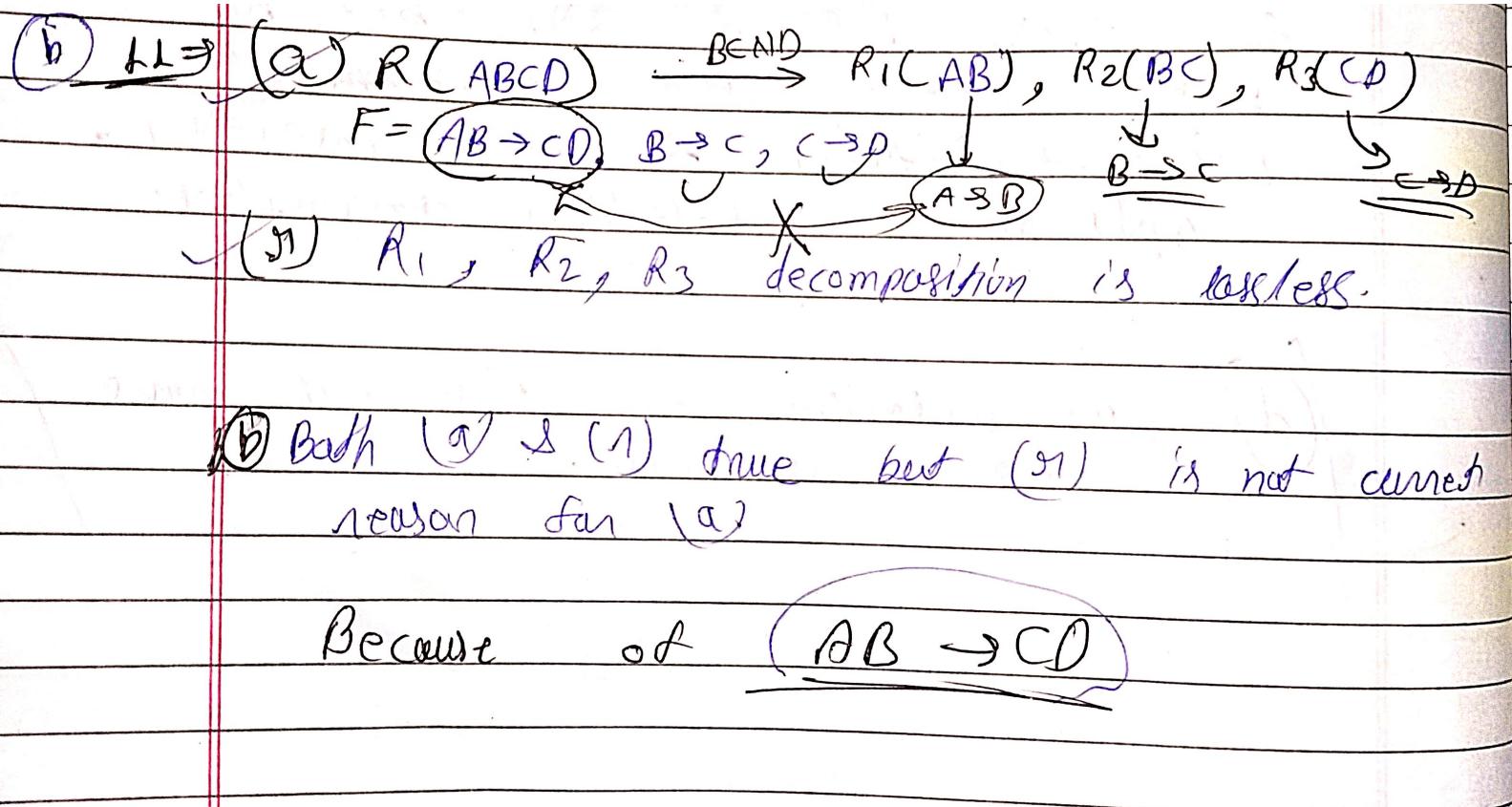


11. Assertion [a]: A relation $R(ABCD)$ and FD set $F = \{AB \rightarrow CD, B \rightarrow C, C \rightarrow D\}$ is decomposed into BCNF as $R_1(AB)$, $R_2(BC)$ and $R_3(CD)$.

Reason [r]: R_1 , R_2 and R_3 decomposition is lossless.

Choose:

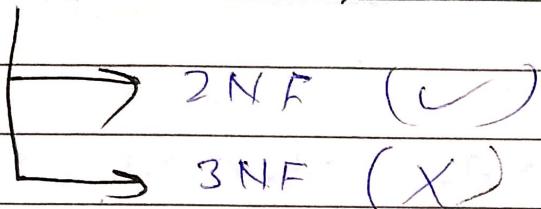
- (a) Both (a) and (r) are true and (r) is the correct reason for (a).
- (b) Both (a) and (r) are true but (r) is not the correct reason for (a).
- (c) Both (a) and (r) are false.
- (d) (a) is true but (r) is false.



