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| True / False |

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| 1. The entity relationship model (ERM) is dependent on the database type.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1 The Entity Relationship Model | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 2. The Crow’s Foot notation is less implementation-oriented than the Chen notation.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1 The Entity Relationship Model | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 3. An entity in the entity relationship model corresponds to a table in the relational environment.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1a Entities | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 4. In the entity relationship model, a table row corresponds to an entity instance.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1a Entities | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 5. In the Chen and Crow’s Foot notations, an entity is represented with a rectangle containing the entity’s name.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1a Entities | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 6. In the original Chen notation, each attribute is represented by an oval with the attribute name connected to an entity rectangle with a line.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 7. Software vendors have adopted the Chen representation because of its compact representation.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 8. A composite identifier is a primary key composed of more than one attribute.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 9. The Crow's Foot notation easily identifies multivalued attributes.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 10. Composite attributes make it easier to facilitate detailed queries.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 11. Connectivities and cardinalities are established by concise statements known as business rules.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1d Connectivity and Cardinality | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 12. In Chen notation, there is no way to represent cardinality.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1d Connectivity and Cardinality | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 13. In implementation terms, an entity is existence-dependent if it has a mandatory primary key.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1e Existence Dependence | | *LEARNING OBJECTIVES:* | 04.03 - See how ERD components affect database design and implementation | |

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| 14. A weak relationship exists if the primary key of the related entity contains at least one primary key component of the parent entity.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1f Relationship Strength | | *LEARNING OBJECTIVES:* | 04.03 - See how ERD components affect database design and implementation | |

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| 15. A weak entity has a primary key that is partially or totally derived from the parent entity in the relationship.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1g Weak Entities | | *LEARNING OBJECTIVES:* | 04.03 - See how ERD components affect database design and implementation | |

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| 16. In a 1:M relationship, to avoid the possibility of referential integrity errors, the data of the "1" side must be loaded first.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1f Relationship Strength | | *LEARNING OBJECTIVES:* | 04.03 - See how ERD components affect database design and implementation | |

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| 17. Relationships between entities always operate in one direction.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1h Relationship Participation | | *LEARNING OBJECTIVES:* | 04.03 - See how ERD components affect database design and implementation | |

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| 18. The existence of a mandatory relationship indicates that the minimum cardinality is 0 or 1 for the mandatory entity.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1h Relationship Participation | | *LEARNING OBJECTIVES:* | 04.03 - See how ERD components affect database design and implementation | |

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| 19. Referential integrity and participation are both bidirectional, meaning that they must be addressed in both directions along a relationship.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1j Recursive Relationships | | *LEARNING OBJECTIVES:* | 04.03 - See how ERD components affect database design and implementation | |

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| 20. To implement a small database, a database designer must know the "1" and the "M" sides of each relationship and whether the relationships are mandatory or optional.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1k Associative (Composite) Entities | | *LEARNING OBJECTIVES:* | 04.03 - See how ERD components affect database design and implementation | |

