15. Compare HTML and XML briefly

Ans. - HTML versus XML

	HTML	XML
1	HTML document formats and displays	XML documents carry data along with their
2	HTML tags are predefined	New tags can be created as per our
3	HTML may not have closing tags.	XML must have closing tags.
4	HTML tags are not case sensitive	XML tags are case sensitive.
5	HTML documents are directly viewable in a browser.	XML documents are viewed only if proper style sheet file is also available along with

16. Describe features of XML

Ans. - Features of XML:

1. XML is designed to carry data not to display data.

2. XML was created to structure, store and to send information.

3. XML is self-descriptive. Tags are not pre-defined; rather they are created to describe the content in appropriate manner.

4. XML is free and extensible.

5. XML is platform independent.

6. XML can separate Data from HTML. XML stores and describes data, which can later be formatted and presented in desired way.

7. XML can be used to create new languages, since it is a Meta language.

8. XML is supported and recommended by World Wide Web Consortium (W3C).

CHAPTER 14

MYSQL REVISION TOUR

Brief Summary of the Chapter:

A database system is basically a computer based record keeping system. There are different data models are available. The most popular data model is Relational Data Model (RDBMS). In RDBMS data is arranged in the form of table. MYSQL is software to manipulate database. It is free, open-source RDBMS. In order to access data within MYSQL database, all programs and users must use, Structured Query Language (SQL).SQL is the set of commands that is recognized by nearly all RDBMs. SQL commands can be classified into three categories. These are DDL (Data Definition Language), DML (Data Manipulations Language) and TCL (Transmission Control Language). Apart from MYSQL is commands, it has various functions that performs some operation and returns a single

value. In this chapter we will learn various commands and functions in MYSQL and its implementation.

KEY POINTS OF THE CHAPTER

- **Structure Query Language**
  A non-procedural UGL used for querying upon relational database

- **DDL: Data Definition Language**
  Part of the SQL that facilitates defining creation/modification etc. of database object such as tables, indexes, sequences etc.

- **DML: Data Manipulation Language**.
  Part of the SQL that facilitates manipulation (additions/deletions/modification) of data which residing in the database tables.

- **Meta Data**
  Facts/data about the data stored in table.

- **Data Dictionary**
  A file containing facts/data about the data stored in table

- **Relational Data Model**
  In this model data is organized into tables i.e. rows and columns. These tables are called relations.

- **The Network Data Model**
  In this model data are represented by collection of records & relationships among data. The collections of records are connected to one another by means of links.

- **The Hierarchical Data Model**
  In this model records are organized as trees rather than arbitrary graphs.

- **Object Oriented Data Model**
  Data and associated operations are represented by objects. An object is an identifiable entity with some characteristics and behavior.

- **Relation:**
  Table in Database

- **Domain:**
  Pool of values from which the actual values appearing

- **Tuple:**
  A row of a relation

- **Attribute:**
  A column of relation

- **Degree:**
  Number of attributes

- **Cardinality:**
  Number of tuples

- **View:**
  Virtual table that does not really exist in its own right

- **Primary Key:**
  Set of one or more attributes that can uniquely identify tuples with in the relation.

- **Candidate Key:**
  A Candidate Key is the one that is capable of becoming Primary key i.e., a field or attribute that has unique value for each row in the relation.

- **Alternate Key:**
  A candidate key that is not primary key is called alternate key.

- **Foreign Key:**
  A non-key attribute, whose values are derived from the primary key of some other table.

- **Integrity Constraints**
  Integrity Constraints are the rules that a database must comply all the times. It determines what all changes are permissible to a database.

- **Accessing Database in MySql :**

Through USE keyword we can start any database
Syntax:
USE <database Name>;
Example: USE STUDENT;

- **CREATING TABLE IN MYSQL**
  Through Create table command we can define any table.
  CREATE TABLE <tablename>
  (<columnname> <datatype>[(<Size>)],……..);
  CREATE TABLE Student(SRollNo integer, Sname char(20));

- **INSERTING DATA INTO TABLE**
  The rows are added to relations using INSERT command.
  INSERT INTO <tablename>[<columnname>]
  VALUES (<value>, <value>…);
  INSERT INTO student (Sid, Sname)
  VALUES (100,'ABC');

- **SELECT COMMAND:**
  It lets us make queries on the database.
  SELECT * FROM tablename WHERE condition;
  SELECT * FROM student WHERE Sid=100;

- **Eliminating Redundant Data**
  DISTINCT keyword eliminates redundant data
  SELECT DISTINCT Sid FROM Student;

- **Selecting from all the rows-ALL Keyword**
  SELECt ALL Sid FROM Student;

