Introduction to MySQL and SQL

PART 1

Objective Questions

• Multiple Choice Questions

1. SQL stands for
(a) Standard Queue Language
(b) Standard Query Language
(c) Structured Query Language
(d) None of the above

Ans. (*c*) SQL stands for Structured Query Language . It is used to perform different operations with databases and the data held in tables. It can perform operations like search, delete , update etc.

2. The command CREATE belongs to
(a) DDL (b) DML
(c) TCL (d) DCL

Ans. (*a*) The CREATE command belongs to DDL category.

3. MySQL is a
(a) open source software
(b) proprietary software
(c) shareware
(d) None of the above

Ans. (*a*) MySQL is a free and open source software.

4. There are …… categories of SQL commands.
(a) 2 (b) 3
(c) 1 (d) 4

Ans. (*d*) SQL commands are divided into 4 categories : DDL , DML , TCL and DCL.

5. The command used to remove objects from a database is
(a) DELETE (b) DROP
(c) REMOVE (d) CLEAR

Ans. (*b*) The DROP command used to remove objects completely from a database.

6. In MySQL, commands can be written in
(a) uppercase (b) lowercase
(c) title case (d) any case

Ans. (*d*) In MySQL, commands are not case- sensitive , hence commands can be written in any case.

7. The command to modify data in SQL
(a) ALTER (b) UPDATE
(c) CREATE (d) None of these

Ans. (*b*) The UPDATE command is used in SQL to make changes to the data of a table.

8. Which of the following is not a feature of MySQL?
(a) Cross platform
(b) User friendly
(c) Open source
(d) License fee is to be paid for use

Ans. (*d*) MySQL does not need any license fee to be paid for use.

9. A …… declares that an index in one table is related to that in another table. **(NCERT)**
(a) foreign key (b) composite key
(c) secondary key (d) primary key

Ans. (*a*) A foreign key is a linking column in two tables that indicates the relation between the two tables.

10. Given the table Student **(NCERT)**

RollNumber	SName	DateofBirth	Guid
1	Atharv Ahuja	2003-05-15	444444444444
3	Taleem Shah	2002-02-28	101010101010
4	John Dsouza	2003-08-18	333333333333
5	Ali Shah	2003-07-05	101010101010
6	Manika Pal	2002-03-10	466444444666

What is the degree of the table?
(a) 2 (b) 1
(c) 3 (d) 4

Ans. (*d*) Degree is the number of columns in a table . The Student table contains 4 columns, so degree is 4.

• Case Based MCQs

Direction *Read the case and answer the following questions.*

11. Mr. Subramaniyam is new to databases and its formation, using softwares . He is confused between certain terms related to database management softwares and the SQL commands used in them. Help him in understanding the concepts.

(i) Which of the following are not DBMS?
(a) MySQL (b) Adobe Reader
(c) Oracle (d) DB/2

(ii) RDBMS stands for
(a) Real Database Making Software
(b) Reading and Database Making Software
(c) Relational Database Management System
(d) Real Database Making Structure

(iii) DML commands help to
(a) add records
(b) remove a table
(c) create a database
(d) remove a database

(iv) He wanted to know the command to be used to delete the records of a table, the command is
(a) REMOVE (b) ADD
(c) DELETE (d) DROP

(v) He wanted to create a table Sports where he wanted to have SportsID as the primary key. Can he insert two SportIDs with same value ? **(NCERT)**
(a) Yes
(b) No
(c) Yes, if SportsID is foreign key
(d) Yes , if SportsID does not store numbers

Ans. (i) (*b*) Adobe reader is a software that helps to create platform independent document files.
(ii) (*a*) DML or Data Manipulation Language commands help to add, modify , delete and view records of a table.
(iii) (*c*) RDBMS stands for Relational Database Management System.
(iv) (*c*) The command is DELETE that delete records of a table.
(v) (*b*) Primary keys cannot have duplicate values.

