

**SRI SAI RAM ENGINEERING COLLEGE**  
**DEPARTMENT OF INFORMATION TECHNOLOGY**  
**III YEAR/V SEMESTER**  
**CS1301-DATABASE MANAGEMENT SYSTEM**  
**Unit-I (2 marks questions)**

**1. What is a database?**

- Data base is a collection of data.
- It contains information about one particular enterprise.

**2. What is a database management system and explain its purposes?**

- A data base management system consists of a collection of interrelated data and a set of program to access the data . the primary goal of a DBMS is to provide an environment that is both convenient and efficient to use in retrieving and storing data base information.
- data base systems are designed to manage large amount of information.

**Purpose:**

- A DBMS provides a secure and survivable medium for the storage and retrieval of data.
- In the real world, the data is shared among several users and is persistent.

**3. What are the drawbacks of conventional file processing system?**

- The drawbacks of traditional file processing system are
- Data redundancy and inconsistency
- Difficulty in accessing data
- Data isolation
- Concurrent access anomalies
- Security problems
- Integrity problems

**4. What are the advantages of data base?**

- Advantages of database are
- redundancy can be reduced
- inconsistency can be avoided
- the data can be shared
- standards can be enforced
- Security can be enforced

**5. What are the 3 levels of data abstractions?**

The 3 levels of data abstractions are

1. **Physical level:** It is the lowest level of abstraction that describes how the data are actually stored. The physical level describes complex low level data structure
2. **Logical level:** It is a next higher level of abstraction that describes what data are stored n the data base and what relationships exist among those data.
3. **View level:** It is the highest level of abstraction that describes only part of the entire data base

**6. Write a short note on DDL?**

**DDL** stands for data definition language. It is to specify the data base schema.DDL is a set of SQL commands used to create ,modify and delete data base structures but not data.

**Examples of DDL statement:**

**Create:** To create objects in the data base

**Alter:** Alter the structure of the data base

**Drop:** Deletes all the objects from the data base

**Truncate:** Removes all the records from a table, including all spaces allocated for the records are removed.

**Comment:** Add comments to the data dictionary.

**7. Write a short note on DML?**

**DML** stands for Data manipulation language .It is used for

- The retrieval of information stored in the data base
- The insertion of new information into the data base
- The deletion of information from the data base
- The modification of information stored in the data base

**8. What are the types of DML?**

The 2 types of DML are

**Procedural DML:** Require a user to specify what data are needed and how to get those data

**Declaratives DML:** Require a user to specify what data are needed without specifying how to get those data

**9. Define Schema.**

A database schema is a collection of meta-data that describes the relations in a database. A schema can be simply described as the "layout" of a database or the blueprint that outlines the way data is organized into tables

**10. What are the types of data base schema?**

The types of data base schema are

**Physical schema:** It describes the data base design at the physical level

**Logical schema:** It describes the data base design at the logical level

**Subschema:** A data base may also have several sub schemas at the view level called as Subschema's that describes different views of the data base

**11. Write a short note on storage manager?**

A storage manager is a program module that provides the interface between the low level data stored in the database and the application programs and queries submitted to the system. The storage manager translates the various DML statements into low level file system commands.

Thus, the storage manager is responsible for storing, retrieving and updating data.

**12. Name some components of storage manager?**

The various component of the storage manager are:

Authorization and integrity manager, Transaction manager, File manager, Buffer manager

Data files and Data dictionary

**13. What are the different data models?**

Different types of data models are Entity relationships model, Relational model, Hierarchical model, Object oriented model and Object relational model

**14. What is an entity?**

An entity is a 'thing', or 'object' in the real world that is distinguishable from all other objects. For examples , each person in an enterprise is an entity. An entity has a set of properties, and the values for set of properties may uniquely identity an entity. An entity may be concrete or physical. An entity set is a set of the same type that shares the same properties or attributes.

**15. What are the classifications of attributes?**

Attributes are classified as

- simple
- composite
- single valued
- multi valued
- derived

**16. What is weak entity? Give example.**

An entity whose existence in the database is dependent on the existence of another entity as these entities do not have key attributes. For example, the entity class Dependent in an employee.

**17. What are the three characteristics of relational database system?**

- It must store data as relations such that each column is independently identified by its column name and ordering of rows is immaterial.
- The operations available to the user, as well as those used internally by the system should be true relational operations; that is they should be able to generate new systems from old system.
- The system must support at least one variant of the JOIN operation.

