**SOLUTIONS:**

**5#**

conn system/system

**a)**

**UNIVERSITY**

CREATE TABLE UNIVERSITY

(

UNIVERSITY\_ID NUMBER(2),

UNIVERSITY\_NAME VARCHAR2(100),

ADDRESS VARCHAR2(100),

STATE VARCHAR2(100),

PRIMARY KEY (UNIVERSITY\_ID)

);

DESC UNIVERSITY;

**DEPARTMENT**

CREATE TABLE DEPARTMENT

(

DEPARTMENT\_ID NUMBER(4),

DEPARTMENT\_NAME VARCHAR2(100),

DEPARTMENT\_LOC VARCHAR2(20),

UNIVERSITY\_ID NUMBER(10),

PRIMARY KEY (DEPARTMENT\_ID),

FOREIGN KEY (UNIVERSITY\_ID) REFERENCES UNIVERSITY(UNIVERSITY\_ID)

);

DESC DEPARTMENT;

**PROGRAM**

CREATE TABLE PROGRAM

(

PROGRAM\_ID NUMBER(6),

PROGRAM\_NAME VARCHAR2(100),

TOTAL\_SEATS NUMBER(10),

SEMESTERS NUMBER(2),

UNIVERSITY\_ID NUMBER(2),

DEPARTMENT\_ID NUMBER(4),

PRIMARY KEY (PROGRAM\_ID),

FOREIGN KEY (DEPARTMENT\_ID) REFERENCES DEPARTMENT (DEPARTMENT\_ID),

FOREIGN KEY (UNIVERSITY\_ID) REFERENCES UNIVERSITY (UNIVERSITY\_ID)

);

DESC PROGRAM;

**COURSE**

CREATE TABLE COURSE

(

COURSE\_ID NUMBER(8),

COURSE\_NAME VARCHAR2(100),

COURSE\_CODE VARCHAR2(100),

COURSE\_CREDITS NUMBER(2),

TOTAL\_LECTURES NUMBER(2),

PROGRAM\_ID NUMBER(6),

PRIMARY KEY (COURSE\_ID),

FOREIGN KEY (PROGRAM\_ID) REFERENCES PROGRAM (PROGRAM\_ID)

);

DESC COURSE;

**SYLLABUS**

CREATE TABLE SYLLABUS

(

SYLLABUS\_ID NUMBER(10),

SYLLABUS\_NAME VARCHAR2(100),

TOTAL\_UNITS NUMBER(2),

CLASS\_PER\_WEEK NUMBER(2),

FOREIGN KEY (SYLLABUS\_ID) REFERENCES COURSE (COURSE\_ID)

);

DESC SYLLABUS;

**FACULTY**

CREATE TABLE FACULTY

(

FACULTY\_ID NUMBER(12),

FACULTY\_NAME VARCHAR2(200),

ADDRESS VARCHAR(200),

FACULTY\_SPECIALIZATION VARCHAR(200),

DEPARTMENT\_ID NUMBER(10),

PRIMARY KEY (FACULTY\_ID),

FOREIGN KEY (DEPARTMENT\_ID) REFERENCES DEPARTMENT (DEPARTMENT\_ID)

);

DESC FACULTY;

**SECONDARY INDEX FOR EACH TABLE**

CREATE INDEX UNIVERSITY\_INDEX ON UNIVERSITY (UNIVERSITY\_ID,UNIVERSITY\_NAME, ADDRESS, STATE);

CREATE INDEX DEPARTMENT\_INDEX ON DEPARTMENT (DEPARTMENT\_ID, DEPARTMENT\_NAME, DEPARTMENT\_LOC, UNIVERSITY\_ID

);

CREATE INDEX PROGRAM\_INDEX ON PROGRAM (PROGRAM\_ID,PROGRAM\_NAME,TOTAL\_SEATS,SEMESTERS, UNIVERSITY\_ID,DEPARTMENT\_ID

);

CREATE INDEX COURSE\_INDEX ON COURSE (COURSE\_ID,COURSE\_NAME,COURSE\_CODE,COURSE\_CREDITS,TOTAL\_LECTURES, PROGRAM\_ID

);

CREATE INDEX SYLLABUS\_INDEX ON SYLLABUS (SYLLABUS\_ID ,SYLLABUS\_NAME, TOTAL\_UNITS, CLASS\_PER\_WEEK

);

CREATE INDEX FACULTY\_INDEX ON FACULTY (FACULTY\_ID,

FACULTY\_NAME, ADDRESS, FACULTY\_SPECIALIZATION, DEPARTMENT\_ID

);

**b)**

**University**

INSERT INTO UNIVERSITY VALUES (01, 'Aligarh Muslim University', 'Aligarh', 'Uttar Pradesh');

INSERT INTO UNIVERSITY VALUES (02, 'Jamia Millia Islamia', 'New Delhi', 'Delhi');

INSERT INTO UNIVERSITY VALUES (03, 'Jawaharlal Nehru University', 'New Delhi', 'Delhi');

INSERT INTO UNIVERSITY VALUES (04, 'Delhi University', 'New Delhi', 'Delhi');

INSERT INTO UNIVERSITY VALUES (05, 'University Of Jammu', 'Srinagar', 'Jammu And Kashmir');

SELECT \* FROM UNIVERSITY ORDER BY UNIVERSITY\_ID;

**Department**

INSERT INTO DEPARTMENT VALUES (101, 'Computer Science', 'LOC\_1', 01);

INSERT INTO DEPARTMENT VALUES (102, 'Computer Applications', 'LOC\_2', 04);

INSERT INTO DEPARTMENT VALUES (103, 'Mathematics', 'LOC\_3', 01);

