Nama : Afina Putri Dayanti

NIM : 825200049

Jurusan : Sistem Informasi

Mata Kuliah : Database Systems

1.2 Discuss each of the following terms:

1. Data : raw facts of non processed data
2. Database : shared collection of logically related data
3. Database management system : software system that allows user to define read, access, and create data. takes requests and applies to database
4. Database application program : app that interacts with the database at somepoint in its execution
5. Data independence : immunity of user apps to changes made in the definition and organization of data
6. Security : allows multiple users to access the data at once, and secure
7. Integrity : ssurance of accuracy and consistency of data which stores, processes and retrives data
8. Views :  virtual table defined by a query that contains a subset of info
   1. Describe the approach taken to the handling of data in the early file-based systems. Discuss the disadvantages of this approach.

Answer : Handling data in the early file based system focuses on applications for which program will be formulated, complete data and information is stored in files owned by the program.  
This approach may include duplication of data, file formats may not be compatible

# Describe the main characteristics of the database approach and contrast it with the file-based approach

Answer : Focus is now on the data first, and then the applications. The structure of the data is now kept separate from the programs that operate on the data. This is held in the system catalog or data dictionary. Programs can now share data, which is no longer fragmented. There is also a reduction in redundancy, and achievement of program-data independence.

* 1. What is a data model? Discuss the main types of data model

Answer : An integrated collection of concepts for describing and manipulating data, relationships between data, and constraints on the data in an organization.

Types of data model :

* Object-based data models such as the Entity-Relationship model
* Record-based data models such as the relational data model, network data model, and hierarchical data model
* Physical data models describe how data is stored in the computer
  1. Discuss the function and importance of the system catalog

Function of the system catalog

* System catalog is known as a data dictionary of DBMS
* Along with the schemas of the database it also stores the metadata in the database
* It can be queried by the users like all the other tables in the database
* Actually the system catalog is a mini database and is generally stored using the DBMS itself by making use of the special tables known as the system tables
* Since it is active it can be referred to as being won liner

Importance of the system catalog

* Information about data can be centrally collected and stored
* Communications are simplified

3.1 Discuss each of the following concepts in the context of the relational data model:

1. Relation : table with columns and rows
2. Attribute : named column of a relation
3. Domain : the set of allowable values for one or more attributes
4. Tuple : row of a relation
5. Intension and extension : a functional dependency is a property of a relational schema (intension) and not a property of a particular instance of the schema (extension)
6. Degree and cardinality : The degree of a relation is the number of attributes, while the cardinality is the number of tuples.
   1. Describe the differences between a relation and a relation schema. What is a relational database schema?

Answer : A relation schema is a named relation defined by a set of attribute and domain name pairs. A relational database schema is a set of relation schemas, each with a distinct name.

* 1. Discuss the differences between the candidate keys and the primary key of a relation. Explain what is meant by a foreign key. How do foreign keys of relations relate to candidate keys? Give examples to illustrate your answer.

Answer : The primary key is the candidate key that is selected to identify tuples uniquely within a relation. A foreign key is an attribute or set of attributes within one relation that matches the candidate key of some (possibly the same) relation.