

## ASSIGNMENT 1 (DBMS).

Q1. what is DBMS? Explain its advantages

- A Database Management System (DBMS) is defined as the software system that allows users to define, create, maintain and control access to the database. DBMS makes it possible for end users to create, read, update and delete data in database. It is a layer between data and program.

\* Advantages of DBMS:-

- data redundancy and consistency
- data sharing
- integrity restrictions
- greater security .

Q2. what is data Abstraction? Explain its levels

→ Data Abstraction refers to providing only essential information to the outside world and hiding these background details, i.e. to represent the needed information in program without presenting the details.

⇒ There are many 3 levels of data abstraction.  
Internal level:- Also known as physical level of data abstraction. It

describes how data is actually stored in database. You can get the complex data structure details at this level.

⇒ Logical level :- This is the middle level. It describes what data is stored in database.

⇒ View level :- Highest level of data abstraction. This level describes the user interaction with database system.

Q.3. Who is data Administrator? Explain the various functions of DBA.

→ Database administrators (DBAs) are individual or person responsible for controlling, maintenance and operation of database management system.

⇒ Functions of DBA:-

- Data policies, procedures, standards.
- data conflict resolution.
- Data analysis.
- Managing the data repository.

Q.4. Why data models are used in database? Explain its components.

→ Data models define how the logical structure of a database is modeled. Data models are fundamental entities to introduce abstraction in RDBMS. Data models define how data is connected to each other and how they are processed and stored inside the system.

⇒ Components of Database model

- Data set:- It contains logic to retrieve data from a single data source. A data set can retrieve data from a variety of data sources.
- Event-triggers:- A trigger checks for an event. When the event occurs the trigger runs the PL/SQL code associated with it.
- Flex fields:- It uses structure specific to oracle application.

Q.5. Define:- Entity, attribute, relationships, tuple, degree, cardinality.

- Entity:- An entity can be a real-world object, either animate or inanimate, that can be easily identifiable.
- Attribute:- It describes the characteristics or properties of an entity in a database table. Attribute values describes the members of the entity. An attribute can be used to describe a leaf member, a consolidate member, or a collection.
- Relationship:- A relationship in DBMS is primarily the way two or more data sets are linked. In context of databases is a situation that exists between two relational database tables when one table has a foreign key that makes the primary key of the other table. They allow relational databases to split and store data in different tables while linking disparate data items.

- Tuple :- A single row of a table, which contains a single record for that relation is called a Tuple. A finite set of tuples in the relational database system represents relation instance. Relation instances do not have duplicate tuples.
- Degree :- The degree of a relationship is the number of entity types that participate in a relationship. By seeing an E-R diagram we can tell degree of a relationship as the number of an entity type that is connected to a relationship is the degree of that relationship.
- Cardinality - Term cardinality refers to the uniqueness of data values contained in a particular column of a database table. The lower the cardinality the more duplicate elements in a column.

Q.6. Write a note on following :-

(as Primary key)

- A primary key is a special relational database table designated to uniquely identify all table records.

- A primary key's main features are:-
  - It must contain a unique value for each row of data.
  - It cannot contain null values.
- A primary key is either existing table column or a column that is specifically generated by the database according to a defined sequence.
- For example, students are uniquely assigned unique identification numbers and all adults receive government and uniquely-identifiable social security numbers.

(b) Alternate key :- An alternate key is a secondary candidate key that is capable of identifying a row uniquely. However, such a key is not used as a primary key because, as we have discussed in our previous section that out of all the generated candidate keys, only one key is selected as the primary key. Thus, the other remaining keys are known as Alternate keys or secondary keys.

An alternate key is none other than a candidate key, so the use/more of an alternate key is the same. It means an alternate key is also used to identify those columns in a table that can uniquely identify all the records of the table.

(c) Candidate key: Candidate key is a set of attributes that uniquely identify tuples in a table. Candidate key is a super key with no repeated attributes. The primary key should be selected from the candidate key. Every table must have at least a single candidate key. A table can have multiple candidate keys but only a single primary key.