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| 21. The entity relationship diagram (ERD) represents the \_\_\_\_\_ database as viewed by the end user.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | condensed | b. | physical | |  | c. | logical | d. | conceptual |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1 The Entity Relationship Model | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 22. The \_\_\_\_\_ notation of entity-relationship modelling can be used for both conceptual and implementation modelling.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Bachman | b. | UML | |  | c. | Chen | d. | Crow's Foot |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1 The Entity Relationship Model | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 23. A(n) \_\_\_\_\_ is the set of possible values for a given attribute.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | domain | b. | range | |  | c. | identifier | d. | key |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 24. Ideally, an entity identifier is composed of \_\_\_\_\_ attribute(s).   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | one | b. | two | |  | c. | three | d. | six |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 25. A \_\_\_\_\_ attribute can be further subdivided to yield additional attributes.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | composite | b. | simple | |  | c. | single-valued | d. | multivalued |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 26. A \_\_\_\_\_ attribute is one that cannot be subdivided.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | composite | b. | simple | |  | c. | single-valued | d. | multivalued |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 27. The conceptual model can handle \_\_\_\_\_ relationships and multivalued attributes.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | 1:1 | b. | M:N | |  | c. | 1:M | d. | 1:N |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 28. A derived attribute is indicated in the Chen notation by a \_\_\_\_\_ that connects the attribute and an entity.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | single line | b. | dashed line | |  | c. | double dashed line | d. | double line |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 29. The decision to store \_\_\_\_\_ attributes in database tables depends on the processing requirements and the constraints placed on a particular application.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | multivalued | b. | derived | |  | c. | single-valued | d. | composite |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 30. A relationship is an association between \_\_\_\_\_.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | objects | b. | entities | |  | c. | databases | d. | fields |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1c Relationships | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 31. \_\_\_\_\_ expresses the minimum and maximum number of entity occurrences associated with one occurrence of the related entity.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | Connectivity | b. | Relationship | |  | c. | Dependence | d. | Cardinality |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1d Connectivity and Cardinality | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 32. In the entity relationship diagram (ERD), cardinality is indicated using the \_\_\_\_\_ notation, where max is the maximum number of associated entities and min represents the minimum number of associated entities.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | (max, min) | b. | (min, max) | |  | c. | [min ... max] | d. | {min|max} |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1d Connectivity and Cardinality | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 33. When the specific cardinalities are not included on the diagram in Crow's Foot notation, cardinality is implied by the use of \_\_\_\_\_.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | symbols | b. | attributes | |  | c. | images | d. | tables |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1d Connectivity and Cardinality | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 34. Knowing the minimum and maximum number of \_\_\_\_\_ occurrences is very helpful at the application software level.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | object | b. | attribute | |  | c. | data | d. | entity |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1d Connectivity and Cardinality | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 35. An entity is said to be \_\_\_\_\_-dependent if it can exist in the database only when it is associated with another related entity occurrence.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | existence | b. | relationship | |  | c. | business | d. | data |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1e Existence Dependence | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 36. If an entity can exist apart from all of its related entities, then it is existence-independent, and it is referred to as a(n) \_\_\_\_\_ entity.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | weak | b. | alone | |  | c. | unary | d. | strong |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1e Existence Dependence | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 37. A \_\_\_\_\_ entity has a primary key that is partially or totally derived from the parent entity in the relationship.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | strong | b. | weak | |  | c. | business | d. | child |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1f Relationship Strength | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 38. The existence of a(n) \_\_\_\_\_ entity indicates that its minimum cardinality is zero.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | ternary | b. | optional | |  | c. | strong | d. | weak |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1h Relationship Participation | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 39. A \_\_\_\_\_ relationship exists when an association is maintained within a single entity.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | unary | b. | ternary | |  | c. | strong | d. | weak |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1i Relationship Degree | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 40. A \_\_\_\_\_ relationship exists when three entities are associated.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | unary | b. | strong | |  | c. | ternary | d. | weak |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1i Relationship Degree | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 41. If an employee within an EMPLOYEE entity has a relationship with itself, that relationship is known as a \_\_\_\_\_ relationship.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | self | b. | self-referring | |  | c. | looping | d. | recursive |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1j Recursive Relationships | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 42. To simplify the conceptual design, most higher-order relationships are decomposed into appropriate equivalent \_\_\_\_\_ relationships whenever possible.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | unary | b. | binary | |  | c. | strong | d. | weak |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1i Relationship Degree | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 43. The entity relationship model uses the associative entity to represent a(n) \_\_\_\_\_ relationship between two or more entities.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | M:N | b. | 1:M | |  | c. | N:1 | d. | M:1 |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1k Associative (Composite) Entities | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 44. When using the Crow's Foot notation, the associative entity is indicated by \_\_\_\_\_ relationship lines between the parents and the associative entity.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | dotted | b. | double | |  | c. | triple | d. | solid |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1k Associative (Composite) Entities | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 45. The first step in building an entity-relationship diagram (ERD) is \_\_\_\_\_.   |  |  |  | | --- | --- | --- | |  | a. | developing the initial ERD | |  | b. | creating a detailed narrative of the organization’s description of operations | |  | c. | identifying the attributes and primary keys that adequately describe the entities | |  | d. | identifying the business rules based on the description of operations |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-2 Developing an ER Diagram | | *LEARNING OBJECTIVES:* | 04.03 - See how ERD components affect database design and implementation | |

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| 46. The Crow’s foot symbol with two vertical parallel lines indicates \_\_\_\_\_ cardinality.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | (0,N) | b. | (1,N) | |  | c. | (1,1) | d. | (0,1) |  |  |  | | --- | --- | | *ANSWER:* | c | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1h Relationship Participation | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 47. If Tiny College has some departments that are classified as “research only” and do not offer courses, the COURSE entity of the college database would be \_\_\_\_\_ the DEPARTMENT entity.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | existence-dependent on | b. | independent of | |  | c. | mandatory for | d. | optional to |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-2 Developing an ER Diagram | | *LEARNING OBJECTIVES:* | 04.03 - See how ERD components affect database design and implementation | |

