Chapter 4 - Review Questions

True/False

Indicate whether the statement is true or false.

_____ 1. Database designers must obtain a precise description of the nature of the data and the many uses of such data within an organization.

_____ 2. The ER model is used to expand the different views of the data at the conceptual level.

_____ 3. The Chen model is especially useful to illustrate some of the conceptual elements of database design.

_____ 4. The Crow’s Foot model is less implementation-oriented than the Chen model.

_____ 5. A composite key is a primary key composed of more than one attribute.

_____ 6. The ER diagram represents the conceptual database as viewed by the end user.

_____ 7. The word “entity” in the ER model corresponds to a table.

_____ 8. The ER model refers to a specific table row as an entity instance.

_____ 9. The ER model refers to a specific table row as an entity occurrence.

_____ 10. Cardinality expresses the specific number of entity occurrences associated with one occurrence of the related entity.

_____ 11. Attributes do not have a domain.

_____ 12. Attributes may not share a domain.

_____ 13. Cardinality expresses the specific number of entity occurrences associated with every occurrence of a related entity.

_____ 14. In both the Chen and Crow’s Foot models, an entity is represented with a rectangle containing the entity’s name.

_____ 15. Attributes are types of entities.

_____ 16. In the Chen model, each attribute is represented using an oval with the attribute name connected to the entity with a line.

_____ 17. In an ER diagram, primary keys are usually bolded.

_____ 18. Ideally, a primary key is composed of several attributes.

_____ 19. All attributes are either simple or composite.

_____ 20. All simple attributes are also single-valued.

_____ 21. In the Chen model, a multivalued attribute is connected to the owning entity with a double line.

_____ 22. The DBMS can easily handle multivalued attributes.

_____ 23. Derived attributes are stored in a special database table.

_____ 24. In Chen notation, there is no way to represent cardinality.
25. Connectivities and cardinalities are established by business rules.

26. All entity relationships can be characterized as weak or strong.

27. You should always load data from the 1 side of a 1:M relationship.

28. The existence of a mandatory relationship indicates that the minimum cardinality is 1 for the mandatory entity.

29. Relationship participation is not very important when designing a database.

30. A weak entity has a primary key that is partially or totally derived from the parent entity in the relationship.

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

31. The ERD is used to graphically represent the ____ database model.
   a. condensed
   b. physical
   c. logical
   d. conceptual

32. The Chen model is especially useful to illustrate the database from a(n) ____ perspective.
   a. developmental
   b. conceptual
   c. actual
   d. specific

33. Successful database design is, first and foremost, based on ____ requirements.
   a. designer
   b. programmer
   c. end-user
   d. business

34. Some attributes are classified as ____.
   a. simple
   b. complex
   c. defined
   d. grouped

35. A derived attribute ____.
   a. must be stored physically within the database
   b. need not be physically stored within the database
   c. has many values
   d. must be based on the value of three or more attributes

36. A relationship is an association between ____.
   a. objects
   b. entities
   c. databases
   d. fields
37. Cardinality expresses ____ number of entity occurrences associated with one occurrence of the related entity.
   a. an undetermined
   b. the specific
   c. a pre-determined
   d. a programmed

38. Knowing the ____ number of entity occurrences is very helpful at the application software level.
   a. maximum
   b. minimum
   c. exact
   d. maximum and minimum

39. The ____ model is the end user's view of the data environment.
   a. internal
   b. external
   c. physical
   d. conceptual

40. A ____ key is a key that consists of more than one attribute.
   a. primary
   b. foreign
   c. composite
   d. domain

41. A ____ attribute can be further subdivided to yield additional attributes.
   a. composite
   b. simple
   c. single-valued
   d. multivalued

42. A ____ attribute is one that cannot be subdivided.
   a. composite
   b. simple
   c. single-valued
   d. multivalued

43. A ____ attribute can have only one value.
   a. composite
   b. simple
   c. single-valued
   d. multivalued

44. ____ attributes can have several values.
   a. Composite
   b. Simple
   c. Single-valued
   d. Multivalued

45. A ____ attribute need not be physically stored within the database.
   a. composite
   b. multivalued
   c. single-valued
   d. derived
46. If an entity’s existence depends on the existence of one or more other entities, it is said to be ____-dependent.
   a. existence
   b. relationship
   c. business
   d. weak

47. If an entity can exist apart from one or more related entities, it is said to be ____-independent.
   a. existence
   b. relationship
   c. business
   d. weak

48. A ____ entity has a primary key that is partially derived from the parent entity in the relationship.
   a. strong
   b. weak
   c. business
   d. relationship

49. A ____ relationship exists when an association is maintained within a single entity.
   a. unary
   b. ternary
   c. binary
   d. weak

