Chapter 3 - Review Questions

True/False

Indicate whether the statement is true or false.

____ 1. Most of the commercial software implementations of the relational algebra operators yield listings and new tables.
____ 2. The final outcome of a natural JOIN operation yields a table that does not include the unmatched row.
____ 3. The final outcome of a natural JOIN yields a table that provides only the copies of the unmatched pairs.
____ 4. Another form of JOIN, known as equijoin, links tables on the basis of an equality condition that compares specified columns of each table.
____ 5. In a relational table, each table must have an attribute or a combination of attributes that uniquely identifies each row.
____ 6. In a relational table, each table row (tuple) does not necessarily represent a single entity occurrence within the entry set.
____ 7. In a relational table, each column represents an attribute and each column has a distinctive name.
____ 8. In a relational table, each row/column intersection represents a single data value.
____ 9. In a relational table, each value in a column must conform to the same data format.
____ 10. Each column in a relational table has a specific range of values known as the attribute object.
____ 11. The order of the rows and columns in a relational table is immaterial to the DBMS.
____ 12. A column's range of permissible values is known as its domain.
____ 13. Each entity has certain characteristics known as attributes.
____ 14. A key consists of one or more attributes that determine other attributes.
____ 15. Numeric data are data on which you can perform meaningful arithmetic procedures.
____ 16. Character data can contain any character or symbol intended for mathematical manipulation.
____ 17. Date attributes contain calendar dates stored in a special format known as Julian date format.
____ 18. Logical data can have only a true or false (yes or no) condition.
____ 19. The proper use of foreign keys is crucial to exercising data redundancy control.
____ 20. An entity set is a named collection of entities that share common characteristics.
____ 21. Functional dependence can be defined most easily as the attribute A is functionally dependent on B if A determines B.
____ 22. A primary key can be defined as a superkey with redundancies.
____ 23. To maintain entity integrity, a null value is permitted in the primary key.
____ 24. To avoid null values, some designers use special codes, known as flags, to indicate the absence of some values.
25. When two or more tables share the same columns and domains, they are said to be incompatible.

26. Referential algebra defines the theoretical way of manipulating table contents using the eight relational operators.

27. A natural JOIN links tables by selecting only the rows with common values in their common attribute(s).

28. In an inner JOIN, the matched pairs would be retained and any unmatched values in the other table would be left null.

29. The data dictionary is used to provide a detailed accounting of all tables found within the user/designer-created database.

30. Outer joins are especially useful when trying to determine what values in related table(s) cause referential integrity problems.

Multiple Choice
Identify the choice that best completes the statement or answers the question.

31. Nulls, if used improperly, can create problems because they can represent ____.
   - a default value
   - a known, but missing, attribute value
   - zero
   - an unsortable value

32. The entity integrity rule requires that ____.
   - all primary key entries are unique
   - a part of the key may be null
   - foreign key values do not reference primary key values
   - duplicate object values are allowed

33. The referential integrity rule requires that ____.
   - every null foreign key value must reference an existing primary key value
   - an attribute have a corresponding value
   - every non-null foreign key value reference an existing primary key value
   - you delete a row in one table whose primary key does not have a matching foreign key value in another table

34. Data are classified, according to their format and function, into which categories?
   - Numeric and character
   - Numeric and logical
   - Numeric, character, and date
   - Numeric, character, date, and logical

35. A table is perceived as a ____.
   - flat structure
   - two-dimensional structure
   - linked structure
   - graph
36. According to E.F. Codd, another word for the term “relation” is ____.
   a. datafile
   b. data index
   c. table
   d. data query

37. The logical view of the relational database is facilitated by the ____.
   a. wizard
   b. use of tables
   c. creation of queries using the wizard
   d. creation of data relationships based on a construct known as a table

38. Each table must have a ____ key.
   a. primary
   b. secondary
   c. foreign
   d. logical

39. The key's role is based on a concept known as ____.
   a. consistency
   b. availability
   c. determination
   d. uniqueness

40. A superkey is any key that uniquely identifies each ____ uniquely.
   a. entity
   b. object in a table
   c. table
   d. structure in a table

41. A primary key ____.
   a. is a minimal superkey
   b. is always the first field in each table
   c. must be numeric
   d. must be unique

