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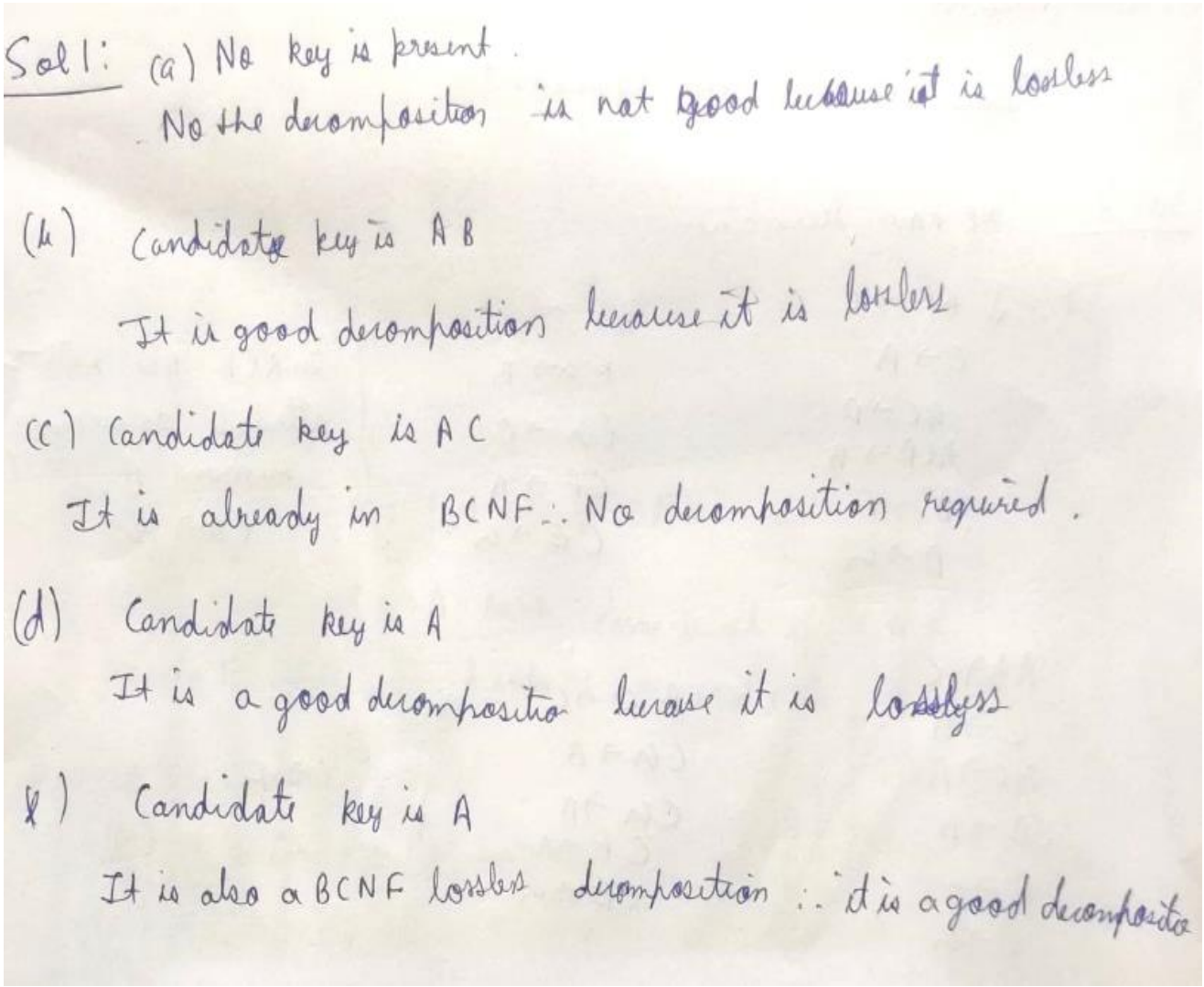
BATCH: B11

DATABASE MANAGEMENT SYSTEM TUT-10,11

Question 1—


Sol 1: (a) No key is present.
No the decomposition is not good because it is lossless

