CAMBRIDGE
INSTITUTE OF TECHNOLOGY

PART-A
Lab Program 4

Department of
Information Science & Engineering

SUDARSANAN D

www.cambridge.edu.in

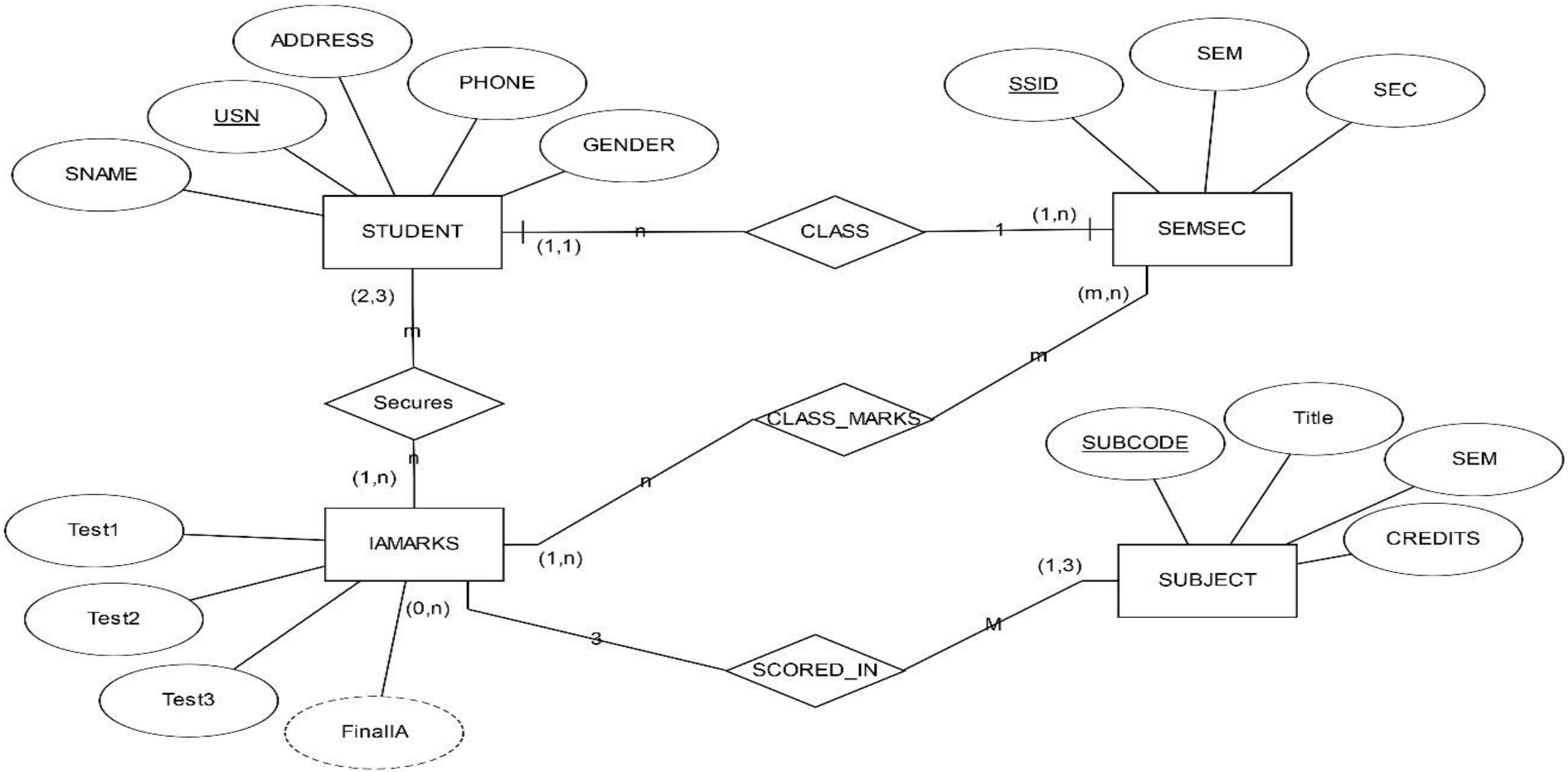
CAMBRIDGE INSTITUTE OF TECHNOLOGY

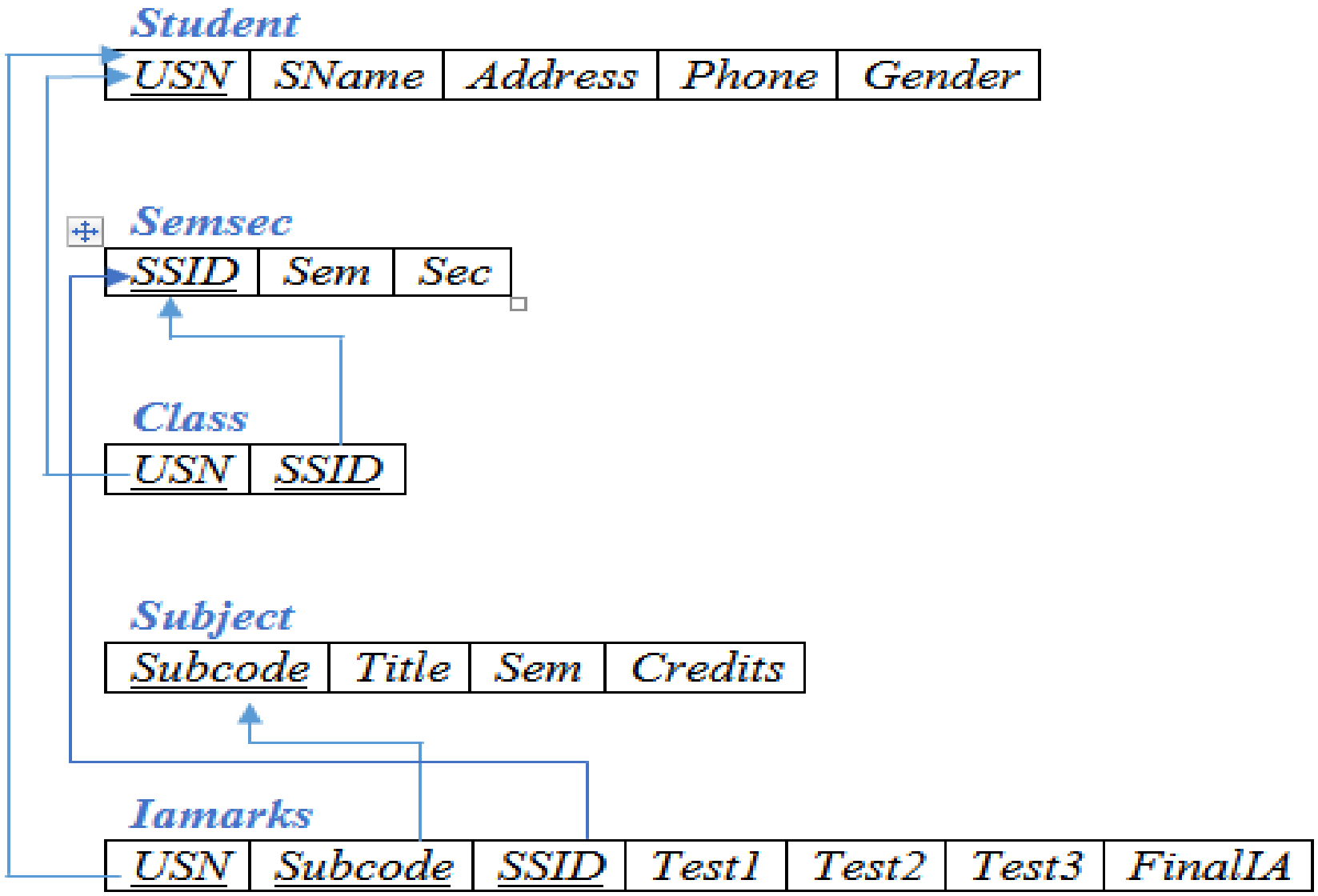
4. Consider the schema for College Database:

