**Chapter 9 - Review Questions**

**5. Discuss the distinction between centralized and decentralized conceptual database design.**

* Centralized and decentralized design constitute variations on the bottom-up and top-down approaches we discussed in the third question presented in the discussion focus. Basically, the centralized approach is best suited to relatively small and simple databases that lend themselves well to a bird's-eye view of the entire database. Such databases may be designed by a single person or by a small and informally constituted design team. The company operations and the scope of its problems are sufficiently limited to enable the designer(s) to perform all of the necessary database design tasks:

1. Define the problem(s).
2. Create the conceptual design.
3. Verify the conceptual design with all user views.
4. Define all system processes and data constraints.
5. Assure that the database design will comply with all achievable end user requirements.

**6. What is the minimal data rule in conceptual design? Why is it important?**

* The minimal data rule specifies that all the data defined in the data model are actually required to fit present and expected future data requirements. This rule may be phrased as: ***All that is needed is there, and all that is there is needed***.

1. **Discuss the distinction between top-down and bottom-up approaches in database design.**
   * There are two basic approaches to database design: top‑down and bottom‑up.
2. Top-down – Top-down design starts by identifying the data sets, and then defines the data elements for each of those sets. This process involves the identification of different entity types and the definition of each entity’s attributes.
3. Bottom-up – Bottom up design first identifies the data elements (items), and then groups them together in data sets. In other words, it first defines attributes, and then groups them to form entities.

**13. What three levels of backup may be used in database recovery management? Briefly describe what each of those three backup levels does.**

* + When any failure happens because of the software, hardware or external factors, the data from the backup of the database is what you can use to recover the previous data.  Therefore, scheduling automatic database backup is important for data recovery.  In database recovery management, there are three levels of backups::
  1. Full backup level – Full backup (or dump) gives an exact copy of the entire database.
  2. Different backup level – Differential backup copies a part of the database that contains the updates completed after the latest backup copy.
  3. Transaction log backup level – This backup copies the transactions that are recorded in the transaction log between after the previous backup and just before the failure.

**Chapter 9 – Problems**

**5. Write the proper sequence of activities in the design of a video rental database. (The initial ERD was shown in Figure 9.7.) The design must support all rental activities, customer payment tracking, and employee work schedules, as well as track which employees checked out the videos to the customers. After you finish writing the design activity sequence, complete the ERD to ensure that the database design can be successfully implemented. (Make sure that the design is normalized properly and that it can support the required transactions.)**

* The video rental shop classifies movie titles according to their type. Each type contains many possible titles, and most titles within a type are available in multiple copies. The sequence of activities would be as follow:
  + Define entities, attributes, primary keys, and foreign keys. (The foreign keys serve as the basis for the relationships among the entities.)
  + Make decisions about adding new primary key attributes to satisfy end-user and/or processing requirements.
  + Make decisions about the treatment of multivalued attributes.
  + Make decisions about adding derived attributes to satisfy processing requirements.
  + Make decisions about the placement of foreign keys in 1:1 relationships.
  + Avoid unnecessary ternary relationships.
  + Draw the corresponding ER diagram.
  + Normalize the entities.
  + Include all data element definitions in the data dictionary.
  + Make decisions about standard naming conventions.

The ERD is as follows:

VIDEO\_ID

CUST\_NUM

PK, FK2

PK, FK1

VIDEO\_ID

VIDEO\_CLASS

VIDEO\_TITLE

VIDEO\_CHG

VIDEO

RENTAL\_OUT

PK

RENTAL\_RETURN

RENTAL

CUST\_NUM

PK

CUST\_E\_MAIL

CUST\_INITIAL

CUST\_FNAME

CUST\_LNAME

CUSTOMER