Written Problems: (10 points) Explain in your own words.

**1. What is the difference between logical and physical data independence?**

Physical data independence is the ability to modify the physical scheme without having to rewrite the program

logical data independence is the ability to modify the conceptual scheme without having to rewrite the program

**2. Describe the three schema architecture and levels of abstraction.**

Physical, performs the actual operations requested by the user, along with data types and operations, this level contains many more technical details that average users do not need to see

Conceptual, this level consolidates the external concepts into a data structure that can become physical instructions. it is effectively the translator between the user, and the database

External, users at this level often do not use sql, and instead use some form of interface to decide on how to manipulate data

**3. What is a data model? What is the relational data model? Describe at least two different categories of data models other than relational.**

A database model is a data model that will determine the logical structure of the database. it will determine how the databases contents will be organized, and manipulated

A relational database will use specific columns as references for other tables as a student table will have a student id, that student id will act as a reference in other tables to all instances of that students activity in other tables.

Document oriented databases, will store all information for a given object within a single instance of the database, every stored object can be different from one another.

Entity - relationship model will describe the important interrelated items within a realm of knowledge. an ER model will display an entity type, and the relationships that the specific relationships that the specified entity may have.

**5. When would you store data in a DBMS instead of in operating system files and vice-versa?**

If the data requires a large amount of space, and quick retrieval an operating system file retrieval would be to slow. Multiple users should not be aware of each other, a DBMS is capable of handling this.