### Multiple Choice Questions

1. Which of the following is not associated with database design?
   - a. Structure the data in stable structures that are not likely to change over time and that have minimal redundancy.
   - b. The preparation of a final conceptual model and the implementation of the database.
   - c. Develop a logical database design from which we can do physical database design.
   - d. Develop a logical database design that reflects the actual data requirements that exist in the forms and reports of an information system.

2. The most common style for a logical database model is the:
   - a. relational database model
   - b. hierarchical database model
   - c. network database model
   - d. object-oriented database model

3. During logical database design, the work of all systems development team members is coordinated and shared through:
   - a. the project dictionary
   - b. scheduled weekly meetings
   - c. the project leader
   - d. JAD sessions

4. Combining all normalized user views into one consolidated logical database model refers to:
   - a. requirements structuring
   - b. view integration
   - c. normalization
   - d. file integration

5. During physical design, you consider:
   - a. the definitions of each attribute
   - b. the descriptions of where and when data are entered, retrieved, deleted, and updated
   - c. the expectations for response time and data integrity
   - d. all of the above

6. The following are steps to transforming an E-R diagram into normalized relations and then merging all the relations into one final, consolidated set of relations except for:
   - a. represent entities
   - b. represent relationships
   - c. normalize the relations
   - d. denormalize the relations

7. Using relational notation, an attribute of a relation that is the primary key of another relation is indicated by:
   - a. an underline
   - b. a circle
   - c. a dashed underline
   - d. italics
8. The primary deliverable from logical database design is:
   a. normalized relations
   b. design specifications
   c. an updated baseline project plan
   d. a list of alternative design strategies

9. A data model that represents data in the form of tables or relations is called a:
   a. hierarchical database model
   b. network database model
   c. relational database model
   d. hybrid database model

10. The process of converting complex data structures into simple, stable data structures is referred to as:
    a. normalization
    b. simplification
    c. structuring
    d. process modeling

11. When each nonprimary key attribute is identified by the whole key, the relation is said to be in at least:
    a. second normal form
    b. third normal form
    c. fourth normal form
    d. fifth normal form

12. A particular relationship between two attributes best defines:
    a. context
    b. functional dependency
    c. normal form
    d. structure

13. A functional dependency between two (or more) nonprimary key attributes in a relation defines a:
    a. weak dependency
    b. partial dependency
    c. simple dependency
    d. transitive dependency

14. If order number serves as the primary key in the ORDER relation and also appears as a nonprimary key attribute in the INVOICE relation, then order number is said to be a:
    a. foreign key
    b. candidate key
    c. pointer
    d. relationship key

15. Which of the following properties should be satisfied when the identifier of the entity type becomes the primary key of the corresponding relation?
    a. The value of the key must uniquely identify every row in the relation.
    b. The key should serve as a foreign key in at least two other relations.
    c. The key must be a composite of a primary key and a secondary key.
    d. The key should be an intelligent key.
16. An entity whose primary key depends on the primary key of another entity is called a:
   a. referential entity
   b. candidate entity
   c. transitive entity
   d. weak entity

17. A binary one-to-many relationship in an E-R diagram is best represented by:
   a. the creation of a separate relation; the primary key of this new relation is a composite key consisting of the
      primary key for each of the two entities in the relationship
   b. adding the primary key attribute (or attributes) of the entity on the one side of the relationship as a foreign
      key in the relation that is on the many side of the relationship
   c. adding the primary key attribute (or attributes) of the entity on the many side of the relationship as a foreign
      key in the relation that is on the one side of the relationship
   d. creating a relation with a composite primary key and nonkey attributes

18. For a unary one-to-one relationship between two entities A and B, the relationship is represented by:
   a. adding the primary key of A as a foreign key of B
   b. adding the primary key of B as a foreign key of A
   c. combining the two entities into one relation
   d. either a or b

19. For a unary M:N relationship:
   a. the entity type is modeled as one relation; using as its primary key a composite key, a separate relation is
      created to represent the M:N relationship
   b. the entity type and the M:N relationship are modeled as one relation; a composite key is used
   c. separate relations for the class and for each subclass are created; primary and foreign keys are established
      for each class
   d. the primary key of the entity on the one side of the relationship serves as a foreign key in the relation on the
      many side of the relationship

20. “Create a relation with primary key and nonkey attributes” is the relational representation for which E-R
    structure?
    a. weak entity
    b. regular entity
    c. gerund
    d. IS-A relationship

21. A single name that is used for two or more different attributes best defines:
    a. homonym
    b. synonym
    c. transitive dependency
    d. alias

22. When two 3NF relations are merged to form a single relation:
    a. weak entities are created
    b. recursive relationships may result
    c. transitive dependencies may result
    d. IS-A relationships are formed
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>23.</strong></td>
<td>A special field value, distinct from 0, blank, or any other value, that indicates that the value for the field is missing or otherwise unknown best defines:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. transitive value</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. primary key</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. null value</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. pointer</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>24.</strong></td>
<td>Which of the following combines range and hash partitioning by first segregating data by ranges on the designated attribute and then within each of these partitions it further partitions by hashing on the designated attribute?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. composite partitioning</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td>b. combined partitioning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. transitive partitioning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. functional partitioning</td>
<td></td>
<td></td>
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<tr>
<td><strong>25.</strong></td>
<td>A field of data that can be used to locate a related field or row of data best describes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. pointer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. marker</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. field locator</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. reference locator</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Chapter 10