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| 48. In organizations that generate large number of transactions, \_\_\_\_\_ are often a top priority in database design.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | relationships among entities | b. | logical design standards | |  | c. | naming conventions | d. | high processing speeds |  |  |  | | --- | --- | | *ANSWER:* | d | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-3 Database Design Challenges: Conflicting Goals | | *LEARNING OBJECTIVES:* | 04.04 - Understand that real-world database design often requires the reconciliation of conflicting goals | |

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| 49. Complex \_\_\_\_\_ requirements may dictate data transformations, and they may expand the number of entities and attributes within the design.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | information | b. | entity | |  | c. | design | d. | processing |  |  |  | | --- | --- | | *ANSWER:* | a | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-3 Database Design Challenges: Conflicting Goals | | *LEARNING OBJECTIVES:* | 04.04 - Understand that real-world database design often requires the reconciliation of conflicting goals | |

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| 50. Database design is a(n) \_\_\_\_\_ process based on repetition.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | a. | sequential | b. | iterative | |  | c. | linear | d. | intermittent |  |  |  | | --- | --- | | *ANSWER:* | b | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-2 Developing an ER Diagram | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 51. \_\_\_\_\_ are characteristics of entities.   |  |  | | --- | --- | | *ANSWER:* | Attributes | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 52. A(n) \_\_\_\_\_ attribute is an attribute that must have a value.   |  |  | | --- | --- | | *ANSWER:* | required | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 53. \_\_\_\_\_ are underlined in an ER diagram.   |  |  | | --- | --- | | *ANSWER:* | Identifiers | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 54. A person’s Social Security number would be an example of a(n) \_\_\_\_\_ attribute.   |  |  | | --- | --- | | *ANSWER:* | single-valued | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 55. A(n) \_\_\_\_\_ attribute need not be physically stored within the database.   |  |  | | --- | --- | | *ANSWER:* | derived | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 56. A relationship \_\_\_\_\_ is difficult to establish if only one side of the relationship is known.   |  |  | | --- | --- | | *ANSWER:* | classification | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1c Relationships | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 57. When indicating cardinality, the first value represents the \_\_\_\_\_ number of associated entities.   |  |  | | --- | --- | | *ANSWER:* | minimum | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1d Connectivity and Cardinality | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 58. The concept of relationship strength is based on how the \_\_\_\_\_ of a related entity is defined.   |  |  | | --- | --- | | *ANSWER:* | primary key | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1f Relationship Strength | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 59. A(n) \_\_\_\_\_ relationship is also known as an identifying relationship.   |  |  | | --- | --- | | *ANSWER:* | strong | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1f Relationship Strength | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 60. The Crow’s Foot notation depicts the strong relationship with a(n) \_\_\_\_\_ line between the entities.   |  |  | | --- | --- | | *ANSWER:* | solid | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1f Relationship Strength | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 61. A weak entity must be \_\_\_\_\_-dependent.   |  |  | | --- | --- | | *ANSWER:* | existence | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1g Weak Entities | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 62. The Chen notation identifies a weak entity by using a double-walled entity \_\_\_\_\_.   |  |  | | --- | --- | | *ANSWER:* | rectangle | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1g Weak Entities | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 63. Participation is \_\_\_\_\_ if one entity occurrence does not require a corresponding entity occurrence in a particular relationship.   |  |  | | --- | --- | | *ANSWER:* | optional | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1h Relationship Participation | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 64. In Crow’s Foot notation, an optional relationship between entities is shown by drawing a(n) \_\_\_\_\_ on the side of the optional entity.   |  |  | | --- | --- | | *ANSWER:* | small circle (O) | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1h Relationship Participation | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 65. Failure to understand the distinction between mandatory and optional \_\_\_\_\_ in relationships might yield designs in which awkward (and unnecessary) temporary rows (entity instances) must be created just to accommodate the creation of required entities.   |  |  | | --- | --- | | *ANSWER:* | participation | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1h Relationship Participation | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 66. A relationship \_\_\_\_\_ indicates the number of entities or participants associated with a relationship.   |  |  | | --- | --- | | *ANSWER:* | degree | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-1i Relationship Degree | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 67. A(n) \_\_\_\_\_ process is based on repetition of processes and procedures.   |  |  | | --- | --- | | *ANSWER:* | iterative | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-2 Developing an ER Diagram | | *LEARNING OBJECTIVES:* | 04.03 - See how ERD components affect database design and implementation | |

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| 68. Identifying the attributes of entities helps in the better understanding of \_\_\_\_\_ among entities.   |  |  | | --- | --- | | *ANSWER:* | relationships | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-2 Developing an ER Diagram | | *LEARNING OBJECTIVES:* | 04.03 - See how ERD components affect database design and implementation | |

