DBMS CONCEPTS

Chapter 12

Type A: Very Short Answer Questions

1	**What is the function of database management system?**
Ans.	Following are the function of database management system: ✓ To organize information ✓ To store information ✓ To retrieve information as efficiently and effectively as possible
2	**What is data redundancy? What are the problems associated with it?**
Ans.	Data redundancy means duplication of data. It causes duplicate data at different locations which destroys the integrity of the database and wastage of storage space.
3	**How do database management systems overcome the problems associated with data redundancy?**
Ans.	Database normalization prevents redundancy and makes the best possible usage of storage .Proper use of foreign keys can minimize data redundancy and chance of destructive anomalies. However, concerns of efficiency and convenience can sometimes result in redundant data design despite the risk of corrupting the data. A solution to the problem is to place the redundant data in a separate table, one in which the data no longer will be redundant.
4	**How do database management systems ensure data security and privacy?**
Ans.	A database management system ensure data security and privacy by ensuring that only means of access to the database is through the proper channel and also by carrying out authorization checks whenever access to sensitive data is attempted.
5	**What are the three levels of data abstraction?**
Ans.	**a.** Internal Level **b.** Conceptual Level **c.** External Level (View Level)
6	**What do you understand by data independence?**
Ans.	Data independence allows modification of a scheme definition in one level without affecting a scheme definition in the next higher level.
7	**What are the two types of data independence? How they different?**
Ans.	There are two levels of data independence: Physical and Logical. **Physical Data** Independence modifies the scheme followed at the physical level without affecting the scheme followed at the conceptual level. Whereas **Logical Data** Independence modifies the conceptual scheme without causing any changes in the schemes followed at view levels.
8	**Define the following terms :** **(i) Integrated database** **(ii) Shared database** **(iii) View** **(iv) Database system** **(v) Data security** (vi) **Data integrity**
Ans.	**(i) Integrated database:** Integrated database means union of several otherwise distinct data files, with any redundancy among those files partially or wholly eliminated. **(ii) Shared database:** Sharing of data means that individual pieces of data in the database may be shared among several different users, in the sense that each of those users may have access to the same piece of data and each of them may use it for different purpose. The database which contains this type of data is called shared database. **(iii) View:** A view is a pseudo-table or virtual table. It displays the data. The data is derived from one or more base tables. **(iv) Database system:** A database is a collection of interrelated data and a database system is basically a computer base recordkeeping system.

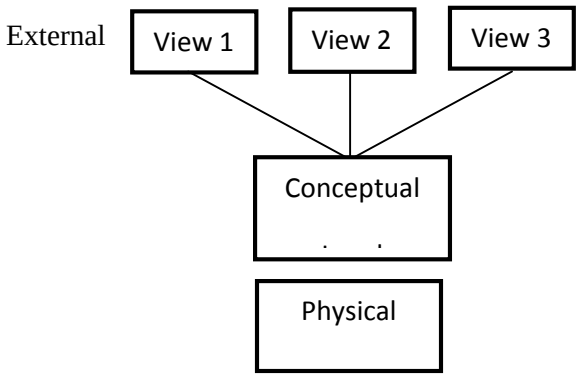
	(v) Data security: Data security refers to protection of data against accidental or intentional disclosure to unauthorized persons, or unauthorized modification or destruction. **(vi) Data integrity:** Data integrity refers to maintaining and assuring the accuracy and consistency of data over its entire life cycle
9	**Name the different data models available for database system. Which of them is the most preferred one?**
Ans.	There are generally three data models available as following : (i) Relational Model (ii) Network Model (iii) Hierarchical Model Among these three level relational levels is the most preferred one because it does not use pointers or links. Instead, it relates records by the values they contain.
10	**What are the similarities and differences between network and hierarchical data models?**
Ans.	The network model and hierarchical model are similar in the sense that data and relationships among data are represented by records and links respectively. The difference between these two is that in network model records are organized as collection of arbitrary graphs and in hierarchical model records are organized as collection of trees.
11	**Define the following terms :** **(i) Relation** **(ii) Domain** **(iii) Tuple** **(iv) Attribute** **(v) Degree** **(vi) Cardinality** **(vii)Primary key** **(viii) Candidate key** **(ix) Cartesian product**
Ans.	**(i) Relation**: A relation is a two-dimensional table. It contains number of rows (tuples) and columns (attributes). **(ii) Domain**: A domain is a pool of values from which the actual value present in a given column is taken. **(iii) Tuple**: This is the horizontal part of the relation. One row represents one record of the relation. The rows of a relation are also called tuples. **(iv) Attribute**: The columns of a table are also called attributes. The column is the vertical part of the relation. **(v) Degree**: It is the number of columns (or attributes) in a table. **(vi) Cardinality**: The number of tuples in a relation is called the cardinality of relation. **(vii)Primary key**: It is a column (or columns) in a table that uniquely identifies each row. A primary key value is unique and cannot be null. There is only one primary key for a table. **(viii) Candidate key**: It is a column (or columns) that uniquely identify rows in a table. Any of the identified candidate keys can be used as the table's primary key. **(ix) Cartesian product**: The Cartesian product is a binary operation and is denoted by a cross(x). It yields a relation with all possible combinations of the tuples of the two relations operated upon.
12	**What do you mean by relational database?**
Ans.	A **relational database** is a collection of data items organized as a set of formally described tables from which data can be accessed easily.
13	**What are views? How are they useful?**
Ans.	A **view** is a pseudo-table or virtual table. It displays the data. The data is derived from one or more base tables. **Syntax:** CREATE VIEW <view name> AS SELECT <attribute list> FROM <table(s)> WHERE <condition(s)>; The usefulness of views lies in the fact that they provide an excellent way to give people access to some but not all of the information in a table.
14	**Define the following :** **(i) Primary key** **(ii) Candidate key**