- **Viewing structure of table:**
  DESCRIBE/DESC <tablename>;
  DESCRIBE student;
  Using column aliases:
  SELECT <column name> AS [columnalias][,…]
  FROM <tablename>;
  SELECT rollno, name AS "studentname"
  FROM student;

- **Condition based on a range:**
  Keyword BETWEEN used for making range checks in queries.
  SELECT rollno, name FROM student WHERE rollno BETWEEN 10 AND 20;
- **Condition based on a list:**
  Keyword IN used for selecting values from a list of values.
  SELECT rollno, name FROM student WHERE rollno IN (10, 20, 60);
- **Condition based on a pattern matches:**
  Keyword LIKE used for making character comparison using strings
  percent(%) matches any substring
  underscore(_) matches any character
  SELECT rollno, name FROM student WHERE name LIKE '%ri';
- **ORDER BY clause:**
  It is used to sort the results of a query.
  SELECT <column name> [, <column name>, …]
  FROM <table name>
  [WHERE <condition>]

[ORDER BY <column name>];
SELECT *
FROM student
WHERE marks>50
ORDER BY name;

- **MySQL functions:**
  A function is a special type of predefined command set that performs some operation and returns a single value.
  String functions :(Lower / LCASE( ), Upper/UCASE( ), Concate( ), Instr( ), Length( ), RTrim( ), LTrim( ), Substr( ))
  Numeric function :(Round( ), Truncate( ), Mod( ), Sign( ))
  3.Date functions:(Curdate( ), Date( ), Month( ), year( ), DayName( ), DayofMonth( ), DayofWeek( ), DayofYear( ), Now( ), SysDate( ))

- **Creating tables with SQL Constraint :**
  CREATE TABLE command is used to CREATE tables
  CREATE TABLE tablename
  (columnname datatype size, …);

- **SQL Constraint:**
  A Constraint is a condition or check applicable on a field or set of fields.

- **NOT NULL/UNIQUE/DEFAULT/CHECK/PRIMARY KEY/FOREIGN KEY Constraint:**

  CREATE TABLE student (Srollno integer NOT NULL, …);

  CREATE TABLE student (Srollno integer UNIQUE …);

  CREATE TABLE student (Srollno integer NOT NULL, Sclass integer, Sname varchar(30), Sclass DEFAULT 12);

  CREATE TABLE student (Srollno integer CHECK (Srollno>0), Sclass integer, Sname varchar(30));

  CREATE TABLE student (Srollno integer NOT NULL PRIMARY KEY, Sclass integer, Sname varchar(30));

  CREATE TABLE teacher (Tid integer NOT NULL, FOREIGN KEY (Studentid) REFRENCES student (Sid));

- **Inserting data into table:**
  INSERT INTO command is used to insert data into table

  INSERT INTO tablename VALUES (value1,….);

  INSERT INTO student VALUES (1,'Ram', 12);

- **Modifying data in tables:**
  Existing data in tables can be changed with UPDATE command.

  UPDATE student SET Sclass=11 WHERE Sname='Ram';

- **Deleting data from tables:**
  Tuples in a table can be deleted using DELETE command.

DELETE FROM student WHERE Srollno>10;

SOLVED QUESTIONS

1. **What do you mean by a Database Management System?**

   Ans- Database Management is a collection of programs and files that allow a user to define structure of a database, store data into it, modify the structure and manipulate the data.

2. **What do you mean by Relational database?**

   Ans-Relational Database is a type of database in which relation is used as its basic element.Row and columns are used to store data.

3. **What is a foreign key?**

   Ans If a key is available in a table as a primary key then this key is called foreign key in another table.

4. **What is primary key?**

   Ans-Primary key is a unique key in a relation which can uniquely identifies a tuple (row) in a given relation.

5. **What is SQL?**

   Ans-SQL is stands for structured query language. This language is used to manipulate data stored in a table.

6. **What is referential integrity?**

   Ans-This is a rule which ensures that in DBMS relationships between records in related tables are valid. And that user don't accidently delete or change related data.

7. **What is MySql?**

   Ans-Mysql is an open source RDBMS which uses SQL.

8. **What is DDL?**

   Ans- DDL provides commands to define or redefine the schema of a table.Table is created,altered and dropped using DDL.

9. **What are DML commands?**

   Ans- DML commands are used to manipulate data stored in a table.Insertion, deletion and modifications are possible using DML commands.

10. **Maximum how many characters can be stored in a (i) text literals (ii) numeric literal**

    Ans-(i) Text literals can have 4000 bytes (ii) A numeric literals can store 53 digits.

11. **What is null value in MySql?**

    Ans-If a column in a row has no value, then column is said to be null.

