

### **3. INTRODUCTION TO DATABASE MANAGEMENT SYSTEM**

#### **Choose the Correct Answers**

1. Which language is used to request information from a Database? c) Query
2. The \_\_\_\_\_ diagram gives a logical structure of the database graphically? A) Entity-Relationship
3. An entity set that does not have enough attributes to form primary key is known as == b) Weak entity set
4. \_\_\_\_ Command is used to delete a database. == a) drop database database\_name
5. Which type of below DBMS is MySQL? c) Relational
6. MySQL is freely available and is open source. A) True
7. \_\_\_\_\_ represents a “tuple” in a relational database? b) Row
8. Communication is established with MySQL using a) SQL
9. Which is the MySQL instance responsible for data processing? c) SQL
10. The structure representing the organizational view of entire database is known as \_\_\_\_ in Mysql database. == a) schema
11. \_\_\_\_ is the key of relational table in unique way. (primary key)
12. \_\_\_\_ is referred in a table, which are composed of fields. (record)
13. \_\_\_\_ is the system software for creating and managing database.(DBMS)
14. Related data storing them under one group name is called table.
15. Same data is used by multiple resources is called data duplication.
16. Atomicity – means update the db.
17. Consistency – means successful transaction
18. Isolation – means multiple successful transaction
19. Durability – means recover from failure data.
20. The first developed network data model was IDL.
21. Schema defines all about the structure of the database.
22. Every tuple in the relation from every other one is known as super key.
23. A foreign key is a copy of primary key.
24. A key with more than one attribute to identify rows uniquely in a table is called composite key.
25. A strong entity have a primary key.
26. A weak entity doesn't have any primary key.
27. Only one value for the attribute and they called as single attributes.
28. More than one value for the attribute and they called as multi attributes.
29. Join retrieves data from two or more tables.
30. A single entry in a table is called as row



### 1. Define Data Model and list the types of data model used.

A **data model** is an abstract model that organizes elements of data and standardizes how they relate to one another and to properties of the real world entities. The various types of data models are

- Hierarchical Database Model
- Network model
- Relational model
- Object-oriented database model

### 2. List few disadvantages of file processing system.

**Data Duplication** - Same data is used by multiple resources for processing, thus created multiple copies of same data wasting the spaces.

**High Maintenance** - Access control and verifying data consistency needs high-maintenance cost.

**Security** - Less security provided to the data.

### 3. Define Single and multi valued attributes.

A single valued attribute contains only one value for the attribute and they don't have multiple numbers of values.

A multi valued attribute has more than one value for that particular attribute.

### 4. List any two DDL and DML commands with its Syntax.

#### DDL Commands:

Commands	Syntax
CREATE	CREATE database databasename
DROP	DROP database databasename

#### DML Commands:

Commands	Syntax
INSERT	INSERT INTO tablename VALUES (value1, value2, value3);
DELETE	DELETE from tablename WHERE columnname="value";



**5. What are the ACID properties?**

Atomicity  
Consistency  
Isolation  
Durability.

**6. Which command is used to make permanent changes done by a transaction?**

COMMIT, ROLLBACK, SET TRANSACTION and SAVEPOINT commands are used to make permanent changes done by a transaction

**7. What is view in SQL?**

A set of stored queries is known as view in SQL.

**8. Write the difference between SQL and MySQL.**

SQL	MySQL
SQL is a query language.	MySQL is database software.
To query and operate database system.	Allows data handling, storing, modifying, deleting in a tabular format.

**9. What is Relationship and List its types.**

There exists a relationship between two tables when the foreign key of one table references primary key of other table.

One-to-One relationship

One-to-Many relationship

Many-to-Many relationship

**10. State few advantages of Relational databases.**

The DBMS provides users and programmers with a systematic way to create, retrieve, update and manage data.



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## 1. Explain on Evolution of DBMS.

The concept of storing the data started before 40 years in various formats. In earlier days they have used punched card technology to store the data. Then files were used. The file systems were known as predecessor of database system. Various access methods in file system were indexed, random and sequential access. The file system had more limitations like

Data Duplication  
High Maintenance  
Security.

## 2. What is relationship in databases? List its types.

There exists a relationship between two tables when the foreign key of one table references primary key of other table. The Entity- Relationship(ER) diagram is based on the three types listed below.

One-to-One relationship  
One-to-Many relationship  
Many-to-Many relationship

## 3. Discuss on Cardinality in DBMS.

Cardinality in DBMS is defined as the number of different values in any given table column. It is defined as the number of items that must be included in a relationship. ie) number of entities in one set mapped with the number of entities of another set via the relationship. Three classifications in Cardinality are

one-to-one  
one-to-many  
Many-to-Many.

## 4. List any 5 privileges available in MySQL for the User.

Select_priv	User can select rows from database tables.
Insert_priv	User can insert rows into database tables.
Update_priv	User can update rows of database tables.
Delete_priv	User can delete rows of database tables.
Create_priv	User can create new tables in database



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5. Write few commands used by DBA to control the entire database.

**USE Database** This command is used to select the database in MySQL for working.

Syntax: **mysql>use test;**

**SHOW Databases** Lists all the databases available in the database server.

Syntax: **mysql>show databases;**

**SHOW Tables** Lists all the tables available in the current database we are working in.

Syntax: **mysql>show tables;**

## PART IV

### Explain in Detail

#### 1. Discuss on various database models available in DBMS.

The major database models are listed below:

Hierarchical Database Model

Network model

Relational model

Object-oriented database model

##### **Hierarchical Database Model**

In this model each record has information in parent/child relationship like a tree structure. The collection of records was called as record types, which are equivalent to tables in relational model. The individual records are equal to rows. The famous Hierarchical database model was IMS (Information Management System), IBM's first DBMS.