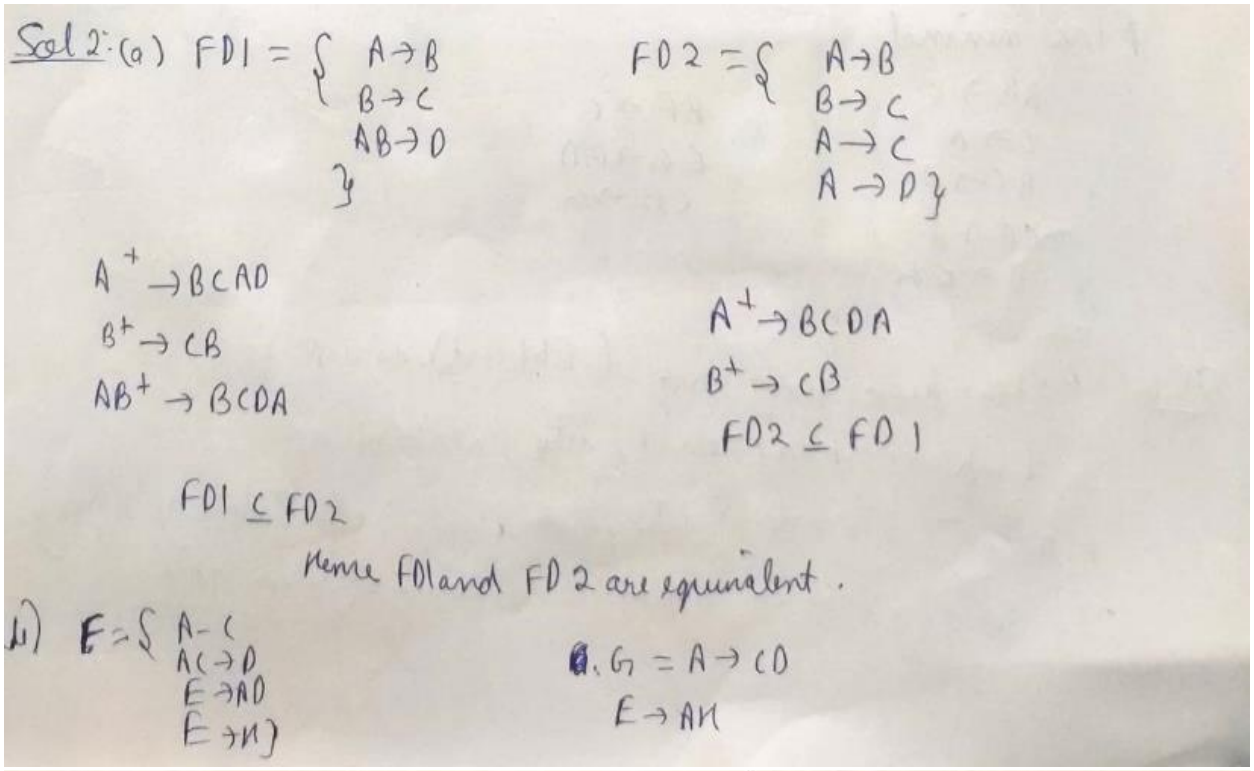
(b) Candidate key is AB
It is good decomposition because it is lossless

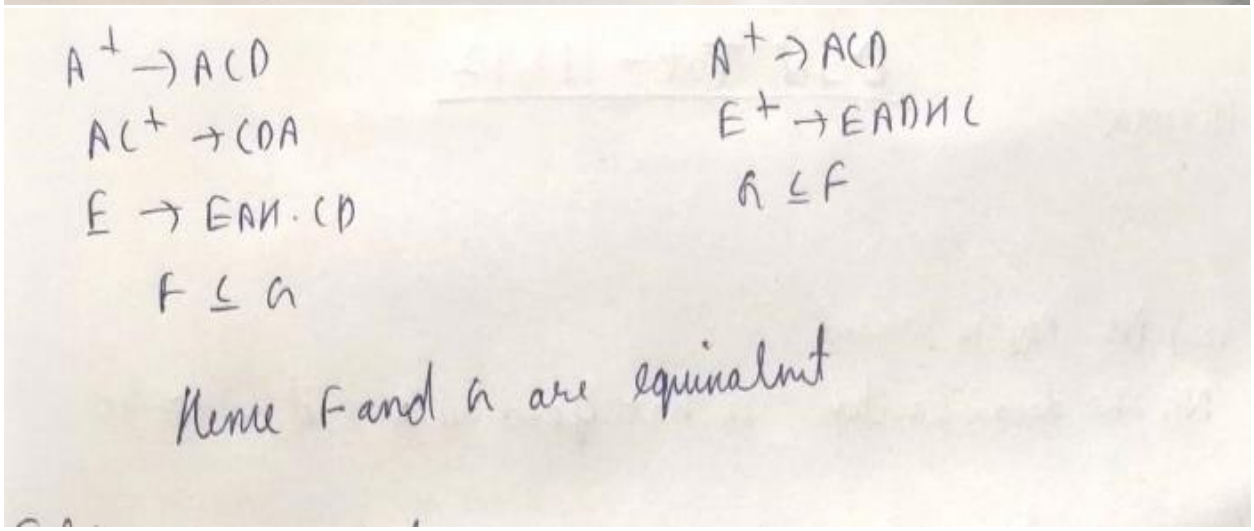
(c) Candidate key is AC
It is already in BCNF ∴ No decomposition required.

