### Chapter 9
#### Structuring System Data Requirements

**Multiple Choice Questions**

1. Some systems developers believe that a data model is the most important part of the statement of information system requirements because:
   - a. the characteristics of data captured during data modeling are crucial in the design of databases, programs, computer screens, and printed reports
   - b. data rather than processes are the most complex aspects of many modern information systems and thus require a central role in structuring system requirements
   - c. the characteristics about data are reasonably permanent
   - d. all of the above

2. Which of the following is a true statement?
   - a. Data characteristics are dynamic.
   - b. A data model explains the transient form of an organization.
   - c. An information system design based on a data orientation, rather than a process or logic orientation, should have a longer useful life.
   - d. Data flow paths are permanent.

3. The most common format used for data modeling is:
   - a. state-transition diagramming
   - b. entity-relationship diagramming
   - c. process modeling
   - d. decision table diagramming

4. Conceptual data modeling is typically done in parallel with other requirements analysis and structuring steps during:
   - a. logical design
   - b. physical design
   - c. analysis
   - d. implementation

5. An E-R model with attributes is prepared during:
   - a. design
   - b. project identification and selection
   - c. analysis
   - d. project initiation and planning

6. The data modeling perspective that derives the business rules for a data model from an intimate understanding of the nature of the business, rather than from any specific information requirements in screens, reports, or business forms, is referred to as the:
   - a. top-down approach
   - b. bottom-up approach
   - c. overview approach
   - d. business approach
7. The three main constructs of the entity-relationship modeling notation include each of the following except:
   a. data entities
   b. data flows
   c. relationships
   d. attributes

8. A person, place, object, event, or concept in the user environment about which the organization wishes to maintain data refers to an:
   a. attribute
   b. data element
   c. relationship
   d. entity

9. A single occurrence of an entity type defines:
   a. entity instance
   b. entity appearance
   c. attribute
   d. data element

10. A named property or characteristic of an entity that is of interest to the organization defines:
    a. attribute
    b. relationship
    c. instance
    d. gerund

11. An attribute (or combination of attributes) that uniquely identifies each instance of an entity type defines:
    a. data element occurrence
    b. trigger
    c. candidate key
    d. gerund

12. For each entity, the name of the identifier is:
    a. identified by using a double-lined ellipse
    b. underlined on an E-R diagram
    c. bold on an E-R diagram
    d. written in all capital letters on an E-R diagram

13. A set of two or more multivalued attributes that are logically related defines:
    a. relationship
    b. gerund
    c. repeating group
    d. class

14. An association between the instances of one or more entity types that is of interest to the organization best defines:
    a. occurrence
    b. relationship
    c. coupling
    d. cardinality
15. If STUDENT and COURSE participate in a relationship, their relationship is a(n):
   a. unary relationship
   b. binary relationship
   c. ternary relationship
   d. extraordinary relationship

16. The number of instances of entity B that can (or must) be associated with each instance of entity A refers to:
   a. cardinality
   b. domain
   c. ternary occurrence
   d. participation level

17. A relationship that the data modeler chooses to model as an entity type best defines:
   a. recursive relationship
   b. associative entity
   c. domain
   d. complex relationship

18. A subgrouping of the entities in an entity type that is meaningful to the organization and that shares common attributes or relationships distinct from other subgroupings best defines:
   a. child node
   b. disjoined entity
   c. subtype
   d. supertype

19. Which of the following specifies that an entity instance can simultaneously be a member of two (or more) subtypes?
   a. total specialization rule
   b. partial specialization rule
   c. disjoint rule
   d. overlap rule

20. The data manipulation operation (insert, delete, or update) that initiates the operation is called a(n):
   a. condition
   b. action
   c. user rule
   d. event
### Answers

1. Some systems developers believe that a data model is the most important part of the statement of information system requirements because:
   - a. the characteristics of data captured during data modeling are crucial in the design of databases, programs, computer screens, and printed reports
   - b. data rather than processes are the most complex aspects of many modern information systems and thus require a central role in structuring system requirements
   - c. the characteristics about data are reasonably permanent
   - d. all of the above
   **Answer:** d  **Difficulty:** Med  **Reference:** p. 283

