Sheet 1 (Database Management System)

1) List four significant differences between a file-processing system and a DBMS.

Answer: Some main differences between a database management system and a file-processing system are:

• Both systems contain a collection of data and a set of programs which access that data. A database management system coordinates both the physical and the logical access to the data, whereas a file-processing system coordinates only the physical access.

• A database management system reduces the amount of data duplication by ensuring that a physical piece of data is available to all programs authorized to have access to it, whereas data written by one program in a file-processing system may not be readable by another program.

• A database management system is designed to allow flexible access to data (i.e., queries), whereas a file-processing system is designed to allow pre-determined access to data (i.e., compiled programs).

• A database management system is designed to coordinate multiple users accessing the same data at the same time. A file-processing system is usually designed to allow one or more programs to access different data files at the same time. In a file-processing system, a file can be accessed by two programs concurrently only if both programs have read-only access to the file.

2) Explain the difference between physical and logical data independence.

Answer:

• Physical data independence is the ability to modify the physical scheme without making it necessary to rewrite application programs. Such modifications include changing from unblocked to blocked record storage, or from sequential to random access files.

• Logical data independence is the ability to modify the conceptual scheme without making it necessary to rewrite application programs. Such a modification might be adding a field to a record; an application program’s view hides this change from the program.

3) What are five main functions of a database administrator?

Answer: Five main functions of a database administrator are:

• To create the scheme definition

• To define the storage structure and access methods

• To modify the scheme and/or physical organization when necessary

• To grant authorization for data access

• To specify integrity constraints

4) List six major steps that you would take in setting up a database for a particular enterprise.

Answer: Six major steps in setting up a database for a particular enterprise are:

• Define the high level requirements of the enterprise (this step generates a document known as the system requirements specification.)

• Define a model containing all appropriate types of data and data relationships.

• Define the integrity constraints on the data.

• Define the physical level.

• For each known problem to be solved on a regular basis (e.g., tasks to be carried out by clerks or Web users) define a user interface to carry out the task, and write the necessary application programs to implement the user interface.

• Create/initialize the database.

5) List four applications you have used that most likely employed a database system to store persistent data

6) Definitions: Data Manipulation Language, Data Definition Language, Database management System, Relational database,