(d) Candidate key is A
It is a good decomposition because it is lossless

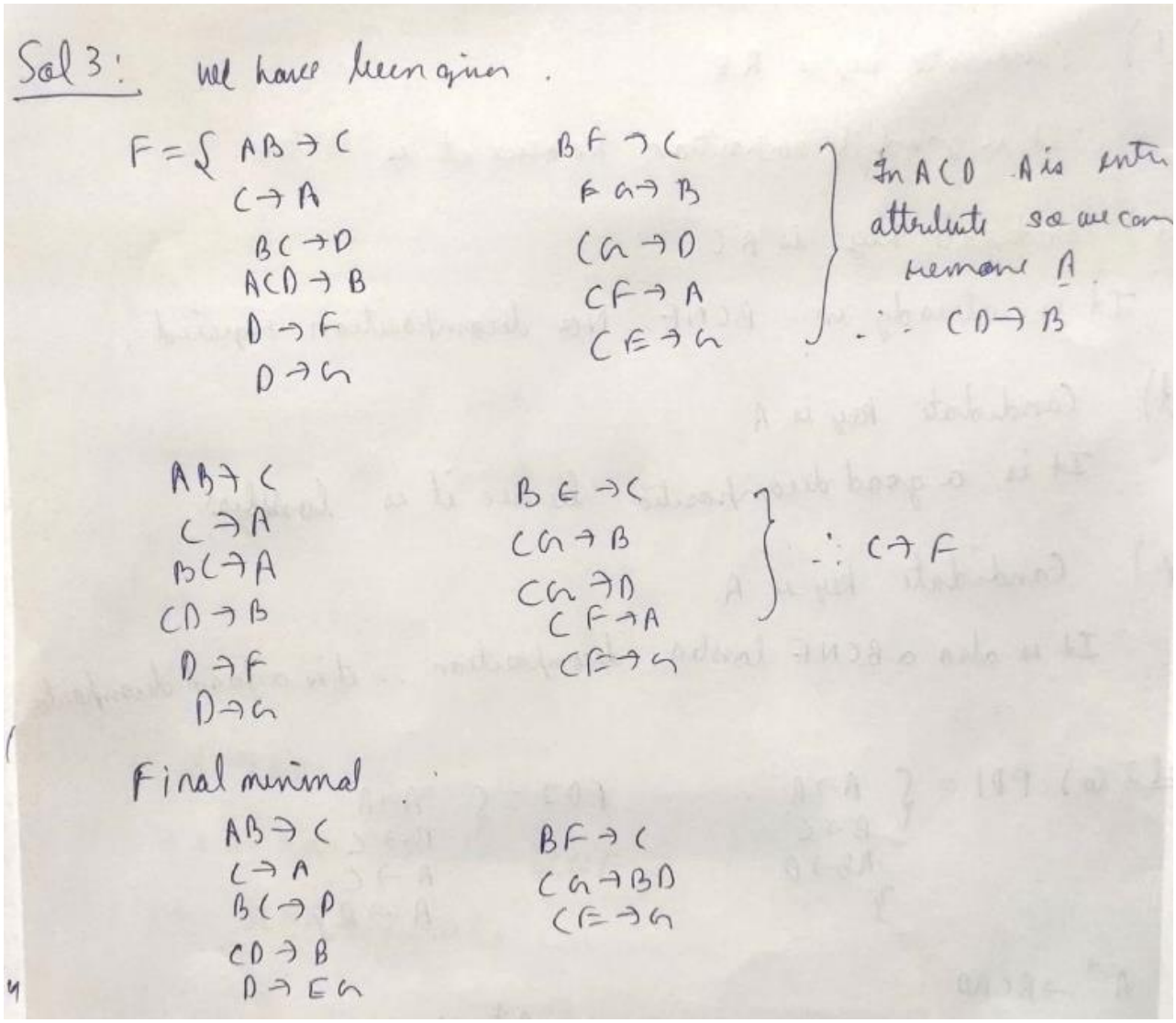
(e) Candidate key is A
It is also a BCNF lossless decomposition ∴ it is a good decomposition