12. Find out set of FDs for the relation schema
R(A,B,C,D) with primary key AB under
which R is in 2NF but not in 3NF

- (a) {AB → CD, A → C, C → D}
- (b) {AB → CD, B → C, C → B, A → D}
- (c) {AB → CD, C → D, DB → AC}
- (d) {AB → CD, BC → D}

② $\rightarrow R(ABCD)$, P.K = AB



③ $BC \rightarrow D$ is Transitive Functional dependency:

So, $AB \rightarrow CD$, $BC \rightarrow D$ is 2NF
not 3NF.

13. Business Rules:

- 1. An employee may work in many departments**
- 2. Each employee has a unique employee number**

3. Each department has many managers
4. An employee has only one manager for each department
5. Each manager can manage only one department
6. Each employee has only one Name

The given table is in which normal form?

- (a) 1NF
- (b) 2NF
- (c) 3NF
- (d) BCNF

(b) 237

Rels :-

- (1) An emp. may work in many department.
- (2) Each emp. has unique emp. nub.
- (3) Each department has many managers.
- (4) An emp. has only one manager for each department.
- (5) Each manager can manage only one department.
- (6) Each emp. has only one name.

Transitive

Key → Emp. No.

→ 2NF

(b) 2NF

Data for 14 and 15 are given below. Solve the problems and choose correct answer:

The Given table R(ABCDEF) and FD set
 $F = \{AB \rightarrow CDEF, C \rightarrow A, D \rightarrow B, C \rightarrow D, E \rightarrow F, B \rightarrow E\}$

14. Find out the normal form of above relation R

- (a) 1NF
- (b) 2NF
- (c) 3NF
- (d) BCNF

15. Decompose the above relation R into 3NF.

- (a) (ADC), (DBEF)
- (b) (ABCD), (BEF)
- (c) (ADC), (DB), (BE), (EF)
- (d) (ABCD), (BE), (EF)

Common 14 is 15

$R(ABCDEF)$,

$F = AB \rightarrow CD, EF, C \rightarrow A, D \rightarrow B, C \rightarrow D, E \rightarrow F, B \rightarrow E$

(a) 148

Normal Form -

partial FD

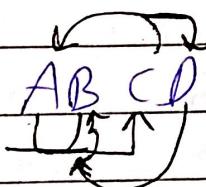
$C \rightarrow AB, AD, C \in B, CD$

1NF

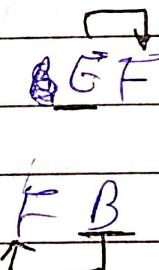
(a) - 1NF

(d) 152

R into 3NF



3NF



3NF

(d) $(ABCD)(EF), (FB) \rightarrow$

3NF

16. A relation $R(ABCDEF)$ and the functional Dependency set $F = \{AB \rightarrow CDEF, B \rightarrow F, A \rightarrow DE, C \rightarrow A, E \rightarrow B\}$ Find out the normal form of the above relation R

(a) 1 NF (b) 2NF
(c) 3 NF (d) BCNF

Q1) \rightarrow

$R(ABCDGF)$

$AB \rightarrow CDEF, B \rightarrow F, A \rightarrow DG, C \rightarrow A, F \rightarrow \eta$

partial FD

GK $\rightarrow AB, AD, C$

(a)

-LNF

17. If $X \rightarrow A$ is FD on a relation and it is not allowed in 3 NF, if

1. X is a proper subset of some key
 2. X is not a proper subset of any key
 3. X is a key
 4. A is a part of some key
- (a) 1 & 3 are correct
- (b) 1 & 2 are correct
- (c) 3 & 4 are correct
- (d) 1 & 2 are not correct

(b) 17

$X \rightarrow A$, — 3NF(X)

if

- (1) $X \subset$ somekey \rightarrow Partial FD
- (2) $X \not\subset$ any key \rightarrow Transitive FD
- (3) X is key
- (4) X is part of somekey

|

(b)

1 & 2 correct

Common Data for Q18, Q19 & Q20 is given below.

Consider the relation for published books

Relation (ABCDEF)

FDs: $A \rightarrow FC$, $C \rightarrow D$, $B \rightarrow E$

18. Find the key of R
- (a) AC (b) AB (c) BC (d) DC
19. Find the 2NF relations
- (a) ACDF, AE (b) ACDF, BE, AB
 - (c) BE, AB (d) ACD, BE, AB
20. Find the 3NF relations
- (a) ACDF, BE, AB
 - (b) ACDF, BE, AB, CD
 - (c) CD, ACF, BE, AB
 - (d) None

Common for 18, 19 & 20.

R(ABCDGF)

FD \Rightarrow A \rightarrow FC, C \rightarrow D, B \rightarrow G

(b) 28 \Rightarrow

Key of R

$$AB^+ = \underline{ABCDEF}$$

(b)

AB is CK

(b) 19 \Rightarrow

2NF relation -

A \rightarrow FC, B \rightarrow G

partial FD

So -

(b)

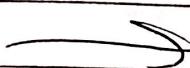
ACDE, BE, AB

\rightarrow 2NF

(c) 20 \Rightarrow

3NF relation -

C \rightarrow D



Transitive

CD, ACF, BE, AB

\rightarrow 3NF