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| True / False |

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| 1. The practical significance of taking the logical view of a database is that it serves as a reminder of the simple file concept of data storage.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-1 A Logical View of Data | | *LEARNING OBJECTIVES:* | 03.01 - Describe the relational database model’s logical structure | |

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| 2. You can think of a table as a persistent representation of a logical relation.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-1a Tables and Their Characteristics | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 3. The order of the rows and columns is important to the DBMS.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-1a Tables and Their Characteristics | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 4. Character data can contain any character or symbol intended for mathematical manipulation.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-1a Tables and Their Characteristics | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 5. Each table in a relational database must have a primary key.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-1a Tables and Their Characteristics | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 6. The row’s range of permissible values is known as its domain.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-1a Tables and Their Characteristics | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 7. The idea of determination is unique to the database environment.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-2a Dependencies | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 8. Only a single attribute, not multiple attributes, can define functional dependence.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-2a Dependencies | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 9. If the attribute (B) is functionally dependent on a composite key (A) but not on any subset of that composite key, the attribute (B) is fully functionally dependent on (A).   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-2a Dependencies | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 10. A null is created when you press the Enter key or the Tab key to move to the next entry without making a prior entry of any kind.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-2b Types of Keys | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 11. Depending on the sophistication of the application development software, nulls can create problems when functions such as COUNT, AVERAGE, and SUM are used.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-2b Types of Keys | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 12. RDBMSs enforce integrity rules automatically.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-3 Integrity Rules | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 13. Relational algebra defines the theoretical way of manipulating table contents using relational operators.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4 Relational Algebra | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 14. The SELECT operator yields a vertical subset of a table.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 15. The DIFFERENCE operator subtracts one table from the other.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 16. In a natural join, the column on which the join was made occurs twice in the new table.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 17. The DIVIDE operation uses one single-column table (e.g., column “a”) as the divisor and one two-column table (e.g., columns “a” and “b”) as the dividend.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 18. A data dictionary is sometimes described as “the database designer’s database” because it records the design decisions about tables and their structures.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-5 The Data Dictionary and the System Catalog | | *LEARNING OBJECTIVES:* | 03.04 - Explain the purpose and components of the data dictionary and system catalog | |

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| 19. The one-to-many (1:M) relationship is easily implemented in the relational model by putting the foreign key of the “1” side in the table of the “many” side as a primary key.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-6a The 1:M Relationship | | *LEARNING OBJECTIVES:* | 03.05 - Identify appropriate entities and then the relationships among the entities in the relational database model | |

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| 20. As rare as 1:1 relationships should be, certain conditions absolutely require their use.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-6b The 1:1 Relationship | | *LEARNING OBJECTIVES:* | 03.05 - Identify appropriate entities and then the relationships among the entities in the relational database model | |

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| Multiple Choice |

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| 21. \_\_\_\_\_ logic, used extensively in mathematics, provides a framework in which an assertion (statement of fact) can be verified as either true or false.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Predicate | b. | Database | |  | c. | Relational | d. | Index |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-1 A Logical View of Data | | *LEARNING OBJECTIVES:* | 03.01 - Describe the relational database model’s logical structure | |