12. Mrs. Rama wants to create two tables Employee and Work storing details of employees and their work locations as follows

Table : Employee

EmpId	EmpName	Dept	LocationID
1	Mrs. Aritri	Accts	L1
2	Mr. Rai	Sales	L2
3	Ms. Sunetra	IT	L3
4	Mr. Jacob	Accts	L2
5	Mr. Subir	IT	L3

Table : Work

LocationID	Location	Type
L1	Switzerland	Abroad
L2	Bangalore	Country
L3	Kolkata	Country

(i) Which column links the two tables?
(a) LocationID (b) Type
(c) EmpName (d) EmpId

(ii) Which column can be the primary key of the Employee table? **(NCERT)**
(a) EmpName (b) Dept
(c) EmpId (d) LocationID

(iii) What command she can use to create the tables?
(a) ALTER (b) CREATE
(c) APPEND (d) None of these

(iv) Which column can be the primary key of the Work table ? **(NCERT)**
(a) LocationID
(b) Location
(c) Type
(d) Primary key is not required

(v) If she wants to add a column to the table , the command that she would use , will be of which category ?
(a) DDL (b) TCL
(c) DML (d) DCL

Ans. (i) (*a*) The locationID is the column that common in both the tables and can be used to link both the tables.
(ii) (*c*) Primary key must be unique and carry not null values. It should be capable of identifying the records uniquely. Hence, EmpId can be the primary key.
(iii) (*b*) The CREATE is a DDL command that creates a table.
(iv) (*a*) The LocationID is the column that can uniquely identify the records of the Work table, hence it qualifies for being the primary key.
(v) (*a*) DDL or Data Definition Language commands are those that help to define database objects and their schema.

PART 2
Subjective Questions

• Short Answer Type Questions

1. Can a foreign key column be removed? What will happen if such a column is removed?

Ans. Yes, a foreign key column can be removed.
When a referenced foreign key is deleted or updated, respectively, the columns of all rows referencing that key will be set to NULL. The column must allow NULL or this update will fail.
You can delete a foreign key constraint in SQL Server by using SQL Server Management Studio or Transact-SQL. Deleting a foreign key constraint removes the requirement to enforce referential integrity.

2. What are the different categories of SQL commands?

Ans. The SQL command categories are

(i) **DDL** Data Defination Language

(ii) **DML** Data Manipulation Language

(iii) **TCL** Transaction Control Language

(iv) **DCL** Data Control Language

3. Name few other softwares that belong to the same category as MySQL.

Ans. MySQL is a database management software . Other softwares that belong to the same category are Oracle, MS-Access , DB/2 , Microsoft SQL Server, etc.

4. Describe the terms

(i) Domain (ii) DB2

Ans. (i) **Domain** It is a set of possible values for an attribute. A domain is said to be atomic if elements of the domain are considered as indivisible units.

(ii) **DB2** It is a Relational Database Management System (RDBMS), fully-featured, high performance database capable of handling large quantities of data and concurrently serving many users.

5. Write one difference between data and information.

Ans. Data is raw, unorganised facts that need to be processed. Data can be something simple and random. It is useless until it is organised. *For example*, each student's test score is one piece of data. When data is processed, organised, structured or presented in a given context so as to make it useful, it is called information.

6. What are the integer data types in MySQL?

Ans. MySQL supports the following integer data types

(i) TINYINT

(ii) SMALLINT

(iii) MEDIUMINT

(iv) INT

(v) BIGINT

7. State and explain the command that opens a database for working.

Ans. The USE command opens a database for working in it. A database must be opened using the USE command before anything can be done on its components. It belongs to DDL category.

8. What the float data type variations available in MySQL?

Ans. The float data type variations are

(i) **DOUBLE** (N,D) A large number with floating decimal point. It cannot be unsigned. It's size is 8 bytes. Here, N represents the total number of digits and D represents the number of decimals.

(ii) **DECIMAL** (N,D) An unpacked floating point number that cannot be unsigned. In decimal, each decimal number corresponds to one byte. Here, N is the total number of digits and D is the number of decimals.

9. In a sports academy there are two tables to store data

Sport(Sport_ID, SportName,Charges)

Sportsman(SP_ID,Sport_ID,SP_Name,Address)

(i) Is it correct to assign Sport_ID as the primary key in the Sport relation? If no, then suggest an appropriate primary key.

(ii) Is it correct to assign SP_ID as the primary key in the Sportsman relation? If no, then suggest appropriate primary key.

Ans. (i) Yes, it is correct to assign Sport_ID as primary key as it will contain unique and not null values and it can be used for identifying the records.