INSERT INTO DEPARTMENT VALUES (104, 'Chemistry', 'LOC\_4', 05);

INSERT INTO DEPARTMENT VALUES (105, 'Botany', 'LOC\_5', 05);

SELECT \* FROM DEPARTMENT;

**Program**

INSERT INTO PROGRAM VALUES (201, 'B.Sc (Chemistry)', 100, 8, 05, 104);

INSERT INTO PROGRAM VALUES (202, 'B.Sc (Botany)', 100, 8, 05, 105);

INSERT INTO PROGRAM VALUES (203, 'BCA', 100, 8, 01, 102);

INSERT INTO PROGRAM VALUES (204, 'MCA', 100, 4, 01, 101);

INSERT INTO PROGRAM VALUES (205, 'MCA', 100, 4, 04, 102);

SELECT \* FROM PROGRAM;

**Course**

INSERT INTO COURSE VALUES (301, 'Computer Architecture', 'CS101',4,20,204);

INSERT INTO COURSE VALUES (302, 'Computer Architecture', 'CS201',4,20,205);

INSERT INTO COURSE VALUES (303, 'Introduction To IT', 'CS301', 4,20,205);

INSERT INTO COURSE VALUES (304, 'Organic Chemistry', 'CC401', 4, 20, 201);

INSERT INTO COURSE VALUES (305, 'Plant Kingdom', 'BC401',4,20,202);

SELECT \* FROM COURSE;

**Syllabus**

INSERT INTO SYLLABUS VALUES (301, 'Digital Logic Design', 4, 4);

INSERT INTO SYLLABUS VALUES (302, 'Memory System', 4, 4);

INSERT INTO SYLLABUS VALUES (303, 'Operating Systems', 4, 2);

INSERT INTO SYLLABUS VALUES (304, 'Stereochemistry', 4, 2);

INSERT INTO SYLLABUS VALUES (305, 'Plant Naming', 4, 4);

SELECT \* FROM SYLLABUS;

**Faculty**

INSERT INTO FACULTY VALUES (401, 'John', 'New Delhi', 'Computer Science', 101);

INSERT INTO FACULTY VALUES (402, 'Alex', 'Aligarh', 'Information Security', 102);

INSERT INTO FACULTY VALUES (403, 'Faran', 'New Delhi', 'Information Security', 101);

INSERT INTO FACULTY VALUES (404, 'Zaid', 'Srinagar', 'Organic Chemistry', 104);

INSERT INTO FACULTY VALUES (405, 'Talha', 'Srinagar', 'Plant Kingdom', 105);

SELECT \* FROM FACULTY;

**c)**

**i)**

SELECT UNIVERSITY\_NAME FROM UNIVERSITY WHERE STATE='Delhi';

**ii)**

SELECT DEPARTMENT.DEPARTMENT\_NAME FROM DEPARTMENT, UNIVERSITY WHERE (DEPARTMENT. UNIVERSITY\_ID=UNIVERSITY.UNIVERSITY\_ID) AND (UNIVERSITY\_NAME='Aligarh Muslim University');

**iii)**

SELECT ADDRESS, STATE FROM UNIVERSITY WHERE UNIVERSITY\_NAME='Jawaharlal Nehru University';

**iv)**

SELECTPROGRAM.PROGRAM\_NAME FROM PROGRAM, UNIVERSITY WHERE (PROGRAM. UNIVERSITY\_ID=UNIVERSITY.UNIVERSITY\_ID) AND (UNIVERSITY. UNIVERSITY\_NAME='University Of Jammu');

**v)**

SELECT UNIVERSITY.UNIVERSITY\_NAME FROM UNIVERSITY, PROGRAM WHERE (UNIVERSITY. UNIVERSITY\_ID=PROGRAM.UNIVERSITY\_ID) AND (PROGRAM.PROGRAM\_NAME='MCA');

**vi)**

SELECT COURSE.COURSE\_NAME FROM COURSE, PROGRAM, UNIVERSITY WHERE (COURSE.PROGRAM\_ID=PROGRAM. PROGRAM\_ID)AND(PROGRAM.UNIVERSITY\_ID=UNIVERSITY.UNIVERSITY\_ID) AND (PROGRAM.PROGRAM\_NAME='MCA') AND (UNIVERSITY.UNIVERSITY\_NAME='Aligarh Muslim University');

**vii)**

SELECTFACULTY.FACULTY\_NAME,FACULTY.FACULTY\_SPECIALIZATION,DEPARTMENT.DEPARTMENT\_NAME, UNIVERSITY.UNIVERSITY\_NAME FROM FACULTY, DEPARTMENT, UNIVERSITY WHERE (FACULTY. DEPARTMENT\_ID=DEPARTMENT.DEPARTMENT\_ID) AND (DEPARTMENT.UNIVERSITY\_ID=UNIVERSITY.UNIVERSITY\_ID) AND(FACULTY.FACULTY\_SPECIALIZATION='Information Security');

**viii)**

SELECTCOURSE.COURSE\_NAME, SYLLABUS.SYLLABUS\_NAME, DEPARTMENT.DEPARTMENT\_NAME,UNIVERSITY.UNIVERSITY\_NAME FROM COURSE, SYLLABUS, DEPARTMENT, UNIVERSITY, PROGRAMWHERE(COURSE.COURSE\_ID=SYLLABUS.SYLLABUS\_ID) AND (COURSE. PROGRAM\_ID=PROGRAM.PROGRAM\_ID) AND (PROGRAM. DEPARTMENT\_ID=DEPARTMENT.DEPARTMENT\_ID) AND (DEPARTMENT.UNIVERSITY\_ID=UNIVERSITY.UNIVERSITY\_ID) AND (COURSE.COURSE\_NAME='Computer Architecture');