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Database System Quiz (01/11/2025)

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* Required

1. Name: * 📖

   Ritik Raj

2. Class Roll: * 📖

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3. Question 1: Which of the following best defines a functional dependency?
   📖 ⬦

   ◯ B. A constraint between tables

   ◯ C. A property of the schema that links databases

   ⦿ A. A relationship between two attributes

   ◯ D. A dependency between two tuples

4. Question 2: If X determines Y, which of the following holds true? 📖 ⬦

   ◯ B. If two tuples have the same Y, they must have the same X

   ◯ C. X and Y are independent

   ◯ D. Y determines X

A. If two tuples have the same X, they must have the same Y

5. Question 3: Which of the following inference rules states: If Y is a subset of X, then X determines Y?

- A. Reflexive
- B. Transitive
- C. Augmentation
- D. Decomposition

6. Question 4: The transitive rule in functional dependencies can be expressed as:

- B. If X -> Z and Z -> Y, then X -> Y
- A. If X -> Y and Y -> Z, then X -> Z
- C. If X -> Y, then Y -> X
- D. If X -> Y and X -> Z, then Y -> Z

7. Question 5: Which inference rule allows attributes to be added to both sides of a dependency?

- B. Union
- C. Decomposition
- D. Transitive
- A. Augmentation

8. Question 6: If X -> YZ, then X -> Y and X -> Z. This rule is known as: 📖 ◇

   ⬤ A. Decomposition

   ◯ B. Union

   ◯ C. Reflexive

   ◯ D. Pseudotransitivity

9. Question 7: If X -> Y and X -> Z, then X -> YZ. This rule is called: 📖

   ◯ A. Union

   ◯ B. Decomposition

   ◯ C. Augmentation

   ◯ D. Reflexive

10. Question 8: If X -> Y and WY -> Z, then WX -> Z. This rule is known as: 📖 ◇

    ◯ B. Transitive

    ⬤ A. Pseudotransitivity

    ◯ C. Union

    ◯ D. Reflexive

11. Question 9: Armstrong's axioms are used to: 📖 ◇

    ◯ B. Check referential integrity

    ⬤ A. Infer all possible functional dependencies
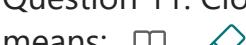
○ C. Test foreign key relationships

○ D. Determine primary keys

12. Question 10: Which of the following is not part of Armstrong's axioms?

○ B. Transitive

○ C. Reflexive

◉ A. Union

○ D. Augmentation

13. Question 11: Closure of a set of functional dependencies F, denoted as F+, means:

◉ A. All FDs that can be inferred from F

○ B. Only minimal FDs

○ C. Only FDs that violate BCNF

○ D. A subset of candidate keys

14. Question 12: Closure of attributes X with respect to F, denoted X+, means:

○ B. All keys in the relation

◉ A. All attributes functionally determined by X

○ C. All redundant attributes

○ D. All transitive attributes

15. Question 13: If F and G are equivalent sets of FDs, it means:

○ B. F covers G but not vice versa

○ C. They have the same number of dependencies

⦿ A. F+ = G+

○ D. They are defined on different relations

16. Question 14: If F covers G, it means:

○ B. Every FD in F can be inferred from G

○ C. Both F and G have no overlap

⦿ A. Every FD in G can be inferred from F

○ D. They are mutually exclusive

17. Question 15: The closure of attributes is useful to determine:

⦿ A. Candidate keys

○ B. Primary key selection only

○ C. Null values

○ D. Referential integrity

18. Question 16: Which of the following statements is true?

○ B. Every non-key attribute determines the key

○ C. A key cannot have dependencies

○ A. If K is a key, then K functionally determines all attributes

○ D. Only foreign keys determine attributes

19. Question 17: Functional dependencies are derived from:

● A. The semantics and interrelationships of data attributes

○ B. Database size

○ C. Normalization

○ D. Physical storage details

20. Question 18: Which of the following indicates a violation of functional dependency?

○ B. X and Y have same domain

● A. Two tuples have same X but different Y values

○ C. X and Y are both keys

○ D. All attributes are atomic

21. Question 19: To find the closure X+ of attribute set X, we repeatedly apply:

○ B. Join operations

○ C. Aggregation functions

○ D. Normalization steps

● A. Armstrong's inference rules

22. Question 20: If A -> B and B -> C hold, then A -> C by which rule? 📖 ◇

○ B. Reflexive

○ C. Union

◉ A. Transitive

○ D. Augmentation

23. Question 21: If X -> Y and Z -> W, which of the following is valid by union rule?
📖 ◇

○ B. X -> YW

○ C. X -> Y

◉ A. XZ -> YW

○ D. Z -> X

24. Question 22: Which rule allows us to remove attributes from the right-hand side? 📖 ◇

○ B. Union

○ C. Transitive

○ D. Augmentation

◉ A. Decomposition

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