(ii) Yes, it is correct to assign SP_ID as primary key as it will contain unique and not null values and it can be used for identifying the records.

10. An organisation wants to create a database STAFFDB to maintain following details about its employees and their families. **(NCERT)**

Staff(Aadhar, SName, Location , Dept, StaffID)

Family(StaffID, DependentName, Relation)

(i) The attributes of STAFF, which can be used as candidate keys.

(ii) The company wants to retrieve details of dependent of a particular staff. Name the tables and the key which are required to retrieve this detail.

Ans. (i) **Candidate Keys** Aadhar, StaffID

(ii) **Tables required** Staff , Family

Key StaffID

11. Distinguish between UPDATE and ALTER commands.

Ans. Differences between UPDATE and ALTER Commands are as follows

UPDATE	**ALTER**
Belongs to DML category.	Belongs to DDL category.
Modified data of a table.	Modifies structure of the table .
Data can be modified with new data or expressions.	Columns can be added, modified , removed and renamed.

12. Explain the DML commands.

Ans. There are some DML commands are

(i) **SELECT** Used to retrieve data from a database.

(ii) **INSERT** Used to insert data into a table.

(iii) **UPDATE** Used to update existing data within a table.

(iv) **DELETE** Used to delete all records from a table, the space of the records remains.

13. Write the important characteristics of SQL.

Ans. There are some important characteristics of SQL are

(i) SQL is used specificially for relational databases.

(ii) SQL statements end with a semicolon (;).

(iii) SQL is an ANSI and ISO standard computer language for creating and manipulating databases.

(iv) SQL allows the user to create, update, delete and retrieve data from a database.

(v) SQL is very simple and easy to learn.

14. Differentiate DELETE and DROP commands of SQL.

Ans. Differences between DELETE and DROP cammands are

DELETE	DROP
Belongs to DML category.	Belongs to DDL category.
Used to remove records from a table.	Used to remove database objects like tables and databases.
Works with components of a table.	Works with entire database objects.

15. Differentiate between COMMIT and ROLLBACK command.

Ans. COMMIT command is used to permanent all the changes made by DML commands, while ROLLBACK means that it undoes all changes since the beginning of a transaction or since a save point.

16. What are DDL and DML?

Ans. **DDL (Data Definition Language)** is a part of SQL, which provides commands for creating, altering and dropping the tables. Different DDL commands are CREATE, ALTER, DROP and RENAME.

DML (Data Manipulation Language) is a part of SQL, which provides commands for inserting, deleting and updating the information in a database. Different DML commands are SELECT, UPDATE, INSERT.

• Long Answer Type Questions

17. Explain the major components of a database system.

Ans. The major components of a database system are Hardware, Software, Data, Database Access Language, Procedures and Users all together form the components of a DBMS.

Let us discuss the components one by one clearly.

Hardware The hardware is the actual computer system used for keeping and accessing the database. The conventional DBMS hardware consists of secondary storage devices such as hard disks. Databases run on the range of machines from micro computers to mainframes.

Software Software is the actual DBMS between the physical database and the users of the system. All the requests from the user for accessing the database are handled by DBMS.

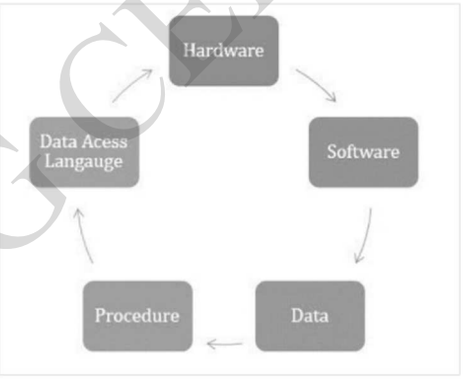
Data It is an important component of the database management system. The main task of DBMS is to process the data. Databases are used to store the data, retrieved and updated to and from the databases.

Users There are a number of users who can access or retrieve the data on demand using the application and the interfaces provided by the DBMS.

The users of the database can be classified into different groups

- Native Users
- Online Users
- Sophisticated Users
- Specialized Users
- Application Users
- DBA- Database Administrator

The components of DBMS are given below in pictorial form



18. Explain the features of MySQL software.

Ans. The features of MySQL are as follows

(i) **Speed** MySQL is a very fast and reliable database program that supports clump servers for several demanding application programs. The speed of MySQL has been backed up by a large number of benchmark tests.