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| 22. Each table \_\_\_\_\_ represents an attribute.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | column | b. | row | |  | c. | dimension | d. | value |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-1a Tables and Their Characteristics | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 23. Date attributes contain calendar dates stored in a special format known as the \_\_\_\_\_ date format.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Epoch | b. | calendar | |  | c. | Julian | d. | logical |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-1a Tables and Their Characteristics | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 24. In the relational model, \_\_\_\_\_ are important because they are used to ensure that each row in a table is uniquely identifiable.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | relations | b. | keys | |  | c. | indexes | d. | logical structures |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-2 Keys | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 25. A \_\_\_\_\_ is any key that uniquely identifies each row.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | superkey | b. | special key | |  | c. | foreign key | d. | candidate key |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-2b Types of Keys | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 26. A \_\_\_\_\_ key can be described as a minimal superkey, a superkey without any unnecessary attributes.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | secondary | b. | candidate | |  | c. | primary | d. | foreign |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-2b Types of Keys | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 27. A \_\_\_\_\_ is the primary key of one table that has been placed into another table to create a common attribute.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | superkey | b. | composite primary key | |  | c. | candidate key | d. | foreign key |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-2b Types of Keys | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 28. A \_\_\_\_\_ key is defined as a key that is used strictly for data retrieval purposes.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | lookup | b. | foreign | |  | c. | candidate | d. | secondary |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-2b Types of Keys | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 29. Referential \_\_\_\_\_ dictates that the foreign key must contain values that match the primary key in the related table, or must contain null.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | integrity | b. | uniqueness | |  | c. | model | d. | attribute |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-3 Integrity Rules | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 30. The CUSTOMER table’s primary key is CUS\_CODE. The CUSTOMER primary key column has no null entries, and all entries are unique. This is an example of \_\_\_\_\_ integrity.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | entity | b. | referential | |  | c. | relational | d. | null |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-3 Integrity Rules | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 31. The \_\_\_\_\_ constraint can be placed on a column to ensure that every row in the table has a value for that column.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | UNIQUE | b. | NOT NULL | |  | c. | VALUE | d. | EMPTY |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-3 Integrity Rules | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 32. To be considered minimally relational, the DBMS must support the key relational operators \_\_\_\_\_, PROJECT, and JOIN.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | INTERSECT | b. | UNION | |  | c. | DIFFERENCE | d. | SELECT |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4 Relational Algebra | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 33. \_\_\_\_\_, also known as RESTRICT, yields values for all rows found in a table that satisfy a given condition.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | INTERSECT | b. | UNION | |  | c. | DIFFERENCE | d. | SELECT |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 34. \_\_\_\_\_ returns only the attributes requested, in the order in which they are requested.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | PROJECT | b. | SELECT | |  | c. | UNION | d. | DIFFERENCE |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 35. When two or more tables share the same number of columns, and when their corresponding columns share the same or compatible domains, they are said to be \_\_\_\_\_.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | intersect-compatible | b. | union-compatible | |  | c. | difference-compatible | d. | select-compatible |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 36. A(n) \_\_\_\_\_ join links tables by selecting only the rows with common values in their common attribute(s).   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | attribute | b. | unique | |  | c. | foreign | d. | natural |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 37. \_\_\_\_\_ are especially useful when you are trying to determine what values in related tables cause referential integrity problems.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Inner joins | b. | Outer joins | |  | c. | Equijoins | d. | Theta joins |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 38. A(n) \_\_\_\_\_ only returns matched records from the tables that are being joined.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | outer join | b. | inner join | |  | c. | equijoin | d. | theta join |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 39. A \_\_\_\_\_ contains at least all of the attribute names and characteristics for each table in the system.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | data dictionary | b. | relational schema | |  | c. | logical schema | d. | database |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-5 The Data Dictionary and the System Catalog | | *LEARNING OBJECTIVES:* | 03.04 - Explain the purpose and components of the data dictionary and system catalog | |

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| 40. The \_\_\_\_\_ is actually a system-created database whose tables store the user/designer-created database characteristics and contents.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | database tuple | b. | systematic database | |  | c. | unique index | d. | system catalog |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-5 The Data Dictionary and the System Catalog | | *LEARNING OBJECTIVES:* | 03.04 - Explain the purpose and components of the data dictionary and system catalog | |

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| 41. In a database context, the word \_\_\_\_\_ indicates the use of the same attribute name to label different attributes.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | redundancy | b. | homonym | |  | c. | duplicate | d. | synonym |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-5 The Data Dictionary and the System Catalog | | *LEARNING OBJECTIVES:* | 03.04 - Explain the purpose and components of the data dictionary and system catalog | |