	(iii) Alternate key **(iv) Foreign key**
Ans.	**(i) Primary key**: It is a column (or columns) in a table that uniquely identifies each row. A primary key value is unique and cannot be null. There is only one primary key for a table. **(ii) Candidate key**: It is a column (or columns) that uniquely identify rows in a table. Any of the identified candidate keys can be used as the table's primary key. **(iii) Alternate key**: A candidate key that is not the primary key is called an Alternate Key. **(iv) Foreign key**: It is a column (or a set of columns) that refers to the primary key in another table i.e. it is used as a link to a matching column in another table.

Type B: Short Answer Questions

1 **Draw a diagram explaining various levels of data abstraction.**

Ans.



The Three Levels of Data Abstraction.

2 **What is meant by "data independence"? Make a list of data independence capabilities.**

Ans **Data independence** is the ability to modify a scheme definition in one level without affecting a scheme definition in a higher level.

Data independence capabilities :

- ✓ Physical Data Independence has ability to modify the scheme followed at the physical level without affecting the scheme followed at the conceptual level.
- ✓ Logical Data Independence has ability to modify the conceptual scheme without causing any changes in the schemes followed at view levels.

3 **What are the main difference between a file-processing system and a database management system?**

Ans.

File-processing system	Database management system
It has problem of data redundancy.	It can reduce data redundancy to a large extent.
Data is insecure.	Provide more security to data.
Cannot store data permanently.	Can store data permanently.
Cannot change and access file-oriented data	Can change and access data in DBMS.
Cannot recall or recover the file-oriented data	DBMS solve such type of problem

4 **This chapter has described some of the major advantage of a database system. What are the disadvantages?**

Ans. Following are disadvantage of database system :

- ✓ Security may be compromised without good controls.
- ✓ Integrity may be compromised without good controls.
- ✓ Extra hardware may be required.
- ✓ Performance overhead may be significant.
- ✓ System is likely to be complex.

5 **Explain deference between physical and logical data independence.**

Ans.

Physical data independence	Logical data independence

		Modifies the scheme followed at the physical level without affecting the scheme followed at the conceptual level.	Modifies the conceptual scheme without causing any changes in the schemes followed at view levels.
		Less difficult to achieve.	More difficult to achieve because the
		Application programs are not heavily dependent on the physical structure of the database.	Application programs are heavily dependent on the logical structure of the database.

6	**Illustrate the difference between the three levels of data abstraction.**

Ans.

Internal Level	**Conceptual Level**	**External Level**
Describes how the data is actually stored on the storage medium.	Describes what data are actually stored in the database and relationship existing among data.	Concerned with the data is viewed by individual users.
At this level, complex low-level data structure are described in details.	At this level, the database is described logically in terms of simple data-structures.	Only a part of the database relevant to the users is provided to them through this level.

7	**Summarize the major difference between a relation and a traditional file.**
Ans.	File System vs. Data base Management System: 1. Files act locally where as DBMS saves directly in a database 2. Saves in temporary locations where as DBMS in well arranged and permanent data base locations 3. In File System., transactions are not possible where as various transactions like insert, delete, view, updating etc are possible in DBMS 4. Data will be accessed through single or various files where as in DBMS, tables (schema) is used to access data. 5. A "File manager" is used to store all relationships in directories in File Systems where as a data base manager (administrator) stores the relationship in form of structural tables 6. Last.... but not the least.... Data in data bases are more secure compared to data in files!!