(ii) **Open Source** It is an open source database system which means anyone can use it without any cost. One of the most benefit of MySQL includes its wide availability in the market with no ownership cost.MySQL is quite customisable due to the fact that developers can alter its code in order to satisfy their needs.

(iii) **Ease to Use** MySQL is a high performance but relatively simple database system and is less complex to setup or examine than larger database systems.

(iv) **Query Language Support** ANSI (American National Standard Institute) standard SQL is an easy language to use because of its straight forward and simple syntax. MySQL supports standard based SQL (Structured Query Language) for querying and managing relational databases.

(v) **Security** MySQL is secured as all its access passwords are stored in an encrypted format restricting any unauthorised access to the system. It also encrypts the transactions so eavesdroppers and data maintenance tools cannot replicate or regenerate the database transactions once they are processed.

(vi) **Cross Platform Portability** MySQL is easily installable and operable on different platforms including Linux, Windows, OS2, Solaris etc. It also contains APIs for integration with various programming languages like C, C++, PHP, Java, Perl, Python and Ruby etc.

19. Write the different SQL commands with their uses

Ans. There are different types of SQL command as

(i) **Data Definition Language (DDL)** DDL is used to define the structure of your tables and other objects in the database. In DBMS, it is used to specify a database schema as a set of definitions (expressed in DDL), In SQL, DDL allows you to create, alter and destroy database objects.

(ii) **Data Manipulation Language (DML)** DML provides various commands used to access and manipulate data in existing database. This manipulation involves inserting data into database tables, retrieving existing data, deleting data from existing tables and modifying existing data.

(iii) **Transaction Control Language (TCL)** TCL is playing an important role in SQL. TCL commands are used to manage transactions in database. These are also used to manage the changes made by DML statements. It allows statements to be grouped together into logical transactions. A transactions is a single unit of work.

(iv) **Data Control Language (DCL)** DCL commands are used to assign security levels in database which involves multiple user setups.

Basically, the DCL command of the SQL language is used to create privileges to allow users access to and manipulation of the database.

20. Differentiate DDL and DML commands of SQL with examples.

Ans. The differences between DDL and DML commands are

DDL	DML
DDL is the abbreviation of Data Definition Language.	DML is the abbreviation of Data Manipulation Language.
It is used to create and modify the structure of database objects in database.	It is used to retrieve, store, modify, delete, insert and update data in database.
DDL commands allow us to perform tasks related to data definition.	DML commands are used to manipulate data.
For example, CREATE, ALTER and DROP commands.	*For example*, SELECT, UPDATE and INSERT commands.

21. Write SQL commands for the question from (i) to (viii) on the basis of table MASTER (contains details of employees).

Table : MASTER

S.No.	Name	Age	Department	Salary
1	Shyam	21	Computer	12000
2	Shiv	25	Maths	15000
3	Rakesh	31	Hindi	14000
4	Sharmila	32	History	20000
5	Dushyant	25	Software	30000

(i) Write a command to update the salary of the employee to 40000, whose S. No. is 3.

(ii) Write a query to add a column Date_of_Joining to the table MASTER.

(iii) Select Age, Department of those employees whose salary is greater than 12000.

(iv) List all data of table MASTER.

(v) Write a query to change the data type of a column Name to varchar with size 35.

(vi) Write a command to delete the table MASTER those employees whose name is Rakesh.

(vii) Write a command to update the department of the employee to english, whose name is Dushyant.

(viii) Write a command to delete the table with the structure.