42. A table can be logically connected to another table by defining a ____.
   a. hyperlink
   b. common attribute
   c. primary key
   d. logic key

43. A relational operator that yields values from all rows in a table is known as the ____ operator.
   a. DIFFERENCE
   b. PRODUCT
   c. SELECT
   d. PROJECT

44. A relational operator that yields all values from selected attributes is known as the ____ operator.
   a. DIFFERENCE
   b. PRODUCT
   c. SELECT
   d. PROJECT
45. A relational operator that allows for the combination of information from two or more tables is known as the ____________ operator.
   a. SELECT
   b. PROJECT
   c. JOIN
   d. DIFFERENCE

46. In a relationship, when a primary key from one table is also defined in a second table, the field is referred to as a ______ in the second table.
   a. combined key
   b. redundant field
   c. primary key
   d. foreign key

47. A relational operator that yields all possible pairs of rows from two tables is known as the ______ operator.
   a. UNION
   b. INTERSECT
   c. DIFFERENCE
   d. PRODUCT

48. A primary key that consists of more than one field is called a ______ key.
   a. composite
   b. secondary
   c. group
   d. foreign

49. A relational operator that yields all rows in one table that are not found in the other table is the ______ operator.
   a. UNION
   b. INTERSECT
   c. DIFFERENCE
   d. PRODUCT

50. The short Date format is _____.
   a. DD-MM-YY
   b. DD/MM/YY
   c. MM/DD/YY
   d. MM-DD-YY

51. A field that consists of integer values is a ______ type field.
   a. Date/Time
   b. Yes/No
   c. Memo
   d. Numeric

52. Which of the following statements concerning the primary key is true?
   a. All primary key entries are unique.
   b. The primary key may be null.
   c. The primary key is not required for all tables.
   d. The primary key data do not have to be unique.
53. Which of the following is NOT an allowable operation for a date field?
   a. Compare two dates
   b. Multiply two dates
   c. Convert a date from its internal representation to a different presentation format
   d. Create a date by adding or subtracting a number of days from a given date

54. In general terms, the key is an attribute (or combination of attributes) that uniquely identifies any given entity.
   a. indexed
   b. primary
   c. foreign
   d. redundant

55. In the context of a database table, the statement “A determines B” indicates that .
   a. knowing the value of attribute A, you cannot look up the value of attribute B
   b. you do not need to know the value of attribute A in order to look up the value of attribute B
   c. knowing the value of attribute B, you can look up the value of attribute A
   d. knowing the value of attribute A, you can look up the value of attribute B

56. A is any key that identifies each entity uniquely. It functionally determines all of the entity's attributes.
   a. superkey
   b. primary key
   c. foreign key
   d. combined key

57. It might take more than a single attribute to define functional dependence; that is, a key may be composed of more than one attribute. A multi-attribute key is known as a key.
   a. primary
   b. super
   c. composite
   d. foreign

58. Within a table, the primary key must be unique so that it will identify each row. When this is the case, the table is said to exhibit integrity.
   a. referential
   b. entity
   c. enforced
   d. key

59. In a sophisticated application development software, nulls can create problems when using functions such as:
   a. COUNT
   b. SUM
   c. COUNT and AVERAGE
   d. COUNT, SUM, and AVERAGE

60. We can describe a link by observing that .
   a. a primary key of one table appears again as a primary key in a related table
   b. a foreign key of one table appears again as a foreign key in a related table
   c. a primary key of one table appears again as a foreign key in a related table
   d. a foreign key of one table appears again as a primary key in a related table
61. When designing a new database, it is a good idea to ____
   a. minimize data redundancy
   b. include redundant fields
   c. include a common field in all tables
   d. use composite keys

62. If a foreign key contains either matching values or nulls, the table(s) that make use of such a foreign key is/are said to exhibit ____ integrity.
   a. referential
   b. restrictive
   c. secondary
   d. redundant

63. A ____ key is defined as a key that is used strictly for data retrieval purposes.
   a. primary
   b. foreign
   c. secondary
   d. data

64. A ____ key's effectiveness in narrowing down a search depends on how restrictive it is.
   a. primary
   b. foreign
   c. secondary
   d. search

