CHAPTER - 3

INTRODUCTION TO DATABASE MANAGEMENT SYSTEM

PART I

Choose the Correct Answers

1. Which language is used to request

information from a Database?

a) Relational b) Structural

c) Query d) Compiler

2. The _____ diagram gives a logicalstructure

of the database graphically?

a) Entity-Relationship b) Entity

c) Architectural Representation d) Database

3. An entity set that does not have enough

attributes to form primary key is known as

a) Strong entity set b) Weak entity set

c) Identity set d) Owner set

4. _____ Command is used to delete a database.

a) Delete database database_name

b) Delete database_name

c) drop database database_name

d) drop database_name

5. Which type of below DBMS is MySQL?

a) Object Oriented b) Hierarchical

c) Relational d) Network

6. MySQL is freely available and is open source

a) True b) False

7. _____ represents a “tuple” in a relational database?

a) Table b) Row

c) Column d) Object

8. Communication is established with MySQL using

a) SQL b) Network calls

c) Java d) API’s

9. Which is the MySQL instance responsible for data processing?

a) MySQL Client b) MySQL Server

c) SQL d) Server Daemon Program

10. The structure representing the organizational view of entire database is known as ____ in MySQL database.

a) Schema b) View

c) Instance d) Table

ANSWERS FOR OBJECTIVES

1. c 2. a 3. b 4. c 5. c 6. a 7. b 8. a 9. c 10. a

PART III

Short Answers

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

Hierarchical Database Model

Network model

Relational model

Object-oriented database model

2. List few disadvantages of file processing system.

Data Duplication - Same data is usedby multiple

resources for processing, thus

created multiple copies of same datawasting the spaces.

High Maintenance - Access control andverifying

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?

These SQL commands manage thetransactions

in SQL databases.

It alsohelps to save the change into

databasepermanently.

COMMIT, ROLLBACK,SET TRANSACTION and

SAVEPOINTcommands belongs to this category.

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.

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."

PART IIII

Explain in Brief Answer

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.

Variousaccess methods in file system were indexed, random and sequential access.The file system had more limitations like Data Duplication,High Maintenance, and Security.

• 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. So database systems became popular to overcome the above limitations of file system.

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.

It 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 and Many-to-Many.

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

Privileges Action Performed (If Granted)

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

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 toHierarchical model

except that in thismodel each member can have more thanone owner.

The many to many relationshipsare handled in a better way.

This modelidentified the three database components

• Network schema - Defines all about the structure of database

• 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)

Object-oriented database model

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.

• 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 val-

ues 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.

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 aweb

application written in PHP. They areused predominantly in web hosting.

Themain feature is providing web interface,- importing data from CSV and exportingdata to various formats.

It generates livecharts for monitoring MySQL serveractivities like connections, processes andmemory usage. It also helps in making thecomplex queries easier.

MySQL Workbench (DesktopApplication)

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

This toolhelps in data modeling, development of SQL,server configuration and backup for MySQLin a better way.

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

The SQL editor of this tool is veryflexible and comfortable in dealing multipleresults set.HeidiSQL (Desktop Application)

This open source tools helps in theadministration of better database systems.

It supports GUI (Graphical User Interface) features for monitoring server host, servercon- nection, Databases, Tables, Views,Triggers and Events.

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

The SQL query is written within amain Query.

This is called as Nested Inner/SubQuery.

The sub query is executed firstand the results of sub query are used as thecondition for main query.

The sub querymust follow the below rules:

1. Subqueries are always written withinthe

parentheses.

2. Always place the Subquery on theright side of

the comparison operator.

3. ORDER BY clause is not used insub query,

since Subqueries cannotmanipulate the results

internally.

Example: (Consider the Employee tablewith the

fields EmpID, Name, Age andSalary.)

SELECT * from Employeewhere EmpID IN (SELECT

EmpID fromEmployee WHERE Salary < 20000);

First, the inner query is executed. Then outer query

will be executed.

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