##### **Advantages:**

Less redundant data

Efficient search

Data integrity

Security

##### **Limitations:**

Complex to implement and difficulty in handling

Many to many relationships.

##### **Network model**

Network model is similar to Hierarchical model except that in this model each member can have more than one owner. The many to many relationships are handled in a better way. This model identified the three database components Network schema - Defines all about the structure of database.



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Sub schema - Controls on views of the database for the user.

Language for data management - Basic procedural for accessing the database.

### **Relational model:**

Oracle and DB2 are few commercial relational models in use.

Relational model is defined with two terminologies Instance and Schema.

**Instance** – A table consisting of rows and columns

**Schema** – Specifies the structure including name and type of each column.

A relation (table) consists of unique attributes (columns) and tuples (rows).

This model incorporates the combination of Object Oriented

Programming(OOP's) concepts and database technologies.

Practically, this model serves as the base of Relational model.

Object oriented model uses small, reusable software known as Objects.

These are stored in object oriented database.

This model efficiently manages large number of different data types.

Moreover complex behaviors are handled efficiently using OOP's concepts.

## **2. List the basic concepts of ER Model with suitable example.**

The basic concepts of ER model consists of

Entity or Entity type

Attributes

Relationship

These are the general concepts which help to create an ER diagram and produce an ER model.

### **Entity or Entity type**

An Entity can be anything a real-world object or animation which is easily identifiable by anyone even by a common man.

Example: In a company's database Employee, HR, Manager are considered as entities. An entity is represented by a rectangular box.

### **Types of Entity:**

1. Strong Entity

2. Weak Entity

3. Entity Instance

### **Strong Entity**

A Strong entity is the one which doesn't depend on any other entity on the schema or database .A strong entity will have a primary key with it. It is represented by one rectangle.

### **Weak Entity**

A weak entity is dependent on other entities and it doesn't have any primary key like the Strong entity.



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It is represented by double rectangle.

### **Entity Instance**

Instances are the values for the entity if we consider animals as the entity their instances will be dog, cat, cow... Etc. So an Entity Instance denotes the category values for the given entity.

### **Attributes:**

An attribute is the information about that entity and it will describe, quantify, classify, and specify an entity.

An attribute will always have a single value, that value can be a number or character or string.

### **Types of attributes:**

1. Key Attribute
2. Simple Attributes
3. Composite Attributes
4. Single Valued Attribute
5. Multi Valued Attribute

### **Relationship:**

There exists a relationship between two tables when the foreign key of one table references primary key of other table.

The Entity- Relationship(ER) diagram is based on the three types listed below.

- One-to-One relationship
- One-to-Many relationship
- Many-to-Many relationship

### **3. Discuss in detail on various types of attributes in DBMS.**

### **Types of attributes:**

#### **1. Key Attribute:**

Generally a key attribute describes a unique characteristic of an entity.

#### **2. Simple Attribute:**

The simple attributes cannot be separated it will be having a single value for their entity.

For Example: Let us consider the name as the attribute for the entity employee and here the value for that attribute is a single value.



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### **3. Composite Attributes:**

The composite attributes can be subdivided into simple attributes without change in the meaning of that attribute.

For Example: In the above diagram the employee is the entity with the composite attribute Name which are sub-divided into two simple attributes first and last name.

### **4. Single Valued Attributes:**

A single valued attribute contains only one value for the attribute and they don't have multiple numbers of values.

For Example: Age- It is a single value for a person as we cannot give n number of ages for a single person; therefore it is a single valued attribute.

### **5. Multi Valued Attributes:**

A multi valued attribute has more than one value for that particular attribute.

For Example: Degree - A person can hold n number of degrees so it is a multi-valued attribute.

## **4. Write a note on open source software tools available in MySQL Administration.**

MySQL is open source software that allows managing relational databases.

It also provides the flexibility of changing the source code as per the needs.

It runs on multiple platforms like Windows, Linux and is scalable, reliable and fast.

### **PHPMYADMIN (Web Admin)**

This administrative tool of MySQL is a web application written in PHP. They are used predominantly in web hosting.

The main feature is providing web interface, importing data from CSV and exporting data to various formats.

It generates live charts for monitoring MySQL server activities like connections, processes and memory usage. It also helps in making the complex queries easier.

### **MySQL Workbench (Desktop Application)**

It is a database tool used by developers and DBA's mainly for visualization.

This tool helps in data modeling, development of SQL, server configuration and backup for MySQL in a better way.

Its basic release version is 5.0 and is now in 8.0 supporting all Operating Systems.



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The SQL editor of this tool is very flexible and comfortable in dealing multiple results set.

### **Heidi SQL (Desktop Application)**

This open source tool helps in the administration of better database systems. It supports GUI (Graphical User Interface) features for monitoring server host, server connection, Databases, Tables, Views, Triggers and Events.

### **5. Explain in detail on Sub Queries with suitable examples.**

The SQL query is written within a main Query. This is called as Nested Inner/Sub Query. The sub query is executed first and the results of sub query are used as the condition for main query.

#### **The sub query must follow the below rules:**

1. Subqueries are always written within the parentheses.
2. Always place the Subquery on the right side of the comparison operator.
3. ORDER BY clause is not used in sub query, since Subqueries cannot manipulate the results internally.

**Example:** (Consider the **Employee** table with the fields EmpID, Name, Age and Salary.)

```
SELECT * from Employee where EmpID IN (SELECT EmpID from Employee  
WHERE Salary < 20000);
```

First, the inner query is executed. Then outer query will be executed.



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