Q1:

Table 1 creation   GROUPS

```
SQL> CREATE
  2  TABLE GROUPS(
  3  Group_Id NUMBER NOT NULL,
  4  Name VARCHAR2(40),
  5  PRIMARY KEY (Group_Id));

Table created.

SQL> DES GROUPS;
SP2-0042: unknown command "DES GROUPS" - rest of line ignored.
SQL> DESC GROUPS;
 Name                                            Null?    Type
 ---------------------------------------- -------- ----------------------------
 GROUP_ID                                 NOT NULL NUMBER
 NAME                                              VARCHAR2(40)

SQL>
```

TABLE 2 creation TEACHERS

```
SQL> CREATE TABLE TEACHERS
  2  (
  3  Teacher_Id NUMBER NOT NULL,
  4   FirstName VARCHAR2(40),
  5   LastName VARCHAR2(40),
  6   PRIMARY KEY (Teacher_Id));

Table created.

SQL> DESC TEACHERS;
 Name                                      Null?    Type
 ---------------------------------------- -------- ----------------------------
 TEACHER_ID                               NOT NULL NUMBER
 FIRSTNAME                                         VARCHAR2(40)
 LASTNAME                                          VARCHAR2(40)

SQL>
```

Table 3 creation SUBJECTS

```
SQL> CREATE TABLE SUBJECTS
  2  (
  3   Subject_Id NUMBER NOT NULL,
  4  Title VARCHAR2(40),
  5   PRIMARY KEY (Subject_Id));

Table created.

SQL> DESC SUBJECTS;
 Name                                      Null?    Type
 ---------------------------------------- -------- ----------------------------
 SUBJECT_ID                               NOT NULL NUMBER
 TITLE                                             VARCHAR2(40)

SQL>
```

Table 4 creation STUDENTS

```
SQL> CREATE TABLE STUDENTS
  2  (
  3  Student_Id NUMBER NOT NULL,
  4  FirstName VARCHAR2(40),
  5  LastName VARCHAR2(40),
  6  Group_Id NUMBER NOT NULL,
  7  PRIMARY KEY (Student_Id),
  8  FOREIGN KEY (Group_Id) REFERENCES GROUPS (Group_Id));

Table created.

SQL> DESC STUDENTS;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 STUDENT_ID                                NOT NULL NUMBER
 FIRSTNAME                                          VARCHAR2(40)
 LASTNAME                                           VARCHAR2(40)
 GROUP_ID                                  NOT NULL NUMBER

SQL>
```

Table 5 creation MARKS

```
SQL> CREATE TABLE MARKS
  2  (
  3    MarkId NUMBER NOT NULL,
  4    Student_Id NUMBER NOT NULL,
  5   Subject_Id NUMBER NOT NULL,
  6   DATE_ TimeStamp,
  7   Mark NUMBER,
  8   PRIMARY KEY (MarkId),
  9      FOREIGN KEY (Student_Id) REFERENCES STUDENTS (Student_Id),
 10      FOREIGN KEY (Subject_Id) REFERENCES SUBJECTS (Subject_Id));

Table created.

SQL> DESC MARKS;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 MARKID                                    NOT NULL NUMBER
 STUDENT_ID                                NOT NULL NUMBER
 SUBJECT_ID                                NOT NULL NUMBER
 DATE_                                              TIMESTAMP(6)
 MARK                                               NUMBER

SQL>
```

Table 6 creation SUBJ_TEACH

```
SQL> CREATE TABLE SUBJ_TEACH
  2  (
  3   ST_Id NUMBER NOT NULL,
  4  Group_Id NUMBER NOT NULL,
  5  Subject_Id NUMBER NOT NULL,
  6  Teacher_Id NUMBER NOT NULL,
  7  PRIMARY KEY (ST_Id),
  8  FOREIGN KEY (Group_Id) REFERENCES GROUPS (Group_Id),
  9      FOREIGN KEY (Subject_Id) REFERENCES SUBJECTS (Subject_Id),
 10      FOREIGN KEY (Teacher_Id) REFERENCES TEACHERS (Teacher_Id));

Table created.

SQL> DESC SUBJ_TEACH;
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------------------
 ST_ID                                     NOT NULL NUMBER
 GROUP_ID                                  NOT NULL NUMBER
 SUBJECT_ID                                NOT NULL NUMBER
 TEACHER_ID                                NOT NULL NUMBER

SQL>
```

CHACK POINT: 1

```
SQL> SAVEPOINT SAVEDDL;

Savepoint created.

SQL>
```

Insertion in Groups Table

```
SQL> INSERT INTO GROUPS VALUES (1, 'Green');

1 row created.

SQL> INSERT INTO GROUPS VALUES (2, 'Blue');

1 row created.

SQL> INSERT INTO GROUPS VALUES (3, 'Red');

1 row created.

SQL>
```

```
SQL> SELECT * FROM GROUPS;

  GROUP_ID NAME
---------- ----------------------------------------
         1 Green
         2 Blue
         3 Red

SQL>
```

