heap files D) No keys **Answer: B**
150. **Multi-level indexing reduces search time to:** A)  $O(N)$  B)  $O(\log N)$  C)  $O(1)$  D)  $O(N^2)$  **Answer: B**

#### **Part 6: Lectures 42–45 (Transactions & Concurrency Control)**

151. **A "Transaction" is a unit of work that must be:** A) Partial B) Atomic (all or nothing) C) Slow D) Redundant **Answer: B**
152. **ACID properties stand for:** A) Atomicity, Consistency, Integrity, Durability B) Atomicity, Consistency, Isolation, Durability C) Access, Control, Integrity, Data D) Accuracy, Consistency, Isolation, Database **Answer: B**
153. **"Atomicity" ensures that:** A) Data is accurate B) Either all operations of a transaction happen or none do C) The database is fast D) Many users can access at once **Answer: B**
154. **"Consistency" ensures the database moves from:** A) One disk to another B) One valid state to another valid state C) Normal to denormal state D) SQL to Oracle **Answer: B**

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155. **"Isolation" means:** A) The database is offline B) Concurrent transactions do not interfere with each other C) Data is stored in one file D) Only one user exists **Answer: B**
156. **"Durability" ensures that:** A) The database is strong B) Changes are permanent even after a system failure C) Data is encrypted D) The system never crashes **Answer: B**
157. **A "Schedule" is:** A) A meeting time B) A sequence of operations from multiple transactions C) A database backup plan D) A user login list **Answer: B**
158. **A "Serial Schedule" is one where:** A) Transactions overlap B) Transactions are executed one after another without overlap C) Operations are random D) No transaction is completed **Answer: B**
159. **"Concurrency Control" is needed to prevent:** A) Fast queries B) Lost updates, inconsistent analysis, and uncommitted data problems C) Normalization D) SQL errors **Answer: B**
160. **"Locking" is a mechanism to:** A) Secure the server room B) Prevent multiple transactions from accessing the same data simultaneously in conflicting ways C) Encrypt columns D) Delete records **Answer: B**
161. **A "Shared Lock" (S-lock) allows:** A) Writing only B) Reading only C) Both reading and writing D) Neither **Answer: B**
162. **An "Exclusive Lock" (X-lock) allows:** A) Only reading B) Both reading and writing C) Only other users to read D) No access at all **Answer: B**
163. **"Two-Phase Locking" (2PL) protocol ensures:** A) Fast transactions B) Serializability C) No deadlocks D) Atomicity **Answer: B**
164. **The two phases of 2PL are:** A) Start and End B) Growing (acquiring locks) and Shrinking (releasing locks) C) Reading and Writing D) Lock and Key **Answer: B**

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165. **A "Deadlock" occurs when:** A) The server is off B) Two or more transactions are waiting for each other to release locks C) A transaction is too fast D) A query has a typo **Answer: B**
166. **To detect a deadlock, the DBMS uses a:** A) E-R Diagram B) Wait-for Graph C) Flowchart D) Pie chart **Answer: B**
167. **A cycle in a "Wait-for Graph" indicates:** A) High performance B) A Deadlock C) A completed transaction D) Data consistency **Answer: B**
168. **"Deadlock Resolution" usually involves:** A) Restarting the server B) Aborting/Rolling back one of the transactions C) Adding more RAM D) Renormalizing **Answer: B**
169. **A "Timestamp" is used to:** A) Show the current time only B) Uniquely identify the start time of a transaction for ordering C) Count rows D) Measure query speed **Answer: B**
170. **"Rollback" means:** A) Saving changes B) Undoing changes made by a transaction C) Moving to the next row D) Sorting backwards **Answer: B**
171. **"Commit" means:** A) Aborting a transaction B) Permanently saving transaction changes C) Locking a table D) Deleting data **Answer: B**
172. **The "Uncommitted Update" problem is also called:** A) Lost Update B) Dirty Read C) Phantoms D) Consistent Read **Answer: B**
173. **In "Timestamp Ordering", if a transaction tries to read data already updated by a younger transaction:** A) It is allowed B) It is rolled back C) It waits D) It ignores the change **Answer: B**
174. **"Serializability" means the execution of concurrent transactions is equivalent to:** A) A random execution B) Some serial execution of those transactions C) A parallel execution on two servers D) A failed execution **Answer: B**