50. A ____ relationship exists when two entities are associated.
   a. unary
   b. binary
   c. ternary
   d. weak

51. A ____ relationship exists when three entities are associated.
   a. unary
   b. binary
   c. ternary
   d. weak

52. A ____ entity is composed of the primary keys of each of the entities to be connected.
   a. bridge
   b. composite
   c. unary
   d. binary

53. The bridge entity is known as a ____ entity.
   a. unary
   b. weak
   c. strong
   d. composite

54. Attributes may share a:
   a. name
   b. domain
   c. location
   d. table
55. The set of possible values for an attribute is a ____.
   a. domain
   b. range
   c. set
   d. key

56. In an ER diagram, primary keys are indicated by ____.
   a. bolding
   b. italics
   c. underlining
   d. a special font

57. What is the ideal number of attributes used to make up a primary key?
   a. 0
   b. 1
   c. 2
   d. 6

58. Which attribute(s) make up the primary key in the table definition:
   CLASS (CRS_CODE, CLASS_SECTION, CLASS_TIME, CLASS_ROOM, PROF_NUM)
   a. CRS_CODE
   b. CLASS_SECTION
   c. CRS_CODE and CLASS_SECTION
   d. There is no primary key

59. Which of the following might be represented with a multivalued attribute?
   a. Person’s name
   b. Class location
   c. Bank account balance
   d. Book title

60. Which of the following might be represented with a single-valued attribute?
   a. Person’s phone number(s)
   b. Car’s color
   c. Employee’s educational background
   d. Computer’s processor speed

61. What type of attribute cannot be created in a DBMS?
   a. derived
   b. multivalued
   c. simple
   d. composite

62. Which of the following should be a derived attribute?
   a. Person’s name
   b. Person’s age
   c. Person’s social security number
   d. Person’s phone number

63. How is a derived attribute indicated in the Chen model?
   a. Single line
   b. Dashed line
   c. Circle
   d. Double line
64. A relationship name should be a(n) ____.
   a. verb
   b. noun
   c. adjective
   d. number

65. In the Chen model, cardinality is indicated using the ____ notation.
   a. (max, min)
   b. (min, max)
   c. [min ... max]
   d. {min|max}

66. Making sure all ____ are identified is the most important part of a database designer’s job.
   a. business rules
   b. cardinalities
   c. derived attributes
   d. relationships

67. Another word for existence-independent is ____.
   a. weak
   b. alone
   c. unary
   d. strong

68. When the PK of one entity does not contain the PK of a related entity, the relationship is ____.
   a. missing
   b. weak
   c. strong
   d. neutral

69. The term “____” is used to label any condition in which one or more optional relationships exist.
   a. participation
   b. optionality
   c. cardinality
   d. connectivity

70. Which ER model was developed first?
   a. Crow’s Foot
   b. Rein85
   c. Chen
   d. IDEF1X

Completion

Complete each statement.

71. The Chen model is specially useful to illustrate some of the _________________ elements of database design.

72. The Crow’s Foot model is more _________________-oriented than the Chen model.

73. Successful database design is, first and foremost, based on _________________ requirements.

74. The most widely used conceptual model is the _________________ relationship model.
75. One of the conceptual model advantages is that it provides a relatively easily understood, bird’s-eye view of the data.

76. A(n) attribute need not be physically stored within the database.

77. A person’s social security number would be an example of a(n) attribute.

78. Knowing the minimum and maximum number of entity occurrences is very useful at the application software level.

79. expresses the specific number of entity occurrences associated with one occurrence of the related entity.

80. The refers to a specific table row as an entity instance.

81. attributes can be subdivided.

82. A(n) is the attribute’s set of possible values.

83. are characteristics of entities.

84. are underlined in an ER diagram.

85. A(n) attribute cannot be subdivided.

86. An attribute representing one or more college degrees belonging to a person would be a(n) attribute.

87. Instead of storing a person’s age, it is better to store the date of birth and use the difference between that value and the system date as a(n) attribute.

88. expresses the specific number of entity occurrences associated with one occurrence of the related entity.

89. In the relationship “EMPLOYEE claims DEPENDENT” the DEPENDENT entity is on the EMPLOYEE entity.

90. A(n) relationship is also known as an identifying relationship.

91. Participation is if one entity occurrence does not require a corresponding entity occurrence in a particular relationship.

92. Relationship strength depends on how the primary key of the related entity is formulated, while the relationship depends on how the business rule is written.

93. A weak entity must be -dependent.

94. A(n) relationship exists when two entities are associated.

95. Connectivities and cardinalities are usually based on rules.

Essay

96. Explain the difference between simple and composite attributes. Provide at least one example of each.
97. Explain single-valued attributes and provide an example. Is an attribute that is single-valued always simple? Why or why not? Use an example to illustrate your point.

98. Explain multivalued attributes, and provide an example. How are multivalued attributes indicated in the Chen model? How are they indicated in the Crow’s Foot model?