65. A superkey that does not contain a subset of attributes that is itself a superkey is called a ____.
   a. candidate key
   b. primary key
   c. superkey
   d. secondary key

66. An attribute (or combination of attributes) that uniquely identifies each entity in a table is called a ____.
   a. superkey
   b. candidate key
   c. primary key
   d. secondary key

67. A candidate key selected to uniquely identify all other attribute values in any given row, and cannot have a null value, is called a ____.
   a. superkey
   b. candidate key
   c. primary key
   d. secondary key

68. An attribute (or combination of attributes) used strictly for data retrieval purposes is called a ____.
   a. superkey
   b. candidate key
   c. primary key
   d. secondary key
69. An attribute (or combination of attributes) in one table whose values must either match the primary key in another table or be null is called a ____ key.
   a. foreign
   b. candidate
   c. primary
   d. secondary

70. A null value is created or represented by ____.
   a. a zero
   b. a space
   c. entering a value
   d. pressing the Enter key without making a prior entry of any kind

71. The link between two tables can be described by observing that it is created when ____.
   a. two tables share an attribute with common values
   b. two tables share different attributes
   c. a primary key of one table appears as a foreign key in a related table
   d. all of the above

72. A key that consists of more than one field is called a ____.
   a. foreign key
   b. composite key
   c. redundant key
   d. superkey

73. On a customer table, data retrieval for a specific customer can be facilitated when a customer's number, last name, and phone number are used where ____.
   a. customer's last name is primary key
   b. customer's number is the primary key
   c. the secondary key is a combination of customer's last name and phone number
   d. all of the above

74. Records in a table are displayed in ____ key sequence.
   a. primary
   b. foreign
   c. composite
   d. redundant

75. To be considered minimally relational, the DBMS must support the key relational operator(s) ____.
   a. join
   b. select, project, and join
   c. select and project
   d. select

76. A relational operator that combines all rows from two tables is considered to be a(n) ____.
   a. UNION
   b. INTERSECT
   c. DIFFERENCE
   d. PRODUCT
77. A field, or a combination of fields, that has a unique value is a ____.
   a. foreign key
   b. primary key
   c. relation
   d. table

78. A primary key ____.
   a. consists of only one field
   b. has the same value for all records
   c. must contain a unique value for each record within the table
   d. is defined automatically

79. A foreign key must ____.
   a. be numeric
   b. be unique
   c. be defined in all tables within the database
   d. match the field value of a primary key in a related table

Completion

Complete each statement.

80. The __________________ view of a relational database is facilitated by the creation of data relationships based on a construct known as a table.

81. Another name for a table row is a(n) __________________.

82. A(n) __________________ is perceived as a two-dimensional structure composed of rows and columns.

83. A(n) __________________ consists of one or more attributes that determine other attributes.

84. The key's role is based on a concept known as __________________.

85. Another form of JOIN, known as __________________, links tables on the basis of an equality condition that compares columns of each table.

86. The final outcome of a natural __________________ yields a table that does not include unmatched pairs.

87. The order of the rows and columns in a(n) __________________ table is immaterial to the DBMS.

88. In a relational table, each row/column __________________ represents a single data value.

89. In a relational table, each table row (tuple) necessarily represents a single __________________ occurrence within the entry set.

90. In a relational table, each table must have an attribute or a combination of __________________ that uniquely identifies each row.

91. Each table column represents a(n) __________________ and has a distinct name.

92. The __________________ key is an attribute that uniquely identifies any given entity.

93. A __________________ is perceived as a two-dimensional structure composed of rows and columns.

94. Numeric data are data on which you can perform meaningful __________________ procedures.
95. Character data can contain any character or symbol not intended for ________________ manipulation.

96. Date attributes contain calendar dates stored in a special format known as ________________ date format.

97. A table that links two tables together is called a(n) ________________ table.

98. The system ________________ can be described as a detailed system data dictionary that describes all objects within the database.

99. A(n) ________________ JOIN links tables on the basis of the less than comparison operator.

100. A(n) ________________ JOIN links tables by selecting only the rows and columns with common values in their common attributes.

Essay

101. What does the relational database model do?

102. How is the RDBMS organized?

103. What is a table?