CSIS 3222, Fall 2008, Chapter 1, 3, 4, 5 (through p. 128) Name_____

(Six Pages)

Part I: MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. (3 points each)

1) A database records:
A) figures.
B) facts.
C) information.
D) facts and figures
E) facts, figures and information

2) In an enterprise-class database system _____.
A) the database application(s) access(es) the database data
B) the DBMS accesses the database data
C) the database application(s) interact(s) with the DBMS
D) the database application(s) interact(s) with the DBMS and the database application(s) access(es) the database data
E) the database application(s) interact(s) with the DBMS and the DBMS accesses the database data

3) The industry standard supported by all major DBMSs that allows tables to be joined together is called _____.
A) Relational Query Language (RQL)
B) Structured Query Language (SQL)
C) Relational Question Language (RQL)
D) Structured Question Language (SQL)
E) Sequential Query Language (SQL)

4) The predecessor(s) of database processing was (were) _____.
A) network models
B) hierarchical models
C) file managers
D) relational data model
E) All of the above were predecessors of database processing

5) Database professionals use a set of principles called _____ to guide and assess database design.
A) entity-relationship data modeling
B) data migration
C) data marts
D) normalization
E) data models

6) A database designed to combine two databases used by the Sales department is a database being designed _____.
A) as a redesign of an existing database
B) as a new systems development project
C) from existing data
D) as a redesign of an existing database and as a new systems development project
E) as a redesign of an existing database, as a new systems development project, and from existing data

7) Saying that two entities are functionally dependent means that _____.
A) the functional dependency will have to be removed through normalization
B) for both of the entities, if we are given the value of that entity, we can determine the value of one other entity
C) the entities are always connected by a mathematical equation
D) for one of the entities, if we are given the value of that entity, we can determine the value of one other entity
E) All of the above.

8) If a relation is in BCNF, and each multivalued dependency has been moved to a relation of its own, then the first relation is in _____.
A) Second Normal Form
B) Third Normal Form
C) Fourth Normal Form
D) Boyce-Codd Normal Form
E) First Normal Form

9) A relation is also known as a(n) _____.
A) relationship
B) attribute
C) tuple
D) table
E) field

10) An artificial column added to a relation to serve as the primary key is a(n) _____.
A) candidate key
B) dependency
C) composite key
D) foreign key
E) surrogate key

11) A form of multivalued dependency is found in _____.
A) the inconsistent values problem
B) the missing values problem
C) the general-purpose remarks column problem
D) the multivalued, multicolumn problem
E) None of the above is correct.

12) You are creating a PRODUCT table using existing data from multiple sources. Examining the data, you find that you have "large red hat", "large hat, red", "red hat large" and "hat, large, red." This is an example of _____.
A) the multivalue, multicolumn problem
B) the general-purpose remarks column problem
C) the missing values problem
D) the inconsistent values problem
E) None of the above is correct.

13) The advantages of normalization include _____.
A) the elimination of modification anomalies
B) more complex SQL for multitable subqueries and joins
C) the elimination of duplicated data
D) the elimination of modification anonmalies and the elimination of duplicated data
E) the elimination of modification anonmalies , the elimination of duplicated data and more complex SQL for multitable subqueries and joins

14) A very popular development technique used by database professionals to adopt a database design to new or changing requirement is known as _____.
A) data models
B) data marts
C) entity-relationship data modeling
D) data migration
E) normalization

15) A very popular development technique used by database professionals for database design is known as _____.
A) data migration
B) normalization
C) entity-relationship data modeling
D) data marts
E) data models

16) Given the functional dependency (A, B) → C, (A, B) is a(n) _____.
A) dependent variable
B) independent variable
C) determinant
D) composite determinant
E) determinant and composite determinant

17) Unlike the anomalies from functional dependencies, the anomalies from _____ are so serious that they should always be eliminated.
A) sales orders and line items
B) general purpose remarks columns
C) association patterns
D) ZIP codes
E) multivalued dependencies

18) The relational model _____.
A) resulted in the DBMS product DB2
B) was first proposed in 1970
C) was developed by E. F. Codd
D) was developed at IBM
E) All of the above

19) A table that meets the definition of a relation is in _____.
A) Second Normal Form
B) Fourth Normal Form
C) Boyce-Codd Normal Form
D) Third Normal Form
E) First Normal Form

20) A table designed to store PhoneNumber01, PhoneNumber02 and PhoneNumber03 contains _____.
A) the general-purpose remarks column problem
B) the multivalued, multicolumn problem
C) the inconsistent values problem
D) the missing values problem
E) None of the above is correct.