Insertion in Teachers Table

```
SQL> INSERT INTO TEACHERS VALUES (1, 'HASSAN', 'RAZA');

1 row created.

SQL> INSERT INTO TEACHERS VALUES (2, 'HASSAN', 'MUSTAFA');

1 row created.

SQL> INSERT INTO TEACHERS VALUES (3, 'AYEASHA', 'KAMRAN');

1 row created.

SQL>
```

```
SQL> SELECT * FROM TEACHERS;

TEACHER_ID FIRSTNAME
---------- ----------------------------------------
LASTNAME
----------------------------------------
         1 HASSAN
RAZA

         2 HASSAN
MUSTAFA

         3 AYEASHA
KAMRAN


SQL>
```

Insertion in Subjects Table

```
SQL> INSERT INTO SUBJECTS VALUES (1, 'Programming Fundamentals');

1 row created.

SQL> INSERT INTO SUBJECTS VALUES (2, 'Data Structures');

1 row created.

SQL> INSERT INTO SUBJECTS VALUES (3, 'OOP');

1 row created.

SQL>
```

```
SQL> SELECT * FROM SUBJECTS;

SUBJECT_ID TITLE
---------- ----------------------------------------
         1 Programming Fundamentals
         2 Data Structures
         3 OOP

SQL>
```

Insertion in Students Table

```
SQL> INSERT INTO STUDENTS VALUES (1, 'Ahmad', 'Ali', 1);

1 row created.

SQL> INSERT INTO STUDENTS VALUES (2, 'Aqeel', 'Afzal', 2);

1 row created.

SQL> INSERT INTO STUDENTS VALUES (3, 'Asad', 'Rizwan', 3);

1 row created.

SQL>
```

```
SQL> SELECT * FROM STUDENTS;

STUDENT_ID FIRSTNAME
---------- ---------------------------------------
LASTNAME                                    GROUP_ID
--------------------------------------- ----------
         1 Ahmad
Ali                                                1

         2 Aqeel
Afzal                                              2

         3 Asad
Rizwan                                             3


SQL>
```

Insertion in Marks Table

```
SQL> INSERT INTO MARKS VALUES (1, 1, 1,CURRENT_TIMESTAMP, 80);

1 row created.

SQL> INSERT INTO MARKS VALUES (2, 1, 2,CURRENT_TIMESTAMP, 83);

1 row created.

SQL> INSERT INTO MARKS VALUES (3, 1, 3,CURRENT_TIMESTAMP, 90);

1 row created.

SQL>
```

```
SQL> SELECT * FROM MARKS;

    MARKID STUDENT_ID SUBJECT_ID
---------- ---------- ----------
DATE_
----------------------------------------------------------------
      MARK
----------
         1          1          1
21-APR-21 10.29.56.566000 AM
        80

         2          1          2
21-APR-21 10.30.46.984000 AM
        83

    MARKID STUDENT_ID SUBJECT_ID
---------- ---------- ----------
DATE_
----------------------------------------------------------------
      MARK
----------

         3          1          3
21-APR-21 10.31.00.325000 AM
        90


SQL>
```

Insertion in Subj_tech Table

```
SQL> INSERT INTO SUBJ_TEACH VALUES (1, 1, 1, 2);

1 row created.

SQL> INSERT INTO SUBJ_TEACH VALUES (2, 2, 2, 2);

1 row created.

SQL> INSERT INTO SUBJ_TEACH VALUES (3, 3, 3, 2);

1 row created.

SQL>
```

```
SQL> SELECT * FROM SUBJ_TEACH;

     ST_ID   GROUP_ID SUBJECT_ID TEACHER_ID
---------- ---------- ---------- ----------
         1          1          1          2
         2          2          2          2
         3          3          3          2

SQL>
```

Check point 2 and Commit

```
SQL> SAVEPOINT SAVEDATA;

Savepoint created.

SQL> COMMIT;

Commit complete.

SQL>
```

Q2:

SOLUTION:

```
SQL> SELECT department_id
  2  FROM
  3  departments
  4  MINUS
  5  SELECT
  6  department_id
  7  FROM
  8  employees
  9  WHERE job_id = 'ST_CLERK';

DEPARTMENT_ID
-------------
           10
           20
           30
           40
           60
           70
           80
           90
          100
          110
          120

DEPARTMENT_ID
-------------
          130
          140
          150
          160
          170
          180
          190
          200
          210
          220
          230

DEPARTMENT_ID
-------------
          240
          250
          260
          270
```

Q3:

SOLUTION:

```
SQL> SELECT
  2    country_id,
  3    country_name
  4    FROM
  5    countries
  6    MINUS
  7    SELECT
  8    x.country_id,
  9    y.country_name
 10    FROM locations x JOIN countries y
 11    ON (x.country_id = y.country_id)
 12    JOIN departments z
 13    ON z.location_id=x.location_id;

CO COUNTRY_NAME
-- ----------------------------------------
AR Argentina
AU Australia
BE Belgium
BR Brazil
CH Switzerland
CN China
DK Denmark
EG Egypt
FR France
IL Israel
IN India

CO COUNTRY_NAME
-- ----------------------------------------
IT Italy
JP Japan
KW Kuwait
ML Malaysia
MX Mexico
NG Nigeria
NL Netherlands
SG Singapore
ZM Zambia
ZW Zimbabwe

21 rows selected.

SQL>
```