#### Designing Databases

**Answers**

1. Which of the following is not associated with database design?
   - a. Structure the data in stable structures that are not likely to change over time and that have minimal redundancy.
   - b. The preparation of a final conceptual model and the implementation of the database.
   - c. Develop a logical database design from which we can do physical database design.
   - d. Develop a logical database design that reflects the actual data requirements that exist in the forms and reports of an information system.

   **Answer:** b  
   **Difficulty:** Hard  
   **Reference:** pp. 345

2. The most common style for a logical database model is the:
   - a. relational database model
   - b. hierarchical database model
   - c. network database model
   - d. object-oriented database model

   **Answer:** a  
   **Difficulty:** Med  
   **Reference:** p. 351

3. During logical database design, the work of all systems development team members is coordinated and shared through:
   - a. the project dictionary
   - b. scheduled weekly meetings
   - c. the project leader
   - d. JAD sessions

   **Answer:** a  
   **Difficulty:** Easy  
   **Reference:** p. 346

4. Combining all normalized user views into one consolidated logical database model refers to:
   - a. requirements structuring
   - b. view integration
   - c. normalization
   - d. file integration

   **Answer:** b  
   **Difficulty:** Med  
   **Reference:** p. 347

5. During physical design, you consider:
   - a. the definitions of each attribute
   - b. the descriptions of where and when data are entered, retrieved, deleted, and updated
   - c. the expectations for response time and data integrity
   - d. all of the above

   **Answer:** d  
   **Difficulty:** Med  
   **Reference:** p. 366

6. The following are steps to transforming an E-R diagram into normalized relations and then merging all the relations into one final, consolidated set of relations except for:
   - a. represent entities
   - b. represent relationships
   - c. normalize the relations
   - d. denormalize the relations