STUDENT (*USN, SName, Address, Phone, Gender*)
SEMSEC (*SSID, Sem, Sec*)
CLASS (*USN, SSID*)
SUBJECT (*Subcode, Title, Sem, Credits*)
IAMARKS (*USN, Subcode, SSID, Test1, Test2, Test3, FinalIA*)

Write SQL queries to

1. **List all the student details studying in fourth semester 'C' section.**
2. **Compute the total number of male and female students in each semester and in each section.**
3. **Create a view of Test1 marks of student USN '1BI15CS101' in all subjects.**
4. **Calculate the Final IA (average of best two test marks) and update the corresponding table for all students.**
5. **Categorize students based on the following criterion: If Final IA = 17 to 20 then CAT ='Outstanding' If Final IA = 12 to 16 then CAT = 'Average' If Final IA< 12 then CAT = 'Weak' Give these details only for 8th semester A, B, and C section students.**


ADDRESS
PHONE
USN
GENDER
SNAME
STUDENT
(1,1)
n
CLASS
1
(1,n)
SEMSEC
SSID
SEM
SEC
(2,3)
m
(m,n)
n
Secures
CLASS_MARKS
(1,n)
n
n
Test1
IAMARKS
(1,n)
SUBCODE
Title
SEM
CREDITS
(1,3)
SUBJECT
Test2
(0,n)
3
M
Test3
SCORED_IN
FinalIA


Student
USN
SName
Address
Phone
Gender
Semsec
SSID
Sem
Sec
Class
USN
SSID
Subject
Subcode
Title
Sem
Credits
Iamarks
USN
Subcode
SSID
Test1
Test2
Test3
FinalIA

CAMBRIDGE
INSTITUTE OF TECHNOLOGY

Table Creation

```
CREATE TABLE STUDENT
(
USN VARCHAR (10) PRIMARY KEY,
SNAME  VARCHAR (25),
ADDRESS  VARCHAR (25),
PHONE  NUMBER (10),
GENDER CHAR (1)
);

CREATE TABLE SEMSEC
 (
SSID VARCHAR (5) PRIMARY KEY,
SEM NUMBER (2),
SEC CHAR (1)
);
```

CAMBRIDGE INSTITUTE OF TECHNOLOGY

```
CREATE TABLE CLASS
(
 USN VARCHAR (10),
SSID VARCHAR (5),
 PRIMARY KEY (USN, SSID),
FOREIGN KEY (USN) REFERENCES STUDENT (USN),
FOREIGN KEY (SSID) REFERENCES SEMSEC (SSID)
);

CREATE TABLE SUBJECT
(
   SUBCODE VARCHAR (8),
   TITLE VARCHAR (20),
   SEM NUMBER (2),
   CREDITS NUMBER (2),
   PRIMARY KEY (SUBCODE)
);
```

CAMBRIDGE INSTITUTE OF TECHNOLOGY

```
CREATE TABLE IAMARKS
(
        USN VARCHAR(10),
        SUBCODE VARCHAR(8),
        SSID  VARCHAR(5),
        TEST1  NUMBER(2),
        TEST2  NUMBER(2),
        TEST3  NUMBER(2),
        FINALIA  NUMBER(2),
        PRIMARY KEY (USN, SUBCODE, SSID),
        FOREIGN KEY (USN) REFERENCES STUDENT (USN),
        FOREIGN KEY (SUBCODE) REFERENCES SUBJECT (SUBCODE),
        FOREIGN KEY (SSID) REFERENCES SEMSEC (SSID)
);
```