**18. Define Relational schema and degree of relation?**

A relational schema R is denoted by  $R(A_1, A_2, \dots, A_n)$  which is used for describing a relation, where R is the name of relation,  $(A_1, A_2, \dots, A_n)$  are list of attributes that belongs to some domain D. A degree of a relation is the no. of attributes n of its relational schema.

E.g. student (name, dept, DOB, address, age)

Degree = 5

**19. Why are duplicate tuples not allowed in a relation?**

All elements in a set are always distinct; hence all tuples in a relation must also be distinct.

**20. What is a key and super key?**

- A super key specifies the uniqueness constraint that no two distinct tuples in a state of a relation can have same value.
- A key of a relation schema is a super key of relation with additional property that is removing any attribute from the key leaves a set of attributes that is not a super key.

**21. What is entity integrity constraint?**

The entity integrity constraint states that no primary key can have a null value. This is because the primary key is used to identify the individual tuples in a relation.

**22. What is referential integrity constraint?**

The referential integrity constraints is specified between two relations used and is used to maintain consistency among tuples of the two relations. That is this states that the tuple in one relation that refers to another relation must refer to the existing relation in that tuple.

**23. What is an foreign Key and rules for declaring it?**

A set of attributes FK in relational schema R1 is a foreign key of R1 that references relation R2 if it satisfies the following condition:

- The attributes in FK have same domain(s) as the primary key attributes of R2, the attributes are said to reference the relation R2.
- A value of FK in a tuple t1 of the current state r1(R1) either occurs as a value of PK for some tuple t2 in the current state r2(R2) or is null. That is  $t_1(FK) = t_2(PK)$ , tuple t1 references tuple t2. R1 is the referencing relation and R2 is the referenced relation.

**24. What is relational algebra?**

A basic set of relational model operations constitute the relational algebra. These operations enable user to specify the basic retrieval requests which result in a new relation. A sequence of relational algebra operations forms a relational algebra expression which will also result in an relation.

**25. Define select operations?**

**SELECT:** A select is used to select a subset of tuples from a relation that satisfy a selection condition.  $\sigma$  represents the select operation.

E.g.  $\sigma_{\langle \text{condition} \rangle}(\text{Relation})$

## 26. Define project operations?

**PROJECT:** A project operation selects certain columns from the table from the table and discards the other columns.  $\Pi$  represents the project operation.

E.g.  $\pi_{\langle \text{condition} \rangle}(\text{Relation})$

## 27. What is union compatibility?

Two relations  $R(A_1, A_2, \dots, A_n)$  and  $S(B_1, B_2, \dots, B_n)$  are said to be union compatible if they have the same degree  $n$ . This means that the two relations have the same attributes and that each pair of corresponding attributes have the same domain.

## 28. what are UNION, INTERSECTION and SET DIFFERENCE operations?

**UNION:** The result of this operation, denoted by  $R \cup S$ , is a relation that includes all tuples that are either in  $R$  or in  $S$  or in both  $R$  &  $S$ . Duplicate tuples are eliminated.

**INTERSECTION:** The result of this operation denoted by  $R \cap S$  is a relation that includes all tuples that are in both  $R$  and  $S$ .

**SET DIFFERENCE:** The result of this operation, denoted by  $R - S$ , is a relation that includes all tuples that are in  $R$  but not in  $S$ .

## 29. What is a JOIN operation? What are types?

- The joint operation is used to combine related tuples, from two relations into single tuple. This operation is very important for any relational database with more than a single relation, because it allows us to process relationships among relations.
- The different types are:
  - THETA Join
  - EQUI Join
  - NATURAL Join

## 30. What are Theta, Equi and Natural Join?

- **THETA JOIN:** A join operation with any one of the comparison operators i.e,  $\{=, <, >, \neq, \leq, \geq\}$  as join condition is called Theta Join.
- **EQUI JOIN:** A join that involves conditions with only equality comparison ( $=$ ) is called Equi Join.
- **NATURAL JOIN:** A standard definition for natural join requires that two join attributes (or each pair of join attributes) have the same name in both relations. It is denoted by  $*$ .

## 31. What is Outer Join?

Normally tuples with null in join attributes are eliminated. A set of operations called OUTER JOIN can be used when we want to keep all the tuples in  $R$  or those in  $S$  or those in both relations in the result of join, whether or not they have matching tuples in other tuple. Types of OUTER JOIN are:

- LEFT OUTER JOIN
- RIGHT OUTER JOIN
- FULL OUTER JOIN

## 32. Define OUTER UNION?

The OUTER UNION operation was developed to take the union of tuples from two relations if the relations are not union compatible. This will take union on two relations that are partially compatible i.e, in which only some of their attributes are union compatible.