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| 42. In a database context, a(n) \_\_\_\_\_ indicates the use of different names to describe the same attribute.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | entity | b. | duplicate | |  | c. | synonym | d. | homonym |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-5 The Data Dictionary and the System Catalog | | *LEARNING OBJECTIVES:* | 03.04 - Explain the purpose and components of the data dictionary and system catalog | |

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| 43. The \_\_\_\_\_ relationship is the “relational model ideal.”   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | 1:1 | b. | 1:M | |  | c. | M:1 | d. | M:N |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-6 Relationships within the Relational Database | | *LEARNING OBJECTIVES:* | 03.05 - Identify appropriate entities and then the relationships among the entities in the relational database model | |

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| 44. The \_\_\_\_\_ relationship should be rare in any relational database design.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | 1:1 | b. | 1:M | |  | c. | M:1 | d. | M:N |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-6 Relationships within the Relational Database | | *LEARNING OBJECTIVES:* | 03.05 - Identify appropriate entities and then the relationships among the entities in the relational database model | |

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| 45. \_\_\_\_\_ relationships can be implemented by creating a new entity in 1:M relationships with the original entities.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | 1:N | b. | M:1 | |  | c. | M:N | d. | 1:1 |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-6c The M:N Relationship | | *LEARNING OBJECTIVES:* | 03.05 - Identify appropriate entities and then the relationships among the entities in the relational database model | |

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| 46. Another name for a composite entity is a(n) \_\_\_\_\_ entity.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | bridge | b. | linked | |  | c. | directive | d. | associative |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-6c The M:N Relationship | | *LEARNING OBJECTIVES:* | 03.05 - Identify appropriate entities and then the relationships among the entities in the relational database model | |

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| 47. A(n) \_\_\_\_\_ is an orderly arrangement used to logically access rows in a table.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | primary rule | b. | superkey | |  | c. | relationship | d. | index |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-8 Indexes | | *LEARNING OBJECTIVES:* | 03.07 - Explain the purpose of indexing in a relational database | |

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| 48. When you define a table’s primary key, the DBMS automatically creates a(n) \_\_\_\_\_ index on the primary key column(s) you declared.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | key | b. | composite | |  | c. | unique | d. | primary |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-8 Indexes | | *LEARNING OBJECTIVES:* | 03.07 - Explain the purpose of indexing in a relational database | |

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| 49. According to Codd’s \_\_\_\_\_ rule of relational databases, application programs and ad hoc facilities are logically unaffected when changes are made to the table structures that preserve the original table values (changing order of columns or inserting columns).   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | distribution independence | b. | logical data independence | |  | c. | comprehensive data sublanguage | d. | integrity independence |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-9 Codd’s Relational Database Rules | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 50. According to Codd's \_\_\_\_\_ rule of relational databases, if the system supports low-level access to the data, users must not be allowed to bypass the integrity rules of the database.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | nonsubversion | b. | information | |  | c. | guaranteed access | d. | view updating |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-9 Codd’s Relational Database Rules | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 51. A table is also called a(n) \_\_\_\_\_ because the relational model’s creator, E. F. Codd, used the two terms as synonyms.   |  |  | | --- | --- | | *ANSWER:* | relation | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-1a Tables and Their Characteristics | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 52. In a relational table, each column has a specific range of values known as the \_\_\_\_\_ domain.   |  |  | | --- | --- | | *ANSWER:* | attribute | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-1a Tables and Their Characteristics | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 53. A primary key is a(n) \_\_\_\_\_ key chosen to be the primary means by which rows of a table are uniquely identified.   |  |  | | --- | --- | | *ANSWER:* | candidate | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-1a Tables and Their Characteristics | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 54. In a relational model, \_\_\_\_\_ are used to establish relationships among tables and to ensure the integrity of the data.   |  |  | | --- | --- | | *ANSWER:* | keys | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-2 Keys | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 55. To avoid nulls, some designers use special codes, known as \_\_\_\_\_, to indicate the absence of some value.   |  |  | | --- | --- | | *ANSWER:* | flags | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-3 Integrity Rules | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 56. The relational operators have the property of \_\_\_\_\_; that is, the use of relational algebra operators on existing relations (tables) produces new relations.   |  |  | | --- | --- | | *ANSWER:* | closure | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 57. PRODUCT yields all possible pairs of rows from two tables, also known as the \_\_\_\_\_ product.   |  |  | | --- | --- | | *ANSWER:* | Cartesian | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 58. \_\_\_\_\_ is the real power behind the relational database, allowing the use of independent tables linked by common attributes.   |  |  | | --- | --- | | *ANSWER:* | JOIN | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 59. A(n) \_\_\_\_\_ links tables on the basis of an equality condition that compares specified columns of each table.   |  |  | | --- | --- | | *ANSWER:* | equijoin | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 60. A(n) \_\_\_\_\_\_ provides a detailed description of all tables found within the user/designer-created database.   |  |  | | --- | --- | | *ANSWER:* | data dictionary | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-5 The Data Dictionary and the System Catalog | | *LEARNING OBJECTIVES:* | 03.04 - Explain the purpose and components of the data dictionary and system catalog | |