Ans. (i)
```
mysql>UPDATE MASTER SET Salary
= 40000 WHERE S.No.=3;
```

(ii)
```
mysql>ALTER TABLE MASTER ADD Date_of_Joining
DATE;
```

(iii)
```
mysql>SELECT Age, Department
FROM MASTER WHERE Salary>12000;
```

(iv)
```
mysql>SELECT * FROM MASTER;
```

(v)
```
mysql>ALTER TABLE MASTER MODIFY
 Name VARCHAR (35);
```

(vi)
```
mysql>DELETE FROM MASTER WHERE
Name="Rakesh";
```

(vii)
```
mysql>UPDATE MASTER SET Department
= "English" WHERE Name = "Dushyant";
```

(viii)
```
mysql>DROP TABLE MASTER;
```

22. Consider the following table named "SBOP" with details of account holders. Write commands of MySQL for (i) to (iv).

Table : SBOP

AccountNo	Name	Balance	DateOfOpen	Transactions
SB-1	Mr. Anil	15000.00	2011-02-24	7
SB-2	Mr. Amit	23567.89	NULL	8
SB-3	Mrs. Sakshi	45000.00	2012-02-04	5
SB-4	Mr. Gopal	23812.35	2013-09-22	NULL
SB-5	Mr. Dennis	63459.80	2009-11-10	15

(i) To display AccountNo, Name and DateOfOpen of account holders having transactions more than 8.

(ii) To display all information of account holders whose transaction value is not mentioned.

(iii) To add another column Address with data type and size as Varchar(25).

(iv) To display the month day with reference to DateOfOpen for all the account holders.

Ans. (i)
```
SELECT AccountNo, Name, DateOfOpen
FROM SBOP WHERE Transactions > 8;
```
(ii)
```
SELECT * FROM SBOP
WHERE Transactions IS NULL;
```
(iii)
```
ALTER TABLE SBOP
ADD Address VARCHAR(25);
```
(iv)
```
SELECT DAYOFMONTH(DateOfOpen),
Name FROM SBOP;
```

Chapter Test

Multiple Choice Questions

1. ..... commands work with entire database objects.
(a) DML (b) DDL
(c) TCL (d) DCL

2. The time format used in MySQL is
(a) MM:HH:SS (b) HH:MM:SS
(c) SS:MM:HH (d) None of these

3. Which of the following are not features of MySQL?
(a) Source code cannot be modified.
(b) Free usage for limited period.
(c) Cannot be redistributed.
(d) None of the above

4. What is the maximum number of characters that can be specified for a varchar field?
(a) 10 (b) 200
(c) 100 (d) 255

5. What is the size in bytes of TINYINT data type?
(a) 2 Bytes (b) 1 Byte
(c) 10 Bytes (d) None of these

Short Answer Type Questions

6. Compare the following commands
(i) DROP
(ii) USE

7. Explain the cross platform working feature of MySQL.

8. A table "T1" comprises of 10 columns and 15 rows .
3 more columns and 2 rows are added. What will be the degree and cardinality of the table now?

9. Manoj wants to create tables to store his transaction details with following columns

Table : Transaction
Tran_ID
Tran_Date
Qty
Rate
Amount
Prod_ID

Table : Product
Prod_ID
Prodname
Price

To make these tables, he got confused in some questons. Help him to clarify these issues.
(i) Identify the primary key of Transaction table.
(ii) Identify the foreign key of Transaction table.

10. Given a table "HouseBuilding" carrying following columns

BuildingID	BName	Registration_No	Locality	PinNo	HoldingNo	Phone	E-mail

(i) Identify the columns that can be candidate keys.
(ii) If BuildingID is selected as primary key, which columns will be alternate keys ?

Long Answer Type Questions

11. Write commands as specified
Neeraj wants to create a database "Library" and create a table " Book" in it.
The columns in the table would be as follows. A sample data is also given

BookID	Bookname	Type	Price	Pub
B01	Astronomy	Science	2000.50	PHI

Write the set of SQL commands for the above.

12. Given two tables Student and Hostel

Table : Student

RollNo	Name	Class	HostelID
1	Sumita	11	H1
2	Anil	12	H2
3	Srinjal	8	H1
4	Laxmi	9	H3

Table : Hostel

HostelID	HostelName	Location
H1	Ganga	Delhi
H2	Yamuna	Mumbai
H3	Saraswati	Kolkata

(i) Identify the primary keys of both the tables.
(ii) Identify the foreign key of Student table.
(iii) What is the hostel name of Srinjal?

13. Differentiate primary key and foreign key.

14. Write the following features
(i) Security (ii) Query language support
(iii) Connectivity

Answers

Multiple Choice Questions

1. *(b)* ***2.*** *(b)* ***3.*** *(d)* ***4.*** *(d)* ***5.*** *(b)*