Properties of candidate key:-

- It must contain unique values.
- Candidate key may have multiple attributes.
- Must not contain null values.
- It should contain minimum fields to ensure uniqueness.
- Uniquely identify each record in a table.

(d) Attribute and its types:- A real world property of an entity type is called an Attribute. This is the characteristics of an entity. It is represented by an oval or ellipse. Each attribute can take only a set of permitted values. This is called the domain of that attribute.

### Types of attributes:-

- Simple Attribute & composite Attribute:-  
Simple attribute contains atomic values which cannot be further divided, whereas composite attributes can be further divided into other attributes.
- Single valued Attribute & Multi-valued Attribute  
This division is made on the basis of how many values can be taken by the attribute. If the attribute can take more than one value, it is a multi-valued attribute. If the attribute takes only one value it is a single valued attribute.

- Stored Attribute & Derived Attribute:-

This classification is made on the basis of that if the attribute is just stored in the database or can be derived from some other attribute

- key Attribute & Non-key Attribute:-

This classification is used to uniquely identify the entities of an entity type. In a relational, as the name suggests key attribute will uniquely identify the entities whereas the non-key attributes would not be able to uniquely identify the entities.

(e) Strong Entity:- A strong entity has a primary key. The strong entity is independent of any other entity in a schema. Strong entity is denoted by a single rectangle. The relation between two strong entity is denoted by a single diamond simply called relationship. Strong entity may or may not have total participation in the relationship. The strong entity is the one whose existence does not depend on the existence of any other entity in a schema.

Set of similar types of strong entities together forms the strong entity set.

### (f) Generalization:

- Generalization is like a bottom up approach in which two or more entities of lower level combine to form a higher level entity if they have some attributes in common.
- In generalization, an entity of a higher level can also combine with the entities of the lower level to form a further higher level entity.
- Generalization is more like subclass and superclass system, but the only difference is the approach. Generalization uses the bottom - up approach.
- In generalization, entities are combined to form a more generalized entry; i.e. subclasses are combined to make a superclass.

### (g) Specialization:

- Specialization is a top-down approach, and it is opposite to Generalization. In specialization, one higher level entity can be broken down into two lower level entities.
- Specialization is used to identify the subset of an entity set that shares some distinguishing characteristics.
- Normally, the superclass is defined first, the subclass and its related attributes are defined next, and relationship set are then added.

Q1. Explain Relationship and its types.

→ Any Association between two entity types is called a relationship. Entities take part in the relationship. It is represented by a diamond shape.

Types of Relationships -

- o One-to-One Relationship: Such a relationship exists when each record of one table is related to only one record of the other table.
- o One-to-Many or Many-to-One: Such a relationship exists when each record of one table can be related to one or more than one record of the other table. This relationship is the most common relationship found. A one-to-many relationship can also be said as a many-to-one relationship depending upon the way we view it.
- o Many-to-Many Relationship: Such a relationship exists where each record of the first table can be related to one or more than one record of the second table and a single record of the second table can be related to one record on the first table. A many-to-many relationship can be seen as a two one-to-one many relationship which is linked by 'linking table' or 'associate table'. The linking table links two

tables by having fields which are the primary key of the other two tables. We can understand this with examples.

### Q.8. Explain DDL and DML commands.

→ DDL :- Data definition Language.  
It actually (commands) consists of the SQL commands that can be used to define the database schema. It simply deals with descriptions of the database schema and is used to create and modify the structure of database.

Ex. of DDL commands:-

- CREATE :- used to create the database or its objects.
- DROP :- is used to create delete objects from the database.
- ALTER :- used to alter the structure of database.
- TRUNCATE :- used to remove all records from a table, include all spaces allocated for the records are ignored.
- COMMENT :- is used to add comments to the data dictionary.
- RENAME :- used to rename an object existing in the database.

→ DML :- (Data Manipulation Language):-  
The SQL commands that deals with the manipulation of data present in the database belong to DML or data manipulation Language and this includes most of the SQL statements.

Examples of DML :-

- INSERT :- used to insert data into a table
- UPDATE :- is used to update existing data within a table
- DELETE :- is used to delete records from a database table.