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175. **The "Lost Update" problem occurs when:** A) A row is deleted B) Two transactions update the same data, and one overwrites the other C) The database crashes D) A query returns zero rows **Answer: B**
176. **A "Log File" is used for:** A) Performance monitoring B) Recovery and tracking transaction changes C) User manuals D) Sorting data **Answer: B**
177. **"Deferred Update" means changes are written to the database:** A) Immediately B) Only after the transaction commits C) Randomly D) Never **Answer: B**
178. **"Immediate Update" means changes are written to the database:** A) After 1 hour B) As they occur, even before commit C) Only manually D) On system restart **Answer: B**
179. **A "Checkpoint" is a point in the log where:** A) The transaction starts B) All previous updates are guaranteed to be on disk C) The user logs out D) The system crashes **Answer: B**
180. **Which problem occurs when a transaction reads data that is in the middle of being updated?** A) Lost Update B) Inconsistent Analysis C) Dirty Read D) Phantom Read **Answer: B**
181. **"Cascading Rollback" occurs when:** A) One rollback causes others to also rollback B) The disk is full C) The server restarts D) Queries are slow **Answer: A**
182. **"Strict 2PL" prevents:** A) Deadlocks B) Cascading rollbacks by holding exclusive locks until commit C) All reads D) Joins **Answer: B**
183. **In a deadlock, the transaction selected to be aborted is called the:** A) Leader B) Victim C) Master D) Slave **Answer: B**
184. **Which property ensures that a transaction is a "Black Box"?** A) Atomicity B) Isolation C) Consistency D) Durability **Answer: B**

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185. **Locking granularity refers to:** A) The speed of the lock B) The size of the data item being locked (database, table, or row) C) The number of users D) The color of the lock **Answer: B**
186. **"Starvation" in concurrency occurs when:** A) The server has no power B) A transaction waits indefinitely while others get locks C) No data is in the table D) The log file is full **Answer: B**
187. **The "Recovery Manager" is responsible for:** A) Writing SQL B) Ensuring ACID properties after a failure C) Designing E-R diagrams D) Managing user passwords **Answer: B**
188. **A "Conflict" between operations occurs if they are from different transactions, on the same item, and:** A) Both are Reads B) At least one is a Write C) Both are Selects D) Both are from the same user **Answer: B**
189. **Optimistic Concurrency Control assumes:** A) Conflicts are common B) Conflicts are rare C) The database will always fail D) No locks are needed ever **Answer: B**
190. **Pessimistic Concurrency Control uses:** A) No locks B) Locking and blocking C) Only timestamps D) Only backups **Answer: B**
191. **What does "T" represent in a transaction log entry?** A) Table B) Transaction ID C) Time D) Total **Answer: B**
192. **The "Wait-Die" and "Wound-Wait" schemes are used for:** A) Deadlock prevention B) Hashing C) Normalization D) Indexing **Answer: A**
193. **Which scheme aborts the younger transaction if it requests a lock held by an older one?** A) Wait-Die B) Wound-Wait C) 2PL D) B-Tree **Answer: B**
194. **A transaction in the "Aborted" state has:** A) Completed successfully B) Failed and been rolled back C) Started writing D) Been locked **Answer: B**
195. **"Shadow Paging" is a technique for:** A) Indexing B) Recovery without log files C) UI design D) Normalization **Answer: B**

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196. **"Multiversion Concurrency Control" (MVCC) maintains:** A) Only one version of data B) Multiple versions of data for different transactions C) Multiple databases D) No data **Answer: B**
197. **Which isolation level is the highest (most restrictive)?** A) Read Uncommitted B) Serializable C) Read Committed D) Repeatable Read **Answer: B**
198. **"Phantoms" are rows that:** A) Disappear B) Appear in a later read of the same query within a transaction C) Have no primary key D) Are null **Answer: B**
199. **A "Critical Section" in transactions refers to:** A) The UI code B) Code that accesses shared resources C) The E-R diagram D) The footer of the page **Answer: B**
200. **"Force Writing" the log to disk happens:** A) Every minute B) At transaction commit C) Only on restart D) Never **Answer: B**
201. **Which DDL command is used to add a Primary Key to an existing table?** A) UPDATE TABLE B) ALTER TABLE C) MODIFY TABLE D) SET PRIMARY KEY **Answer: B**
202. **If a system crashes, the "Redo" operation is performed on transactions that:** A) Failed B) Committed but might not be on disk C) Never started D) Were rolled back **Answer: B**
203. **The "Undo" operation is performed on transactions that:** A) Committed B) Were active at the time of crash C) Never accessed data D) Were successful **Answer: B**
204. **A "Transaction Manager" coordinates:** A) Disk speed B) The execution of transactions C) User registration D) Network traffic **Answer: B**

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205. **Normalization to 3NF specifically removes which problem?** A) Multi-valued attributes B) Transitive dependencies C) Joins D) Primary keys

**Answer: B**



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