Question 2—

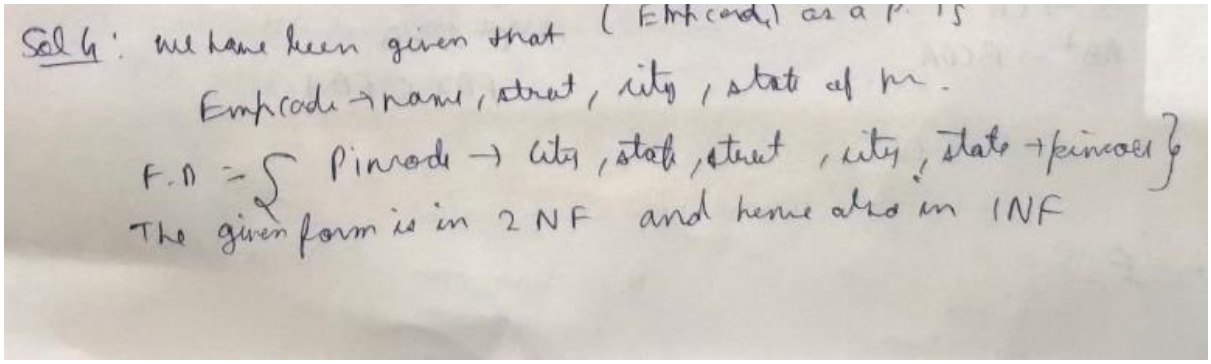

Sol 2: (a) FD1 = { A→B, B→C, AB→D }
FD2 = { A→B, B→C, A→C, A→D }
A+ → BCAD
B+ → CB
AB+ → BCDA
FD1 ⊆ FD2
A+ → BCDA
B+ → CB
FD2 ⊆ FD1
Hence FD1 and FD2 are equivalent.
b) E = { A→C, AC→D, E→AD, E→H }
G = A→CD, E→AH


A+ → ACD
AC+ → CDA
E → EAH. CD
F ⊆ G
A+ → ACD
E+ → EADHC
G ⊆ F
Hence F and G are equivalent

Ques 3—


Sol 3: We have been given.
F = { AB → C
C → A
BC → D
ACD → B
D → F
D → G
BF → C
FG → B
CG → D
CF → A
CE → G
In ACD A is extra attribute so we can remove A.
∴ CD → B
AB → C
C → A
BC → A
CD → B
D → F
D → G
BE → C
CG → B
CG → D
CF → A
CE → G
∴ C → F
Final minimal
AB → C
C → A
BC → D
CD → B
D → EG
BF → C
CG → BD
CE → G

Ques 4—


Sol 4: We have been given that (Empcode) as a P.K is
Empcode → name, street, city, state of pr.
F.D = { Pincode → city, state, street, city, state → pincode }
The given form is in 2 NF and hence also in 1NF

Ques 5—

Sol 5: (1) The highest normal form is 1NF
BCNF (AB, CD, ACF)

(2) The highest normal form is 1NF ∴ BCNF decomposition AB, BF

(3) It is already in BCNF

(4) It is already in BCN

(5) It is already in BCNF

Ques 6—

Soln: (1) (a) $C \cdot K \rightarrow B$

(b) R is in 2 NF but not in 3 NF

(c) $C \rightarrow D$ and $C \rightarrow A$ Both are subset of BCNF

One way to decomposition for R into AC, BC and CD.

(2) (a) $C \cdot K \rightarrow BD$

(b) It is in 1NF not in 2 NF

(c) AD, BC, BD is in BCNF

(3) (a) $C \cdot K \rightarrow ABC, BCD$

(b) R is in 3 NF but not BCNF

(c) No BCNF decomposition

(4) (a) $C \cdot K \rightarrow a$

(b) R is in 2NF but not 3 NF

(c) BCD, ABC in BCNF

(5) (a) $C \cdot K \rightarrow AB, BC, CD, AD$

(b) R is in 3NF but not BCNF

(c) No BCNF decomposition