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| 69. \_\_\_\_\_ not only helps database designers to stay on track during the design process, it also enables them to pick up the design thread when the time comes to modify the design.   |  |  | | --- | --- | | *ANSWER:* | Documentation | | *DIFFICULTY:* | Difficulty: Easy | | *REFERENCES:* | 4-3 Database Design Challenges: Conflicting Goals | | *LEARNING OBJECTIVES:* | 04.04 - Understand that real-world database design often requires the reconciliation of conflicting goals | |

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| 70. In organizations that generate large numbers of transactions, \_\_\_\_\_ processing speeds are often a top priority in database design, which result in minimal access time.  ​   |  |  | | --- | --- | | *ANSWER:* | high | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-3 Database Design Challenges: Conflicting | | *LEARNING OBJECTIVES:* | 04.04 - Understand that real-world database design often requires the reconciliation of conflicting goals | |

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| 71. Explain multivalued attributes with the help of examples. How are multivalued attributes indicated in the Chen Entity Relationship model?   |  |  | | --- | --- | | *ANSWER:* | Multivalued attributes are attributes that can have many values. For instance, a person may have several college degrees, and a household may have several different phones, each with its own number. Similarly, a car's color may be subdivided into many colors for the roof, body, and trim. In the Chen Entity Relationship model, multivalued attributes are shown by a double line connecting the attribute to the entity. | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1b Attributes | | *LEARNING OBJECTIVES:* | 04.01 - Identify the main characteristics of entity relationship components | |

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| 72. What is a weak relationship? Provide an example.   |  |  | | --- | --- | | *ANSWER:* | A weak relationship, also known as a non-identifying relationship, exists if the primary key of the related entity does not contain a primary key component of the parent entity. By default, relationships are established by having the primary key of the parent entity appear as a foreign key (FK) on the related entity (also known as the child entity). For example, suppose the 1:M relationship between COURSE and CLASS is defined as:  COURSE (**CRS\_CODE**, DEPT\_CODE, CRS\_DESCRIPTION, CRS\_CREDIT)  CLASS (**CLASS\_CODE**, CRS\_CODE, CLASS\_SECTION, CLASS\_TIME, ROOM\_CODE, PROF\_NUM)  In this case, a weak relationship exists between COURSE and CLASS because CRS\_CODE (the primary key of the parent entity) is only a foreign key in the CLASS entity. In this example, the CLASS primary key did not inherit a primary key component from the COURSE entity. | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1f Relationship Strength | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 73. Explain mandatory participation in an entity relationship.   |  |  | | --- | --- | | *ANSWER:* | Mandatory participation means that one entity occurrence requires a corresponding entity occurrence in a particular relationship. If no optionality symbol is depicted with the entity, the entity is assumed to exist in a mandatory relationship with the related entity. If the mandatory participation is depicted graphically, it is typically shown as a small hash mark across the relationship line, similar to the Crow's Foot depiction of a connectivity of 1. The existence of a mandatory relationship indicates that the minimum cardinality is at least 1 for the mandatory entity. | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1h Relationship Participation | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 74. What is a ternary relationship? Provide some business rules examples that specify the need for a ternary or higher-order relationship.   |  |  | | --- | --- | | *ANSWER:* | A ternary relationship implies an association among three different entities. Although most relationships are binary, the use of ternary and higher-order relationships does allow the designer some latitude regarding the semantics of a problem. Some business rules examples that specify the need for a ternary relationship are:  • A DOCTOR writes one or more PRESCRIPTIONs.  • A PATIENT may receive one or more PRESCRIPTIONs.  • A DRUG may appear in one or more PRESCRIPTIONs. (Assume that the business rule states that each prescription contains only one drug. In short, if a doctor prescribes more than one drug, a separate prescription must be written for each drug.) | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1i Relationship Degree | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |

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| 75. Explain recursive relationships with the help of an example.   |  |  | | --- | --- | | *ANSWER:* | A recursive relationship is one in which a relationship can exist between occurrences of the same entity set. Such a condition is found within a unary relationship. For example, a 1:M unary relationship can be expressed by "an EMPLOYEE may manage many EMPLOYEEs, and each EMPLOYEE is managed by one EMPLOYEE." Finally, the M:N unary relationship may be expressed by "a COURSE may be a prerequisite to many other COURSEs, and each COURSE may have many other COURSEs as prerequisites." | | *DIFFICULTY:* | Difficulty: Moderate | | *REFERENCES:* | 4-1j Recursive Relationships | | *LEARNING OBJECTIVES:* | 04.02 - Describe how relationships between entities are defined, refined, and incorporated into the database design process | |