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| 61. The \_\_\_\_\_ catalog can be described as a detailed system data dictionary that describes all objects within the database, including data about table names, the table’s creator and creation date, the number of columns in each table, the data type corresponding to each column, index filenames, index creators, authorized users, and access privileges.   |  |  | | --- | --- | | *ANSWER:* | system | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-5 The Data Dictionary and the System Catalog | | *LEARNING OBJECTIVES:* | 03.04 - Explain the purpose and components of the data dictionary and system catalog | |

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| 62. The \_\_\_\_\_ relationship is the relational database norm.   |  |  | | --- | --- | | *ANSWER:* | 1:M | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-6a The 1:M Relationship | | *LEARNING OBJECTIVES:* | 03.05 - Identify appropriate entities and then the relationships among the entities in the relational database model | |

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| 63. \_\_\_\_\_ relationships cannot be implemented as such in the relational model.   |  |  | | --- | --- | | *ANSWER:* | M:N | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-6c The M:N Relationship | | *LEARNING OBJECTIVES:* | 03.05 - Identify appropriate entities and then the relationships among the entities in the relational database model | |

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| 64. If one department chair—a professor—can chair only one department, and one department can have only one department chair. The entities PROFESSOR and DEPARTMENT exhibit a(n) \_\_\_\_\_ relationship.   |  |  | | --- | --- | | *ANSWER:* | 1:1 | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-6b The 1:1 Relationship | | *LEARNING OBJECTIVES:* | 03.05 - Identify appropriate entities and then the relationships among the entities in the relational database model | |

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| 65. One characteristic of generalization hierarchies is that they are implemented as \_\_\_\_\_ relationships.   |  |  | | --- | --- | | *ANSWER:* | 1:1 | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-6b The 1:1 Relationship | | *LEARNING OBJECTIVES:* | 03.05 - Identify appropriate entities and then the relationships among the entities in the relational database model | |

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| 66. The proper use of \_\_\_\_\_ keys is crucial to controlling data redundancy.   |  |  | | --- | --- | | *ANSWER:* | foreign | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-7 Data Redundancy Revisited | | *LEARNING OBJECTIVES:* | 03.06 - Describe how data redundancy is handled in the relational database model | |

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| 67. Proper data \_\_\_\_\_ design requires carefully defined and controlled data redundancies to function properly.   |  |  | | --- | --- | | *ANSWER:* | warehousing | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-7 Data Redundancy Revisited | | *LEARNING OBJECTIVES:* | 03.06 - Describe how data redundancy is handled in the relational database model | |

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| 68. A(n) \_\_\_\_\_ index is an index in which the index key can have only one pointer value (row) associated with it.   |  |  | | --- | --- | | *ANSWER:* | unique | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-8 Indexes | | *LEARNING OBJECTIVES:* | 03.07 - Explain the purpose of indexing in a relational database | |

