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**Assignment Title:** Introduction to SQL
**Course Title:** Data Management I
**Course Code:** CSC 306

**TEST**

1. Mention five charateristics of a good database.
2. Explain what is meant by saying that a  relationship is “optional”
3. Explain what is meant by saying that an entity set may have “partial participation” in a relationship
4. Differentiate between DDL and DML with examples
5. A University computer laboratory requires a booking system to enable students to book a specific lab computer at a specific time. The students must be enrolled on certain authorized courses. Some of the computers have special facilities and/or additional equipment such as large memory, scanner, speech input etc. Design an ER diagram to model this application and then derive a set of relational tables from the ER diagram, using appropriate choices for the table attributes. Indicate the foreign keys used and for each specify whether a null entry would be allowable.

**SOLUTION**

1. **Characteristics of a good database**

a. Should be able to store all kinds of data that exists in this real world. Since we need to work with all kinds of data and requirements, database should be strong enough to store all kinds of data that is present around us.

b. Should be able to relate the entities / tables in the database by means of a relation. i.e.; any two tables should be related. Let us say, an employee works for a department. This implies that Employee is related to a particular department. We should be able to define such a relationship between any two entities in the database. There should not be any table lying without any mapping.

c. Data and application should be isolated. Because database is a system which gives the platform to store the data, and the data is the one which allows the database to work. Hence there should be clear differentiation between them.

d. There should not be any duplication of data in the database. Data should be stored in such a way that it should not be repeated in multiple tables. If repeated, it would be unnecessary waste of DB space and maintaining such data becomes chaos.

e. DBMS has a strong query language. Once the database is designed, this helps the user to retrieve and manipulate the data. If a particular user wants to see any specific data, he can apply as many filtering conditions that he wants and pull the data that he needs.

1. **Explain what is meant by saying that a  relationship is “optional”**

We can extend the entity-relationship model by declaring that some relationships are mandatory, whereas others are optional. In a mandatory relationship, every instance of one entity must participate in a relationship with another entity. In an optional relationship, any instance of one entity might participate in a relationship with another entity, but this is not compulsory.

1. **Explain what is meant by saying that an entity set may have “partial participation” in a relationship**

Partial Participation is when each entity in the entity set may not occur in at least one relationship in that relationship set. For instance, If a company policy states that employee (manager) must manage a department, However every employee may not manage a department, so the participation of EMPLOYEE in the MANAGES relationship type is partial, meaning that some or part of the set of employee entities are related to some department entity via MANAGES, but not necessarily all. Note: Partial Participation is represented by single line connecting entities in relationship.

1. **Differentiate between DDL and DML with examples**

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| **Basis for Comparison** | **DDL** | **DML** |
| Basic | DDL is used to create the database schema. | DML is used to populate and manipulate database |
| Full Form | Data Definition Language | Data Manipulation Language |
| Classification | DDL is not classified further. | DML is further classified as Procedural and Non-Procedural DMLs. |

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