CAMBRIDGE
INSTITUTE OF TECHNOLOGY

```
INSERT INTO STUDENT VALUES ('1RN13CS020','AKSHAY','BELAGAVI', 8877881122,'M');
INSERT INTO STUDENT VALUES ('1RN13CS062','SANDHYA','BENGALURU', 7722829912,'F');
INSERT INTO STUDENT VALUES ('1RN13CS091','TEESHA','BENGALURU', 7712312312,'F');
INSERT INTO STUDENT VALUES ('1RN13CS066','SUPRIYA','MANGALURU', 8877881122,'F');

INSERT INTO STUDENTVALUES ('1RN14CS010','ABHAY','BENGALURU', 9900211201,'M');
INSERT INTO STUDENT VALUES ('1RN14CS032','BHASKAR','BENGALURU', 9923211099,'M');
INSERT INTO STUDENTVALUES ('1RN14CS025','ASMI','BENGALURU', 7894737377,'F');

INSERT INTO STUDENT VALUES ('1RN15CS011','AJAY','TUMKUR', 9845091341,'M');
INSERT INTO STUDENT VALUES ('1RN15CS029','CHITRA','DAVANGERE', 7696772121,'F');
INSERT INTO STUDENT VALUES ('1RN15CS045','JEEVA','BELLARY', 9944850121,'M');
INSERT INTO STUDENT VALUES ('1RN15CS091','SANTOSH','MANGALURU', 8812332201,'M');

INSERT INTO STUDENT VALUES ('1RN16CS045','ISMAIL','KALBURGI', 9900232201,'M');
INSERT INTO STUDENT VALUES ('1RN16CS088','SAMEERA','SHIMOGA', 9905542212,'F');
INSERT INTO STUDENT VALUES ('1RN16CS122','VINAYAKA','CHIKAMAGALUR', 8800880011,'M');
```

CAMBRIDGE
INSTITUTE OF TECHNOLOGY

```
INSERT INTO SEMSEC VALUES ('CSE8A', 8,'A');
INSERT INTO SEMSEC VALUES (‘CSE8B', 8,'B');
INSERT INTO SEMSEC VALUES (‘CSE8C’,8,’C’);

INSERT INTO SEMSEC VALUES ('CSE7A', 7,’A’);
INSERT INTO SEMSEC VALUES (‘CSE7B’,7,'B’);
INSERT INTO SEMSEC VALUES ('CSE7C',7,'C');

INSERT INTO SEMSEC VALUES (‘CSE6A', 6,'A');
INSERT INTO SEMSEC VALUES (‘CSE6B’, 6,’B’);
INSERT INTO SEMSEC VALUES ('CSE6C’, 6,’C’);

INSERT INTO SEMSEC VALUES (‘CSE5A’, 5,'A’);
 INSERT INTO SEMSEC VALUES ('CSE5B', 5,'B');
INSERT INTO SEMSEC VALUES (‘CSE5C', 5,'C');

INSERT INTO SEMSEC VALUES (‘CSE4A’, 4,’A’);
INSERT INTO SEMSEC VALUES ('CSE4B', 4,’B’);
INSERT INTO SEMSEC VALUES (‘CSE4C’, 4,'C’);
```

CAMBRIDGE
INSTITUTE OF TECHNOLOGY

```
INSERT INTO SEMSEC VALUES ('CSE3A', 3,'A');
INSERT INTO SEMSEC VALUES (‘CSE3B', 3,'B');
INSERT INTO SEMSEC VALUES (‘CSE3C’, 3,’C’);

INSERT INTO SEMSEC VALUES ('CSE2A', 2,’A’);
INSERT INTO SEMSEC VALUES (‘CSE2B’, 2,'B’);
INSERT INTO SEMSEC VALUES ('CSE2C', 2,'C');

INSERT INTO SEMSEC VALUES (‘CSE1A', 1,'A');
INSERT INTO SEMSEC VALUES (‘CSE1B’, 1,’B’);
INSERT INTO SEMSEC VALUES ('CSE1C', 1,’C’);
```

