***Ex:1***

Explain the difference between DDL and DML, give the following examples:

a.at least 3 DDL commands;

b.at least 4 DML commands;

*Ans:*

DDL is Data Definition Language which is used to define data structures.

For example: create table, alter table are instructions in SQL.

DML is Data Manipulation Language which is used to manipulate data itself.

For example: insert, update, delete are instructions in SQL.

Difference between DDL and DML:

DDL:

It is used to create database schema and can be used to define some constraints as well.

DDL does not use WHERE clause in its statement.

Basic command present in DDL are CREATE, DROP, RENAME etc.

DML:

It is used to add, retrieve or update the data.

DML uses WHERE clause in its statement.

Basic command present in DML are UPDATE, INSERT, DELETE, MERGE etc.

***Ex:2***

Write SQL statements to create tables in the figure below:

*Ans:*

CREATE TABLE customers (

id INTEGER PRIMARY KEY ,

full\_name VARCHAR(50) NOT NULL ,

timestamp TIMESTAMP NOT NULL ,

delivery\_address TEXT NOT NULL

);

CREATE TABLE orders (

code INTEGER PRIMARY KEY ,

customer\_id INTEGER REFERENCES customers(id),

total\_sum DOUBLE PRECISION NOT NULL CHECK (total\_sum>0),

is\_paid BOOLEAN NOT NULL

);

CREATE TABLE products (

id VARCHAR PRIMARY KEY,

name VARCHAR UNIQUE NOT NULL

description TEXT,

price DOUBLE PRECISION NOT NULL CHECK(price>0)

);

CREATE TABLE order\_items (

order\_code INTEGER REFERENCES orders(code),

product\_id VARCHAR REFERENCES products(id),

PRIMARY KEY (order\_code,product\_id),

quantity INTEGER NOT NULL CHECK(quantity>0)

);

***Ex:3***

Write SQL statements describing tables with appropriate data types and constraints satisfying the following conditions (maybe you need additional tables to store data atomically a deficiently ):

a. a students table storing data such as full name, age, birth date, gender, average grade, information about yourself, the need for a dormitory, additional info.

b. an instructors table storing data such as full name, speaking languages, work experience, the possibility of having remote lessons.

c. a lesson participants table storing data such as lesson title, teaching instructor, studying students, room number.

*Ans:*

--condition a

CREATE TABLE students (

student\_id INTEGER primary key ,

full\_name TEXT NOT NULL ,

age INTEGER NOT NULL ,

birth\_date DATE NOT NULL ,

gender varchar(10) NOT NULL,

average\_grade NUMERIC(3,2) NOT NULL CHECK (average\_grade>2), --for example 3.56,2.85

info TEXT NOT NULL ,

need\_for\_dormitory BOOLEAN NOT NULL ,

add\_info TEXT

);

--condition b

CREATE TABLE instructors (

instructor\_id INTEGER PRIMARY KEY ,

full\_name TEXT NOT NULL ,

speaking language VARCHAR(50) NOT NULL ,

work\_experience INTEGER NOT NULL ,

remote\_lesson BOOLEAN NOT NULL

);

--condition c

CREATE TABLE lesson (

lesson\_title VARCHAR(50) NOT NULL ,

instructor\_id INTEGER REFERENCES instructors,

student\_id INTEGER REFERENCES students,

room\_number INTEGER NOT NULL

);

***Ex:4***

Give examples of insertion, update and deletion of data ontables from exercise 2.

*Ans:*

INSERT INTO products(id,name,description,price) VALUES('100115','book','dictionary','33.355');

UPDATE products SET name='book1' WHERE name='book';

DALETE FROM products WHERE id='100115';