21) For a relationship to be considered a binary relationship it must satisfy which of the following conditions?
A) It must have a maximum cardinality of 1:1.
B) It must involve exactly two entity classes.
C) It must have a maximum cardinality of 1:N.
D) It must involve exactly two entity classes and it must have a maximum cardinality of 1:1
E) It must involve exactly two entity classes and it must have a maximum cardinality of 1:N

22) The occurrence of a particular entity is called a(n) _____.
A) entity class
B) entity attribute
C) entity relationship
D) entity instance
E) None of the above.

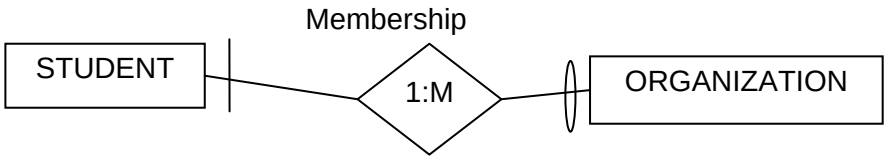
23) Attributes may be _____.
A) element
B) composite
C) multivalued
D) both composite and multivalued
E) both element and multivalued

24) For a relationship to be considered a binary relationship it must satisfy which of the following conditions?
A) It must have a maximum cardinality of 1:N.
B) It must involve exactly two entity classes.
C) It must have a maximum cardinality of 1:1.
D) It must involve exactly two entity classes and it must have a maximum cardinality of 1:1
E) It must involve exactly two entity classes and it must have a maximum cardinality of 1:N

25) Minimum cardinality refers to _____.
A) the most instances of one entity class that can be involved in a relationship with one instance of another entity class
B) whether or not an entity is a weak entity
C) the minimum number of entity classes involved in a relationship
D) whether or not an instance of one entity class is required to be related to an instance of another entity class
E) None of the above

Part II.

1. For the following diagram, write four cardinality statements. (5 points)



2. Consider the following relation and sample data to complete the following items:

STUDENT

StudentID	Sname	LockerNo	Type	LockerFee
7369	SMITH	20	SINGLE	30
7499	ALLEN	30	DOUBLE	10
7521	WARD	30	DOUBLE	10
7698	BLAKE	10	SINGLE	30

STUDENT(StudentID, Sname, LockerNo, Type, LockerFee)

Where

StudentID is a unique identifier for the student,
Sname may not be unique,
A student may have at most one locker,
LockerNo is a unique identifier of a locker,
Type is the type of a particular locker, and
LockerFee is the same for any locker of a particular type.

Using the white space to the right of the table, state any additional rules or assumptions that you make to determine the truth value of the following statements or to answer the following questions (even if you think they are obvious). However, **do not violate the problem statement or the rules implied by the current data.**

a. Describe one modification anomaly in the above table. What problem exists? What kind of anomaly is your example (1 point)?

b. Is STUDENT a relation (0.1 Points)? Use the definition of a relation to justify your answer (0.9 Points).

c. List the functional dependencies that exist (6 points).

d. List the candidate keys. (2 point)

e. Choose and indicate a primary key for this table. (2 point)

3. Use Kroenke's method to redesign the **MEMBER** table below to eliminate the modification anomalies. Your final tables will be in BCNF if you use the rule correctly. The first steps are done for you: the functional dependencies and candidate keys are listed below the table. **Justify each step of your solution. The tables alone are not worth many points.** Use, if you need it. (8 points)

MEMBER

MemberID	Mname	Class	MemberType	ClassFee

7369	SMITH	Spinning	SINGLE	30
7499	ALLEN	Spinning	FAMILY	30
7499	ALLEN	Yoga	FAMILY	15
7521	WARD	Yoga	SINGLE	15
7698	BLAKE	Aerobic Dance	FAMILY	10

MemberID → (Mname, MemberType)

(MemberID, Class) → (Mname, MemberType, ClassFee)

Class → ClassFee

The candidate key is (MemberID, Class)

Justify each step of your solution. The tables, alone, are not worth many points.