CAMBRIDGE
INSTITUTE OF TECHNOLOGY

```
INSERT INTO CLASS VALUES (‘1RN13CS020’,’CSE8A’);
INSERT INTO CLASS VALUES (‘1RN13CS062’,’CSE8A’);
INSERT INTO CLASS VALUES (‘1RN13CS066’,’CSE8B’);
INSERT INTO CLASS VALUES (‘1RN13CS091’,’CSE8C’);

INSERT INTO CLASS VALUES (‘1RN14CS010’,’CSE7A’);
INSERT INTO CLASS VALUES (‘1RN14CS025’,’CSE7A’);
 INSERT INTO CLASS VALUES (‘1RN14CS032’,’CSE7A’);

INSERT INTO CLASS VALUES (‘1RN15CS011’,’CSE4A’);
INSERT INTO CLASS VALUES (‘1RN15CS029’,’CSE4A’);
INSERT INTO CLASS VALUES (‘1RN15CS045’,’CSE4B’);
INSERT INTO CLASS VALUES (‘1RN15CS091’,’CSE4C’);

INSERT INTO CLASS VALUES (‘1RN16CS045’,’CSE3A’);
 INSERT INTO CLASS VALUES (‘1RN16CS088’,’CSE3B’);
INSERT INTO CLASS VALUES (‘1RN16CS122’,’CSE3C’);
```

CAMBRIDGE INSTITUTE OF TECHNOLOGY

```
INSERT INTO SUBJECT VALUES ('10CS81','ACA', 8, 4);
 INSERT INTO SUBJECT VALUES ('10CS82','SSM', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS83','NM', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS84','CC', 8, 4);
INSERT INTO SUBJECT VALUES ('10CS85','PW', 8, 4);

INSERT INTO SUBJECT VALUES ('10CS71','OOAD', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS72','ECS', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS73','PTW', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS74','DWDM', 7, 4);
INSERT INTO SUBJECT VALUES (‘10CS75','JAVA', 7, 4);
INSERT INTO SUBJECT VALUES ('10CS76','SAN', 7, 4);

INSERT INTO SUBJECT VALUES ('15CS51', 'ME', 5, 4);
INSERT INTO SUBJECT VALUES ('15CS52','CN', 5, 4);
INSERT INTO SUBJECT VALUES ('15CS53','DBMS', 5, 4);
INSERT INTO SUBJECT VALUES ('15CS54','ATC', 5, 4);
INSERT INTO SUBJECT VALUES ('15CS55','JAVA', 5, 3);
INSERT INTO SUBJECT VALUES ('15CS56','AI', 5, 3);
```

CAMBRIDGE
INSTITUTE OF TECHNOLOGY

```
INSERT INTO SUBJECT VALUES ('15CS41','M4', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS42','SE', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS43','DAA', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS44','MPMC', 4, 4);
INSERT INTO SUBJECT VALUES ('15CS45','OOC', 4, 3);
INSERT INTO SUBJECT VALUES ('15CS46','DC', 4, 3);

INSERT INTO SUBJECT VALUES ('15CS31','M3', 3, 4);
INSERT INTO SUBJECT VALUES ('15CS32','ADE', 3, 4);
INSERT INTO SUBJECT VALUES ('15CS33','DSA', 3, 4);
 INSERT INTO SUBJECT VALUES ('15CS34','CO', 3, 4);
INSERT INTO SUBJECT VALUES ('15CS35','USP', 3, 3);
 INSERT INTO SUBJECT VALUES ('15CS36','DMS', 3, 3);
```

CAMBRIDGE
INSTITUTE OF TECHNOLOGY

```
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES ('1RN13CS091','10CS81','CSE8C', 15, 16, 18);
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES ('1RN13CS091','10CS82','CSE8C', 12, 19, 14);
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES ('1RN13CS091','10CS83','CSE8C', 19, 15, 20);
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES ('1RN13CS091','10CS84','CSE8C', 20, 16, 19);
INSERT INTO IAMARKS (USN, SUBCODE, SSID, TEST1, TEST2, TEST3) VALUES ('1RN13CS091','10CS85','CSE8C', 15, 15, 12);
```