12. **Which keyword eliminates redundant data in from a query result?**

    Ans- DISTINCT

13. **How would you display system date as the result of a query?**

Ans- CURDATE()

14. What is NOW() function in MySql?

Ans- It returns the current date and time.

15. What is NOT NULL constraint?

Ans- NOT NULL constraints impose a condition that value of a row cannot be left blank.

16. What is error in following statement?

UPDATE EMPL;

Ans- WHERE clause is missing in given query.

17. Identify the error?

DELETE ALL FROM TABLE EMP;

Ans-There is no need to write ALL and TABLE word in above query.

Correct form is-DELETE FROM EMP;

18. Differeniate WHERE and HAVING clause?

Ans-:- Where clause is used to select particular rows that satisfy condition whereas having clause is used in connection with aggregate function, group by clause.

19. How SQL commands are are classified?

Ans-SQL Commands are classified into three categories

(i)Data Definition Language (DDL)-Commands that allow us to perform tasks related to data definition. E.g. creating, altering and dropping

(ii) Data Manipulation Language (DML) - Commands that allows us to perform data manipulation e.g retrieval, insertion, and modification of data stored in a database.

(iii) Transaction Control Language (TCL)-Commands that allow us to manage and control the transactions.

20. What is difference between char and varchar?

Ans-The difference between char and varchar is that of fixed length and variable length.The CHAR datatypes specifies a fixed length character string.When a column is given datatype as CHAR(n) then MySQL ensures that all values stored in that column have this length.But on other hand when a column is given datatype as VARCHAR(n) ,then the maximum size of a value in this column stores exactly what we specify.

21. What do you understand by the terms primary key and degree of a relation in relational data base?

Ans: Primary Key: A primary key is a set of one or more attributes that can   uniquely identify tuples within the relations. The number of attributes in a relation is called Degree of arelation in relational data base.

22. What do you understand by the candidate key and cardinality of a relation in relational data base?

Candidate Key: All attribute combinations inside a relation that can serve as primary key(uniquely identifies a row in a relation) are Candidate Keys as they are candidates for the primary key position. The number of rows in a relation is known as cardinality of a relation.

23. Consider the following tables Item and Customer. Write SQL commands for the statement (i) to (iv) and give outputs for SQL queries (v) to (viii)

Table: **ITEM**

S.no	I_ID	Item Name	Manufacturer Price
01	PC01	Personal Computer	ABC 35000
02	LC05	Laptop	ABC 55000
03	PC03	Personal Computer	XYZ 32000
04	PC06	Personal Computer	COMP 37000
05	LC03	Laptop	PQR 57000

Table: CUSTOMER C_ID Customer Name City I_ID

S.no	CUSTOMER C_ID	Customer Name	City	I_ID
01	01	**N.Roy**	Delhi	LC03
02	06	**H.Singh**	Mumbai	PC03
03	12	**R.Pandey**	Delhi	PC06
04	15	**C.Sharma**	Delhi	LC03
05	16	**K.Agrawal**	Bangalore	PC01

(i) To display the details of those Customers whose city is Delhi

.**Ans:** Select all from Customer Where City="Delhi"

(ii)To display the details of Item whose Price is in the range of 35000 to 55000 (Both values included).

Ans: Select all from Item Where Price>=35000 and Price <=55000

(iii)To display the Customer Name, City from table Customer, and Item Name and Price from table Item, with their correspondingmatching I_ID.

Ans: Select Customer Name, City, ItemName, Price from Item, Customer where Item.I_ID=Customer.I_ID.

(iv) To increase the Price of all Items by 1000 in the table Item.

Ans: Update Item set Price=Price+1000

(v)SELECT DISTINCT City FROM Customer.

Ans: City Delhi, Mumbai, Bangalore

(vi)SELECT Item Name, MAX(Price), Count(*) FROM Item GROUP BY Item Name;

Ans: **Item Name Max(Price) Count(*)** Personal Computer 37000 3 Laptop 57000 2

(vii)SELECT Customer Name, Manufacturer FROM Item, Customer WHERE Item.Item_Id=Customer.Item_Id;

Ans: Customer Name Manufacturer Name

N.Roy PQR

H.Singh XYZ

R.Pandey COMP

C.Sharma PQR

K.Agrawal ABC

(viii)SELECT Item Name, Price * 100 FROM Item WHERE

Manufacturer = 'ABC';

Ans: Item Name Price*100 Personal Computer 3500000
Laptop 5500000

UNSOLVED QUESTIONS

1. Write MySql command that will be used to show all the databases which is already created in MySql.
2. The Department column and date of joining of a table Employee is given below:

Department	Date_of_Joining
Biology	2009-07-19
Zoology	2007-02-13
Bio_Tech	2010-05-15
Psycology	2011-09-06

(i) Based on the above table write SQL Query to display the name of those departments whose name ends with logy?

