1. Which one of the following is a set of one or more attributes taken collectively

to uniquely identify a record?

a) Candidate key b) Sub key **c) Super key** d) Foreign key

2. Consider attributes ID, CITY and NAME. Which one of this can be considered

as a super key?

a) NAME b) ID c) CITY **d) CITY, ID**

3. The subset of a super key is a candidate key under what condition?

**a) No proper subset is a super key** b) All subsets are super keys c) Subset is a super

key d) Each subset is a super key

4. A \_\_\_ is a property of the entire relation, rather than of the individual tuples

in which each tuple is unique.

a) Rows b) Key **c) Attribute** d) Fields

5. Which one of the following attribute can be taken as a primary key?

a) Name b) Street **c) Id** d) Department

6. Which one of the following cannot be taken as a primary key?

a) Id b) Register number c) Dept\_id **d) Street**

7. An attribute in a relation is a foreign key if the \_\_\_\_\_ key from one relation

is used as an attribute in that relation.

a) Candidate **b) Primary** c) Super d) Sub

8. The relation with the attribute which is the primary key is referenced in

another relation. The relation which has the attribute as a primary key is called

\_\_\_\_\_\_\_\_\_\_\_\_

a) Referential relation b) Referencing relation **c) Referenced relation** d) Referred

relation

9. The \_\_\_\_ is the one in which the primary key of one relation is used as a

normal attribute in another relation.

a) Referential relation **b) Referencing relation** c) Referenced relation d) Referred

relation

10. A \_\_\_\_\_\_\_ integrity constraint requires that the values appearing in

specified attributes of any tuple in the referencing relation also appear in

specified attributes of at least one tuple in the referenced relation.

**a) Referential** b) Referencing c) Specific d) Primary

**Classwork**

1. Define the following terms: tuple, attribute, domain, relation, key, and

schema.

Tuple – a row in a relation

Attribute – a named column in a relation

Domain – a set of allowable data types for an attribute

Relation – a table made up of columns and rows with a relation being in the data

Key – an attribute or set of attributes that can be used to identify a tuple

Schema – the definition and layout of how data is organized in a database

2. Explain the difference between a table and a relation in the context of the

relational model

A table can be a relation, but a relation isn’t necessarily a table. Relations cannot have duplicate rows due to constraints, but tables have less rules applied to them.

3. Describe how attributes are represented in a relation. Provide examples.

Attributes are represented as columns which have data that is related. An example would be a column called “name” which holds the names of clients saved in the database.

4. Explain how tables organize data in a relational database and why they are

considered a fundamental component.

Tables organize data by dividing it up into smaller groups of related data while also having relationships with outside tables. This is fundamental because it allows for easier access to data and is simpler to understand for people using the database.

5. Provide an example scenario and describe how you would represent it using

a table in the relational model.

A good example for me would be notes. If I had a database for notes, I could make tables for the individual topics that I take notes on as well as tables for the individual classes I take, where I could have a column that would allow me to specify the topic or lecture that those notes were a part of as well as potentially links to resources or images that show helpful diagrams.

6. Explain the concept of a tuple in the context of a database table. Provide an

example of a tuple.

A tuple is a row in a table that is distinct from all other rows at least in some attribute, because no two tuples can be exactly alike. An example would be an entry for a student that holds their name, grade, age, address and other identifiers.

7. Discuss the importance of ensuring uniqueness of rows (no duplicates) in a

database relation.

The importance of unique rows is high because it helps distinguish the data from other data that may be similar, but belongs to a different relation.

8. How are null values handled in a relational table, and what purpose do they

serve?

Null values in a database are simply empty spaces in the database, where no data is contained at all.

9. Explain how the concept of a relation in the relational model corresponds to

a mathematical relation. Provide examples.

A relation in a model is similar to a mathematical relation in that it holds connected values together in a group, separated from the other values, even though all of those values can belong to the same equation or function.

10. Discuss how mathematical set operations (e.g., union, intersection) can be

applied to relations in the relational model.

Mathematical set operations can be applied to relations by applying conditions or constraints to the attributes in a relation.

11. How do attribute domain constraints contribute to the integrity of a

relational database?

They ensure that the data being entered in a certain column is of the data type that it is meant to store, which keeps faulty data from being entered.

12. Define candidate keys (CK) and explain their role in database design.

Differentiate between candidate keys and primary keys (PK) and provide an

example of each.

A primary key is always a single column used to identify an entry, but a candidate key is one or more columns that, combined, are used as a primary key. An example would be pairing someone’s name and birthday as a candidate key to identify them vs using their social security number as a primary key.

13. Explain how foreign keys (FKs) establish relationships between tables in a

database. Provide a real-world scenario.

Foreign keys allow for related data entries to be tied together across tables using Foreign Keys to point to the related data in the other tables. An example would be having a table for a specific classroom that has foreign keys for all of the individuals that attend that class.

14. Given a table, how would you identify the candidate keys and choose a

primary key?

Candidate keys would be identified by spotting unique identifiers or columns that could be paired together to create a unique identifier, while a primary key could be a simple auto-incremented number or a value that is unique to each entry.

15. Define entity integrity and explain why it is important in maintaining data

integrity.

Entity integrity ensures that a primary key of an entry is never null. This is important because it guarantees that the data is uniquely identifiable.

16. Define referential integrity and its role in maintaining data consistency

between related tables.

Referential integrity ensures that all foreign keys either point to a specific primary key or is null in order to avoid missing or faulty relations.

17. Describe the actions that can be taken when a foreign key constraint is

violated.

If a foreign key constraint is violated, you can provide checks that keep this data from being entered.

18. Define a database view and explain its purpose in database management.

A database view is a way to view relations of a database that isn’t necessarily real, but virtual. Its purpose is to provide customization to accessibility of a database as well as to improve security.

19. Discuss the advantages of using views in database design and query

optimization.

Views allow queries to be simplified, customized, and secured.

20. Provide an example of a situation where creating a view would be beneficial

in simplifying complex queries or enhancing security.

In a business setting, being able to hide certain details from some users such as salaries or other confidential data would be vital.