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| 69. An index key can have multiple \_\_\_\_\_ (a composite index).   |  |  | | --- | --- | | *ANSWER:* | attributes | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 3-8 Indexes | | *LEARNING OBJECTIVES:* | 03.07 - Explain the purpose of indexing in a relational database | |

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| 70. Dr. Codd’s \_\_\_\_\_ rule of relational database states that every value in a table is guaranteed to be accessible through a combination of table name, primary key value, and column name.   |  |  | | --- | --- | | *ANSWER:* | guaranteed Access | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-9 Codd’s Relational Database Rules | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 71. What is a key and how is it important in a relational model?   |  |  | | --- | --- | | *ANSWER:* | In a relational model, keys are important because they are used to ensure that each row in a table is uniquely identifiable. They are also used to establish relationships among tables and to ensure the integrity of the data. A key consists of one or more attributes that determine other attributes. For example, an invoice number identifies all of the invoice attributes, such as the invoice date and the customer name. | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-2 Keys | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 72. Define entity integrity. What are the two requirements to ensure entity integrity?   |  |  | | --- | --- | | *ANSWER:* | Entity integrity is the condition in which each row (entity instance) in the table has its own unique identity. To ensure entity integrity, the primary key has two requirements:  (1) all of the values in the primary key must be unique. (2) no key attribute in the primary key can contain a null. | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-2b Types of Keys | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 73. Describe the use of null values in a database.   |  |  | | --- | --- | | *ANSWER:* | Null values are problematic in a relational model. A null is the absence of any data value, and it is never allowed in any part of the primary key. From a theoretical perspective, it can be argued that a table that contains a null is not properly a relational table at all. From a practical perspective, however, some nulls cannot be reasonably avoided. For example, not all students have a middle initial. As a general rule, nulls should be avoided as much as reasonably possible. In fact, an abundance of nulls is often a sign of a poor design. Also, nulls should be avoided in the database because their meaning is not always identifiable. For example, a null could represent:  • An unknown attribute value.  • A known, but missing, attribute value.  • A “not applicable” condition. | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-2b Types of Keys | | *LEARNING OBJECTIVES:* | 03.02 - Identify the relational model’s basic components and explain the structure, contents, and characteristics of a relational table | |

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| 74. Describe the use of the INTERSECT operator.   |  |  | | --- | --- | | *ANSWER:* | INTERSECT yields only the rows that appear in both tables. As with UNION, the tables must be union-compatible to yield valid results. For example, you cannot use INTERSECT if one of the attributes is numeric and one is character-based. For the rows to be considered the same in both tables and appear in the result of the INTERSECT, the entire rows must be exact duplicates. | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-4b Relational Set Operators | | *LEARNING OBJECTIVES:* | 03.03 - Use relational database operators to manipulate relational table contents | |

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| 75. Define an index. Explain the role of indexes in a relational database.   |  |  | | --- | --- | | *ANSWER:* | An index is an orderly arrangement used to logically access rows in a table. From a conceptual point of view, an index is composed of an index key and a set of pointers. The index key is, in effect, the index’s reference point. More formally, an index is an ordered arrangement of keys and pointers. Each key points to the location of the data identified by the key. DBMSs use indexes for many different purposes. An index can be used to retrieve data more efficiently. Indexes can also be used by a DBMS to retrieve data ordered by a specific attribute or attributes. For example, creating an index on a customer’s last name will allow you to retrieve the customer data alphabetically by the customer’s last name.  Also, an index key can be composed of one or more attributes. Indexes play an important role in DBMSs for the implementation of primary keys. When you define a table’s primary key, the DBMS automatically creates a unique index on the primary key column(s) you declared. | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 3-8 Indexes | | *LEARNING OBJECTIVES:* | 03.07 - Explain the purpose of indexing in a relational database | |