6.1) Select R_1 sid,

From CATALOG R_1 × CATALOG R_2

Where (R_1.Pid = R_2.Pid) AND

(R_1.Sid = R_2.sid) AND

(R_1.Price > R_2.price);

6.2) Select S.SID

From Suppliers

Where S.address = "RUSTON City" or

(Select p.colour from part p

Where p.colour = "red");

8.1) BCNF FD: {

HScode → HSname, Hsalty

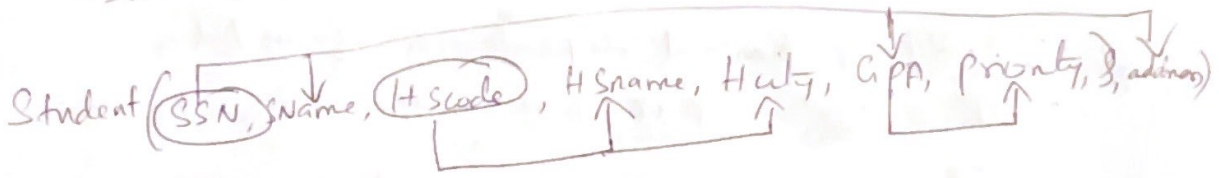
GPA → Priority

SSN → SName, Saddress, GPA

HScode → Hscode, Hsname, Hsalty

GPA → GPA, Priority

SSN → SSN, S.Name, S.address, GPA, Priority



~~GPA~~

SSN Hscode$^+$ = SName, Saddress, GPA, SSN, Hsalty, HScode, Hsname, Priority)

GPA → Priority

→ F_1 (GPA, Priority)

→ R_2 (GPA, Hsalty, Hsname, Hscode, Saddress, Sname, SSN)

SSN → SName, Saddress, GPA, Priority)

R_{21} (SSN, Sname, Saddress, GPA, Priority)

R_{22} (SSN, Hsalty, HSname, HScode, GPA, Priority)

HScode → Hsname, Hsalty

→ R221 (HScode, Hsname, Hsalty)

→ R222 (Hscode, SSN)

Q.2) The checks to be considered on parse tree during query optimization are

(1) Syntactic checks -

IS the syntax of every operator was Correct.

(2) Validity checks: Does every relation name refer to a valid relation.

(3) View expansion: If a relation name refers to a view

(4) Attribute checks:

Does every attribute name refer to a valid attribute

(5) Type checks:

Does each attribute participating in an expression have the proper type?

9.1

S

CWID	Name	Subject	Location	Score
10156731	John	Comp Networks	Ruston	96
10145221	John	DBMS	Ruston	100

R_1

CWID	Name	Subject
10156131	John	Comp Networks
10145221	John	DBMS

R_2

CWID	Location	Score
10156731	Ruston	96
10145221	Ruston	100

$R_1 \cup R_2$

CWID	Name	Subject	Location	Score
10156731	John	Comp networks	Ruston	96
10145221	John	DBMS	Ruston	100

$R_1 \cup R_2 = S$ → (This is satisfied) ✓

$R_1 \cap R_2 \neq \phi$ → " " " ✓

$R_1 \cap R_2 \rightarrow R_1$ ✓ (Anyone should be satisfied)

$R_1 \cap R_2 \xrightarrow{(or)} R_2$ ✗ - (not satisfied)

FD's :

$CWID^+ : CWID, Name, Subject (R1)$

so, this is a Lossless join

9 (2)

R_1

CWID	NAME	Location	Score
10156731	John	Ruston	96
10145221	John	Ruston	100

R_2

Location	Score
Ruston	96
Ruston	100

$R_1 \cup R_2$

CWID	Name	Location	Score
10156731	John	Ruston	96
10145221	John	Ruston	100

$R_1 \cup R_2 = R$ (not satisfied) ×

Here, the first condition, that is not satisfied.

So, this is a Lossy join.

Option B - 1 is lossless but 2 is lossy

9.2) Repost (RID, title, AID, Author, Subject)

RID → title

title → Subject

AID → Author

Step 1: Identifying Partial dependencies from Fd's

RID, AID$^+$ = RID, AID, title, Subject, Author

A → B RID → title → Partial dependency

B → E Title → Subject is a transitive dependency

C → D AID → Author is a partial dependency.

Repost (RID, title, AID, Author, Subject)

Decomposing