1. List all the student details studying in fourth semester ‘C’section.

STUDENT **S**

USN	SNAME	ADDRESS	PHONE	G
1RN13CS020	AKSHAY	BELAGAVI	8877881122	M
1RN13CS062	SANDHYA	BENGALURU	7722829912	F
1RN13CS091	TEESHA	BENGALURU	7712312312	F
1RN13CS066	SUPRIYA	MANGALURU	8877881122	F
1RN14CS010	ABHAY	BENGALURU	9900211201	M
1RN14CS032	BHASKAR	BENGALURU	9923211099	M
1RN15CS011	AJAY	TUMKUR	9845091341	M
1RN15CS029	CHITRA	DAVANGERE	7696772121	F
1RN15CS045	JEEVA	BELLARY	9944850121	M
1RN15CS091	SANTOSH	MANGALURU	8812332201	M
1RN16CS045	ISMAIL	KALBURGI	9900232201	M
1RN16CS088	SAMEERA	SHIMOGA	9905542212	F
1RN16CS122	VINAYAKA	CHIKAMAGALUR	8800880011	M
1RN14CS025	ASMI	BENGALURU	7894737377	F

1

SEMSEC **SS**

SSID	SEM	S
CSE8A	8	A
CSE8B	8	B
CSE8C	8	C
CSE7A	7	A
CSE7B	7	B
CSE7C	7	C
CSE6A	6	A
CSE6B	6	B
CSE6C	6	C
CSE5A	5	A
CSE5B	5	B
CSE5C	5	C
CSE4A	4	A
CSE4B	4	B
CSE4C	4	C

3 4

CLASS **C**

USN	SSID
1RN13CS020	CSE8A
1RN13CS062	CSE8A
1RN13CS066	CSE8B
1RN13CS091	CSE8C
1RN14CS010	CSE7A
1RN14CS025	CSE7A
1RN14CS032	CSE7A
1RN15CS011	CSE4A
1RN15CS029	CSE4A
1RN15CS045	CSE4B
1RN15CS091	CSE4C
1RN16CS045	CSE3A
1RN16CS088	CSE3B
1RN16CS122	CSE3C

2

SELECT S.* , SS.SEM, SS.SEC
FROM STUDENT S, SEMSEC SS, CLASS C
WHERE S.USN = C.USN **AND** SS.SSID = C.SSID **AND** SS.SEM = 4 **AND** SS.SEC=’C’;

USN	SNAME	ADDRESS	PHONE	G	SEM	SSID
1RN15CS091	SANTOSH	MANGALURU	8812332201	M	4	C

CAMBRIDGE INSTITUTE OF TECHNOLOGY

2. Compute the total number of male and female students in each semester and in each section.

```
SELECT SS.SEM, SS.SEC, S.GENDER, COUNT (S.GENDER) AS COUNT
FROM STUDENT S, SEMSEC SS, CLASS C
WHERE S.USN = C.USN AND SS.SSID = C.SSID
GROUP BY SS.SEM, SS.SEC, S.GENDER
ORDER BY SEM;
```

SEM	S	G	COUNT
3	A	M	1
3	B	F	1
3	C	M	1
4	A	F	1
4	A	M	1
4	B	M	1
4	C	M	1
7	A	F	1
7	A	M	2
8	A	F	1
8	A	M	1
8	B	F	1
8	C	F	1

CAMBRIDGE INSTITUTE OF TECHNOLOGY

3. Create a view of Test1 marks of student USN '1CD13IS091' in all subjects.

```
CREATE VIEW STU_TEST1_MARKS_VIEW  AS
SELECT TEST1, SUBCODE
FROM IAMARKS
WHERE USN = '1CD13CS091'
```

TEST1	SUBCODE
15	10CS81
12	10CS82
19	10CS83
20	10CS84
15	10CS85

4.Calculate the FinalIA (average of best two test marks) and update the corresponding table for all students.

```
CREATE OR REPLACE PROCEDURE AVGMARKS IS
CURSOR   C_IAMARKS   IS
SELECT    GREATEST(TEST1, TEST2)       AS        A,
          GREATEST(TEST1,TEST3)        AS        B,
          GREATEST(TEST3,TEST2)        AS        C
FROM IAMARKS
WHERE FINALIA IS NULL FOR UPDATE;

C_A NUMBER;
C_B NUMBER;
C_C NUMBER;
C_SM NUMBER;
C_AV NUMBER;

BEGIN
OPEN C_IAMARKS;
```