(ii) Based on the above table write SQL Query to display the name of those departments whose name starts with Bi.

3. What is the degree and cardinality of the above given Employee table?
4. Differentiate between Primary key and Unique Key?
5. Consider the following tables WORKERS and DESIG. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii).

WORKERS

W_ID	FIRSTNAME	LASTNAME	ADDRESS CITY
102	Sam	Tones	33 Elm St. Paris
105	Sarah	Ackerman	44 U.S.110 New York
144	Manila	Sengupta	24 Friends Street New Delhi
210	George	Smith	83 First Street Howard
255	Mary	Jones	842 Vine Ave. Losantiville
300	Robert	Samuel	9 Fifth Cross Washington
335	Henry	Williams	12 Moore Street Boston
403	Ronny	Lee	121 Harrison St. Newyork
451	Pat	Thompson	11 Red Road Pari

DESIG

W_ID	SALARY	BENEFITS	DESIGINATION
102	75000	15000	Manager
105	85000	25000	Director
144	70000	15000	Manager
210	75000	12500	Manager
255	50000	12000	Clerk
300	45000	10000	Clerk
335	40000	10000	Clerk
400	32000	7500	Salesman
451	28000	7500	Salesman

(i) To display W_ID First name, address and City of all employees living in New York from the Table Workers

(ii) To display the content of workers table in ascending order of LASTNAME.

(iii) To display the FIRSTNAME, LASTNAME and Total Salary of all Clerks from the tables WORKERS And DESIG, where Total alary is calculated as Salary + benefits.

(iv) To display the minimum salary among managers and Clerks From the tables DESIG.

(v) SELECT FIRSTNAME, SALARY ROM WORKERS, DESIG WHERE DESIGINATION = "MANAGER" AND ORKERS.W_ID = DESIGN.W_ID

(vi)SELECT COUNT(DISTINCT DESIGNATION) FROM DESIGN ;

(vii) SELECT DESIGNATION, SUM(SALARY) ROM DESIG GROUP BY DESIGNATION HAVING COUNT (*) < 3;

(viii) SELECT SUM(BENIFTS) FROM DESIG HERE DESIGINATION ="salesman";

CHAPTER -15

DATABASE TRANSACTIONS

Brief Summary of the Chapter:

Reliability is a quality, which we seek for in everything that we get. The same is applicable to software and to database. A reliable database system is that which retains our database in a consistent state despite occurrence of many failures. Database Transaction is the field which requires utmost consistency. This chapter describes fundamentals of database transactions and its reliable implementation. A database can be called consistent when it follows ACID properties. A transactions can be called reliable when it either COMMITed i.e. successfully all its steps are carried out and changes are permanently reflected in the database or be ROLLBACKed i.e. in case of failures, if transaction cannot be successfully completed then any data changes made by the transaction are brought back to the state that earlier was prior to the execution of this transaction.

KEY POINTS OF THE CHAPTER

TRANSACTION-A set of successive statements that succeed or fail as a group so that all effected statements of the group are retained or all are discarded are called transactions. When a transaction is done on the database is called **database transaction**.

COMMIT-This statement is used to end a transaction and make all changes permanent. Until a transaction is committed, other users cannot see the changes made to the database.

ROLLBACK- The ROLLBACK statement is used to end a transaction and undo the work done by that transaction. After ROLLBACK, it looks like that transaction had never begun.

SAVEPOINT-It is point in a transaction, up till which all changes have been saved permanently.

ACID- It is an acronym of ATOMOCITY, CONSISTENCY, ISOLATION, DURABILITY

(For Details see **SOLVED QUESTIONS**.)

SOLVED QUESTIONS

1. **Define a transaction.**

   Ans. -A transaction is a logical unit of a work that must succeed or fail in its entirely. It is an atomic operation which can be divided unto smaller operations.

2. **What are the two ways in which multiple transactions can be executed?**

   Ans. - Multiple transactions can be executed in one of the following two ways:
   (i)   Serially   (ii) Concurrently

3. **What is a savepoint?**

   Ans. - Savepoints are special operations that allow you to divide the work of a transaction into different segments. In case of a failure, you can execute rollbacks to the savepoint only, leaving prior changes intact.

4. **What to you understand by a database transaction?**
   Ans. - A database transaction is a logical unit of work that must succeed or fail in its entirely.

5. **Why do understand by transaction COMMIT and ROLLBACK?**
   Ans-COMMITing a transaction means all the steps of a transaction are carried out successfully and all data changes are made permanent in the database. Transaction ROLLBACK means transaction has not been finished completely and hence all data changes made by the transaction in the database if any, are undone and the database returns to the state as it was before this transaction execution started.