Question 1

-- Create the database

CREATE DATABASE CollegeDB;

USE CollegeDB;

-- Create STUDENT table

CREATE TABLE STUDENT (

USN VARCHAR(20) PRIMARY KEY,

SName VARCHAR(50) NOT NULL,

Address VARCHAR(100),

Phone VARCHAR(15),

Gender CHAR(1) CHECK (Gender IN ('M', 'F'))

);

-- Create SEMSEC table

CREATE TABLE SEMSEC (

SSID VARCHAR(10) PRIMARY KEY,

Sem INT NOT NULL CHECK (Sem BETWEEN 1 AND 8),

Sec CHAR(1) NOT NULL CHECK (Sec IN ('A', 'B', 'C'))

);

-- Create CLASS table (junction table between STUDENT and SEMSEC)

CREATE TABLE CLASS (

USN VARCHAR(20),

SSID VARCHAR(10),

PRIMARY KEY (USN, SSID),

FOREIGN KEY (USN) REFERENCES STUDENT(USN),

FOREIGN KEY (SSID) REFERENCES SEMSEC(SSID)

);

-- Create COURSE table

CREATE TABLE COURSE (

Subcode VARCHAR(10) PRIMARY KEY,

Title VARCHAR(50) NOT NULL,

Sem INT NOT NULL CHECK (Sem BETWEEN 1 AND 8),

Credits INT NOT NULL CHECK (Credits BETWEEN 1 AND 5)

);

-- Create IAMARKS table

CREATE TABLE IAMARKS (

USN VARCHAR(20),

Subcode VARCHAR(10),

SSID VARCHAR(10),

Test1 DECIMAL(5,2) CHECK (Test1 BETWEEN 0 AND 20),

Test2 DECIMAL(5,2) CHECK (Test2 BETWEEN 0 AND 20),

Test3 DECIMAL(5,2) CHECK (Test3 BETWEEN 0 AND 20),

FinalIA DECIMAL(5,2) CHECK (FinalIA BETWEEN 0 AND 20),

PRIMARY KEY (USN, Subcode, SSID),

FOREIGN KEY (USN) REFERENCES STUDENT(USN),

FOREIGN KEY (Subcode) REFERENCES COURSE(Subcode),

FOREIGN KEY (SSID) REFERENCES SEMSEC(SSID)

);

# insert value

-- Insert sample data into STUDENT

INSERT INTO STUDENT VALUES

('1BI15CS101', 'John Doe', '123 Main St', '9876543210', 'M'),

('1BI15CS102', 'Jane Smith', '456 Oak Ave', '9876543211', 'F'),

('1BI16CS201', 'Robert Johnson', '789 Pine Rd', '9876543212', 'M'),

('1BI17CS301', 'Emily Davis', '321 Elm St', '9876543213', 'F');

-- Insert sample data into SEMSEC

INSERT INTO SEMSEC VALUES

('4C', 4, 'C'),

('8A', 8, 'A'),

('8B', 8, 'B'),

('8C', 8, 'C');

-- Insert sample data into CLASS

INSERT INTO CLASS VALUES

('1BI15CS101', '4C'),

('1BI15CS102', '4C'),

('1BI16CS201', '8A'),

('1BI17CS301', '8B');

-- Insert sample data into COURSE

INSERT INTO COURSE VALUES

('CS401', 'Database Systems', 4, 4),

('CS402', 'Operating Systems', 4, 4),

('CS801', 'Machine Learning', 8, 5),

('CS802', 'Cloud Computing', 8, 5);

-- Insert sample data into IAMARKS

INSERT INTO IAMARKS VALUES

('1BI15CS101', 'CS401', '4C', 15, 18, 16, NULL),

('1BI15CS101', 'CS402', '4C', 12, 14, 13, NULL),

('1BI16CS201', 'CS801', '8A', 18, 17, 19, NULL),

('1BI17CS301', 'CS802', '8B', 10, 12, 11, NULL);

-- Update FinalIA values (average of best two tests)

UPDATE IAMARKS

SET FinalIA = (Test1 + Test2 + Test3 - LEAST(Test1, Test2, Test3)) / 2;

p

# query

List all the students

sql

SELECT \* FROM STUDENT;

2. Details of students studying in fourth semester 'C' section

sql

SELECT s.\*

FROM STUDENT s

JOIN CLASS c ON s.USN = c.USN

JOIN SEMSEC ss ON c.SSID = ss.SSID

WHERE ss.Sem = 4 AND ss.Sec = 'C';

3. Count of male and female students by semester and section

sql

SELECT ss.Sem, ss.Sec, s.Gender, COUNT(\*) as Count

FROM STUDENT s

JOIN CLASS c ON s.USN = c.USN

JOIN SEMSEC ss ON c.SSID = ss.SSID

GROUP BY ss.Sem, ss.Sec, s.Gender

ORDER BY ss.Sem, ss.Sec, s.Gender;

4. Create view for Test1 marks of student '1BI15CS101'

sql

CREATE VIEW Student1\_Test1\_Marks AS

SELECT c.Title, i.Test1

FROM IAMARKS i

JOIN COURSE c ON i.Subcode = c.Subcode

WHERE i.USN = '1BI15CS101';

-- To see the view:

SELECT \* FROM Student1\_Test1\_Marks;

5. Calculate and update FinalIA (average of best two test marks)

sql

UPDATE IAMARKS

SET FinalIA = (Test1 + Test2 + Test3 - LEAST(Test1, Test2, Test3)) / 2;

6. Categorize 8th semester students (A, B, C sections)

sql

SELECT s.USN, s.SName, ss.Sec, i.FinalIA,

CASE

WHEN i.FinalIA BETWEEN 17 AND 20 THEN 'Outstanding'

WHEN i.FinalIA BETWEEN 12 AND 16 THEN 'Average'

WHEN i.FinalIA < 12 THEN 'Weak'

END AS Category

FROM STUDENT s

JOIN CLASS c ON s.USN = c.USN

JOIN SEMSEC ss ON c.SSID = ss.SSID

JOIN IAMARKS i ON s.USN = i.USN AND c.SSID = i.SSID

WHERE ss.Sem = 8 AND ss.Sec IN ('A', 'B', 'C')

ORDER BY ss.Sec, s.USN;