C_IAMARKS

A	B	C
16	18	18
19	14	19
19	20	20
20	20	19
15	15	15

```
LOOP
  FETCH C_IAMARKS INTO C_A, C_B, C_C; EXIT WHEN
    C_IAMARKS%NOTFOUND;
  DBMS_OUTPUT.PUT_LINE(C_A || ' ' || C_B || ' ' || C_C);
  IF (C_A != C_B) THEN
  C_SM:=C_A+C_B;
  ELSE
  C_SM:=C_A+C_C;
  END IF;
  C_AV:=C_SM/2;
DBMS_OUTPUT.PUT_LINE('SUM = '||C_SM);
DBMS_OUTPUT.PUT_LINE('AVERAGE = '||C_AV);
UPDATE IAMARKS SET FINALIA=C_AV  WHERE CURRENT OF
C_IAMARKS;

END LOOP;
CLOSE C_IAMARKS;
 END;
/
```

```
SQL> SELECT * FROM IAMARKS;

USN         SUBCODE  SSID       TEST1      TEST2      TEST3      FIN
---------- -------- ----- ---------- ---------- ---------- ------
1RN13CS091 10CS81   CSE8C         15         16         18
1RN13CS091 10CS82   CSE8C         12         19         14
1RN13CS091 10CS83   CSE8C         19         15         20
1RN13CS091 10CS84   CSE8C         20         16         19
1RN13CS091 10CS85   CSE8C         15         15         12
```

Note: Before execution of PL/SQL procedure, IAMARKS table contents are:

SELECT * FROM IAMARKS;

```
SQL> SELECT * FROM IAMARKS;

USN         SUBCODE  SSID       TEST1      TEST2      TEST3    FINALIA
---------- -------- ----- ---------- ---------- ---------- ----------
1RN13CS091 10CS81   CSE8C          15         16         18
1RN13CS091 10CS82   CSE8C          12         19         14
1RN13CS091 10CS83   CSE8C          19         15         20
1RN13CS091 10CS84   CSE8C          20         16         19
1RN13CS091 10CS85   CSE8C          15         15         12
```

Below SQL code is to invoke the PL/SQL stored procedure from the command line:

BEGIN
AVGMARKS;
END;

```
SQL> select * from IAMARks;

USN         SUBCODE  SSID       TEST1      TEST2      TEST3    FINALIA
---------- -------- ----- ---------- ---------- ---------- ----------
1RN13CS091 10CS81   CSE8C          15         16         18         17
1RN13CS091 10CS82   CSE8C          12         19         14         17
1RN13CS091 10CS83   CSE8C          19         15         20         20
1RN13CS091 10CS84   CSE8C          20         16         19         20
1RN13CS091 10CS85   CSE8C          15         15         12         15
```

Categorize students based on the following criterion:
If FinalIA = 17 to 20 then CAT =‘Outstanding’
If FinalIA = 12 to 16 then CAT = ‘Average’
If FinalIA< 12 then CAT = ‘Weak’
Give these details only for 8thsemester A, B, and C section students.

```
SELECT S.USN,S.SNAME,S.ADDRESS,S.PHONE,S.GENDER,
(CASE
   WHEN IA.FINALIA  BETWEEN  17 AND 20  THEN  'OUTSTANDING'
   WHEN IA.FINALIA BETWEEN 12 AND 16 THEN  'AVERAGE'
 ELSE  'WEAK'
END)  AS  CAT
FROM STUDENT S, SEMSEC SS, IAMARKS IA, SUBJECT SUB
WHERE S.USN = IA.USN AND SS.SSID = IA.SSID AND SUB.SUBCODE = IA.SUBCODE
AND SUB.SEM = 8;
```

CAMBRIDGE
INSTITUTE OF TECHNOLOGY

USN	SNAME	ADDRESS	PHONE	G	CAT
1RN13CS091	TEESHA	BENGALURU	7712312312	F	OutStanding
1RN13CS091	TEESHA	BENGALURU	7712312312	F	OutStanding
1RN13CS091	TEESHA	BENGALURU	7712312312	F	OutStanding
1RN13CS091	TEESHA	BENGALURU	7712312312	F	OutStanding
1RN13CS091	TEESHA	BENGALURU	7712312312	F	Average