2. Which of the following is a true statement?
   - a. Data characteristics are dynamic.
   - b. A data model explains the transient form of an organization.
   - c. An information system design based on a data orientation, rather than a process or logic orientation, should have a longer useful life.
   - d. Data flow paths are permanent.
   **Answer:** c  **Difficulty:** Med  **Reference:** p. 284

3. The most common format used for data modeling is:
   - a. state-transition diagramming
   - b. entity-relationship diagramming
   - c. process modeling
   - d. decision table diagramming
   **Answer:** b  **Difficulty:** Med  **Reference:** p. 286

4. Conceptual data modeling is typically done in parallel with other requirements analysis and structuring steps during:
   - a. logical design
   - b. physical design
   - c. analysis
   - d. implementation
   **Answer:** c  **Difficulty:** Med  **Reference:** p. 285

5. An E-R model with attributes is prepared during:
   - a. design
   - b. project identification and selection
   - c. analysis
   - d. project initiation and planning
   **Answer:** c  **Difficulty:** Med  **Reference:** p. 287
### 6. The data modeling perspective that derives the business rules for a data model from an intimate understanding of the nature of the business, rather than from any specific information requirements in screens, reports, or business forms, is referred to as the:

- a. top-down approach
- b. bottom-up approach
- c. overview approach
- d. business approach

**Answer:** a  
**Difficulty:** Med  
**Reference:** p. 288

### 7. The three main constructs of the entity-relationship modeling notation include each of the following except:

- a. data entities
- b. data flows
- c. relationships
- d. attributes

**Answer:** b  
**Difficulty:** Med  
**Reference:** p. 290

### 8. A person, place, object, event, or concept in the user environment about which the organization wishes to maintain data refers to a(n):

- a. attribute
- b. data element
- c. relationship
- d. entity

**Answer:** d  
**Difficulty:** Med  
**Reference:** p. 290

### 9. A single occurrence of an entity type defines:

- a. entity instance
- b. entity appearance
- c. attribute
- d. data element

**Answer:** a  
**Difficulty:** Med  
**Reference:** p. 291

### 10. A named property or characteristic of an entity that is of interest to the organization defines:

- a. attribute
- b. relationship
- c. instance
- d. gerund

**Answer:** a  
**Difficulty:** Med  
**Reference:** p. 293

### 11. An attribute (or combination of attributes) that uniquely identifies each instance of an entity type defines:

- a. data element occurrence
- b. trigger
- c. candidate key
- d. gerund

**Answer:** c  
**Difficulty:** Med  
**Reference:** p. 294
<table>
<thead>
<tr>
<th>Question</th>
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| 12. | For each entity, the name of the identifier is: | a. identified by using a double-lined ellipse  
b. underlined on an E-R diagram  
c. bold on an E-R diagram  
d. written in all capital letters on an E-R diagram | b | Med | p. 294 |
| 13. | A set of two or more multivalued attributes that are logically related defines: | a. relationship  
b. gerund  
c. repeating group  
d. class | c | Med | p. 295 |
| 14. | An association between the instances of one or more entity types that is of interest to the organization best defines: | a. occurrence  
b. relationship  
c. coupling  
d. cardinality | b | Med | p. 296 |
| 15. | If STUDENT and COURSE participate in a relationship, their relationship is a(n): | a. unary relationship  
b. binary relationship  
c. ternary relationship  
d. extraordinary relationship | b | Med | p. 299 |
| 16. | The number of instances of entity B that can (or must) be associated with each instance of entity A refers to: | a. cardinality  
b. domain  
c. ternary occurrence  
d. participation level | a | Med | p. 300 |
| 17. | A relationship that the data modeler chooses to model as an entity type best defines: | a. recursive relationship  
b. associative entity  
c. domain  
d. complex relationship | b | Med | p. 302 |
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<td>d. supertype</td>
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<td><strong>Answer:</strong> c</td>
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| 19. Which of the following specifies that an entity instance can simultaneously be a member of two (or more) subtypes? |
| a. total specialization rule |
| b. partial specialization rule |
| c. disjoint rule |
| d. overlap rule |
| **Answer:** d  | **Difficulty:** Med  | **Reference:** p. 306 |

| 20. The data manipulation operation (insert, delete, or update) that initiates the operation is called a(n): |
| a. condition |
| b. action |
| c. user rule |
| d. event |
| **Answer:** d  | **Difficulty:** Hard  | **Reference:** p. 309 |