   **Answer:** d  
   **Difficulty:** Med  
   **Reference:** p. 356
<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
<th>Answer</th>
<th>Difficulty</th>
<th>Reference</th>
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</thead>
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<tr>
<td>7.</td>
<td>Using relational notation, an attribute of a relation that is the primary key of another relation is indicated by:</td>
<td>c</td>
<td>Med</td>
<td>p. 358</td>
</tr>
<tr>
<td></td>
<td>a. an underline</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>b. a circle</td>
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<td></td>
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<tr>
<td></td>
<td>c. a dashed underline</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>d. italics</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8.</td>
<td>The primary deliverable from logical database design is:</td>
<td>a</td>
<td>Med</td>
<td>p. 347</td>
</tr>
<tr>
<td></td>
<td>a. normalized relations</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>b. design specifications</td>
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<td></td>
<td>c. an updated baseline project plan</td>
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<tr>
<td></td>
<td>d. a list of alternative design strategies</td>
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<tr>
<td>9.</td>
<td>A data model that represents data in the form of tables or relations is called a:</td>
<td>c</td>
<td>Med</td>
<td>p. 351</td>
</tr>
<tr>
<td></td>
<td>a. hierarchical database model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. network database model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. relational database model</td>
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<tr>
<td></td>
<td>d. hybrid database model</td>
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<tr>
<td>10.</td>
<td>The process of converting complex data structures into simple, stable data structures is referred to as:</td>
<td>a</td>
<td>Med</td>
<td>p. 352</td>
</tr>
<tr>
<td></td>
<td>a. normalization</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>b. simplification</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>c. structuring</td>
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</tr>
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<td></td>
<td>d. process modeling</td>
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<tr>
<td>11.</td>
<td>When each nonprimary key attribute is identified by the whole key, the relation is said to be in at least:</td>
<td>a</td>
<td>Hard</td>
<td>p. 354</td>
</tr>
<tr>
<td></td>
<td>a. second normal form</td>
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<tr>
<td></td>
<td>b. third normal form</td>
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<td></td>
<td>c. fourth normal form</td>
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<td></td>
<td>d. fifth normal form</td>
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<tr>
<td></td>
<td>a. context</td>
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<td></td>
<td>b. functional dependency</td>
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<tr>
<td></td>
<td>c. normal form</td>
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<td></td>
<td>d. structure</td>
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<td>13.</td>
<td>A functional dependency between two (or more) nonprimary key attributes in a relation defines a:</td>
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<td>------------------------------------------------------------------------------------------------</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>weak dependency</td>
<td></td>
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<tr>
<td>b.</td>
<td>partial dependency</td>
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<tr>
<td>c.</td>
<td>simple dependency</td>
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<td></td>
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<tr>
<td>d.</td>
<td>transitive dependency</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Answer:</strong> d</td>
<td><strong>Difficulty:</strong> Hard</td>
<td><strong>Reference:</strong> p. 354</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>14.</th>
<th>If order number serves as the primary key in the ORDER relation and also appears as a nonprimary key attribute in the INVOICE relation, then order number is said to be a:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>foreign key</td>
</tr>
<tr>
<td>b.</td>
<td>candidate key</td>
</tr>
<tr>
<td>c.</td>
<td>pointer</td>
</tr>
<tr>
<td>d.</td>
<td>relationship key</td>
</tr>
<tr>
<td><strong>Answer:</strong> a</td>
<td><strong>Difficulty:</strong> Med</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15.</th>
<th>Which of the following properties should be satisfied when the identifier of the entity type becomes the primary key of the corresponding relation?</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>The value of the key must uniquely identify every row in the relation.</td>
</tr>
<tr>
<td>b.</td>
<td>The key should serve as a foreign key in at least two other relations.</td>
</tr>
<tr>
<td>c.</td>
<td>The key must be a composite of a primary key and a secondary key.</td>
</tr>
<tr>
<td>d.</td>
<td>The key should be an intelligent key.</td>
</tr>
<tr>
<td><strong>Answer:</strong> a</td>
<td><strong>Difficulty:</strong> Med</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>16.</th>
<th>An entity whose primary key depends on the primary key of another entity is called a:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>referential entity</td>
</tr>
<tr>
<td>b.</td>
<td>candidate entity</td>
</tr>
<tr>
<td>c.</td>
<td>transitive entity</td>
</tr>
<tr>
<td>d.</td>
<td>weak entity</td>
</tr>
<tr>
<td><strong>Answer:</strong> d</td>
<td><strong>Difficulty:</strong> Med</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>17.</th>
<th>A binary one-to-many relationship in an E-R diagram is best represented by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>the creation of a separate relation; the primary key of this new relation is a composite key consisting of the primary key for each of the two entities in the relationship</td>
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<td>b.</td>
<td>adding the primary key attribute (or attributes) of the entity on the one side of the relationship as a foreign key in the relation that is on the many side of the relationship</td>
</tr>
<tr>
<td>c.</td>
<td>adding the primary key attribute (or attributes) of the entity on the many side of the relationship as a foreign key in the relation that is on the one side of the relationship</td>
</tr>
<tr>
<td>d.</td>
<td>creating a relation with a composite primary key and nonkey attributes</td>
</tr>
<tr>
<td><strong>Answer:</strong> b</td>
<td><strong>Difficulty:</strong> Hard</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>18.</th>
<th>For a unary one-to-one relationship between two entities A and B, the relationship is represented by:</th>
</tr>
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</tr>
<tr>
<td>b.</td>
<td>adding the primary key of B as a foreign key of A</td>
</tr>
<tr>
<td>c.</td>
<td>combining the two entities into one relation</td>
</tr>
<tr>
<td>d.</td>
<td>either a or b</td>
</tr>
<tr>
<td><strong>Answer:</strong> d</td>
<td><strong>Difficulty:</strong> Hard</td>
</tr>
</tbody>
</table>
### Question 19
For a unary M:N relationship:

- a. the entity type is modeled as one relation; using as its primary key a composite key, a separate relation is created to represent the M:N relationship
- b. the entity type and the M:N relationship are modeled as one relation; a composite key is used
- c. separate relations for the class and for each subclass are created; primary and foreign keys are established for each class
- d. the primary key of the entity on the one side of the relationship serves as a foreign key in the relation on the many side of the relationship

**Answer:** a  
**Difficulty:** Hard  
**Reference:** p. 360

### Question 20
"Create a relation with primary key and nonkey attributes" is the relational representation for which E-R structure?

- a. weak entity
- b. regular entity
- c. gerund
- d. IS-A relationship

**Answer:** b  
**Difficulty:** Med  
**Reference:** p. 361

### Question 21
A single name that is used for two or more different attributes best defines:

- a. homonym
- b. synonym
- c. transitive dependency
- d. alias

**Answer:** a  
**Difficulty:** Med  
**Reference:** p. 362

### Question 22
When two 3NF relations are merged to form a single relation:

- a. weak entities are created
- b. recursive relationships may result
- c. transitive dependencies may result
- d. IS-A relationships are formed

**Answer:** c  
**Difficulty:** Med  
**Reference:** p. 362

### Question 23
A special field value, distinct from 0, blank, or any other value, that indicates that the value for the field is missing or otherwise unknown best defines:

- a. transitive value
- b. primary key
- c. null value
- d. pointer

**Answer:** c  
**Difficulty:** Med  
**Reference:** p. 369

### Question 24
Which of the following combines range and hash partitioning by first segregating data by ranges on the designated attribute and then within each of these partitions it further partitions by hashing on the designated attribute?

- a. composite partitioning
- b. combined partitioning
- c. transitive partitioning
- d. functional partitioning

**Answer:** a  
**Difficulty:** Hard  
**Reference:** p. 371
25. A field of data that can be used to locate a related field or row of data best describes:

   a. pointer
   b. marker
   c. field locator
   d. reference locator

**Answer:** a  **Difficulty:** Med  **Reference:** p. 373