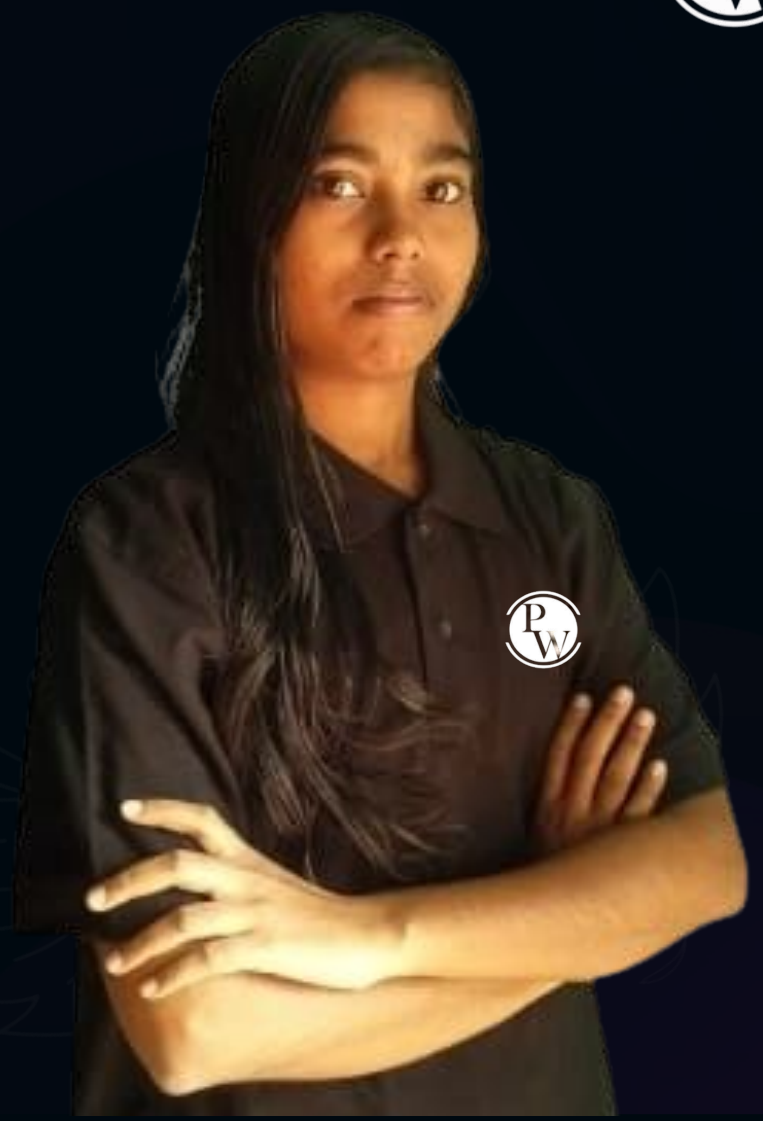
CS & IT ENGINEERING

Database Management System

Relational model and Normal forms



DPP-03

Discussion Notes

By- Mili Dhara Ma'am

[MCQ]

#Q.Assume a relation schema R with 5 attributes P, Q, R, S, T and the set of FD'S $P \rightarrow RS$, $Q \rightarrow RT$, $T \rightarrow Q$ consider the statements:

S_1: The only candidate keys of R are PQ and PT

S_2: The highest normal form satisfied by R is 2NF

Which of the statement is true?

$PQ^+ = \{P, Q, R, S, T\}$

PT^+

P

A Only S_1 is true

B Only S_2 is true

C Both S_1 and S_2 are true

D Neither S_1 and S_2 is true

[MCQ]

#Q.Assume a relation R = (P, Q, R, S) and a set F of functional dependencies:

F = {PR → S, S → P, S → Q, S → R}, Highest normal form satisfied by the relation R is?

$S^+ = \{P, Q, R, S\}$

PR^+

A 2NF

B 3NF

C BCNF

D 1NF

[MCQ]

#Q.Consider a relation R(P, Q, R, S, T, U, V, W) with the following functional dependencies:

{RW→V, P → QR, Q → RUW, T → P, U → TV}, then highest normal form of the relation R is _____.

A 1NF

B 2NF

C 3NF

D BCNF

$P\ S^+ = \{P, Q, R, S, U, W, T, V\}$

TS, US, QS

[MCQ]

#Q.Consider a table/Relation R has only one candidate key, then which of the following is always true?

A. If R is in 2NF, then it is also in 3NF.

B. If R is in 3NF, then it is also in BCNF.

C. If R is in 2NF, but it is not in 3NF.

D. None of the above.

[MCQ]

#Q.Consider a relation R(P, Q, R, S, T) with the set of FD's

{PQR →ST and T → QRS} which of the following statements is true?

A. R is not in 2NF

B. R is in 2NF but not in 3NF

C. R is in 3NF but not in BCNF

D. R is in BCNF

$PQR^+ = \{P, Q, R, S, T\}$

↓

PT

↓

T → S

[MCQ]

#Q.Consider a relation R (L, M, N, O) with the functional dependencies:

$L \rightarrow M$,
$M \rightarrow N$,
$N \rightarrow O$

Which one of the following decompositions is not lossless?

A R_1 (L, M), R_2(M, N), R_3 (N, O)

B R_1(L, M), R_2(L, N), R_3 (L, O)

C R_1(L, O), R_2(M, O), R_3 (N, O)

D All of the above are lossless

[MCQ]

#Q.Given the relation 'R' with attributes PQRST with set of functional dependencies {P → P Q R S T, Q → R} which of the following is / are true?

P

R

X **A** R_1(PRST) R_2(QR) are both in BCNF and preserves lossless join.

P → P R S T Q → R

B R_1(PQST), R_2(QR) are both in BCNF and preserves lossless join

P → Q S T Q → R

X **C** R_1(PST), R_2(QR) are both in BCNF and preserves lossless join.

P → S T Q → R

$R_1 \cap R_2 \neq \phi$

D None of the above.

[MCQ]

#Q. Assume a relation R(P, Q, R, S, T, U) with the following dependencies

1. PQ → RS 2. T → R 3. Q → TU

Q → T ⇒ Q → R
T → R

Given the functional dependencies as shown above which among the following options shows the decomposition of relation R is normalized to 3NF and ensures lossless join and dependency preserving decomposition ?

X **A** $R_1(P, Q, R, S, T, U)$ $R_2(T, R)$ $R_3(Q, T, U)$

PQ → RS, T → R, Q → TU T → R Q → TU

X **B** $R_1(P, Q, R, S)$ $R_2(R, T)$ $R_3(T, U, Q)$

PQ → RS, Q → R T → R Q → TU

X **C** $R_1(P, Q, R, S)$ $R_2(R, T)$ $R_3(Q, T, U)$

PQ → RS, Q → R

D $R_1(P, Q, S)$, $R_2(T, R)$ $R_3(Q, T, U)$

PQ → S T → R Q → TU

[MCQ]

#Q.Assume a relation R(P, Q, R, S, T) with the following functional dependencies {PQ → RST, P → R, Q → S}. Which of the following decomposition of R satisfies lossless join and dependency preserving decomposition into BCNF?

A. R_1 (P, R), R_2(Q, S), R_3(P, Q, R, S, T)

B. R_1(P, R), R_2(Q, S), R_3(P, Q, R, T)

C. R_1(P, R), R_2(Q, S), R_3(P, Q, S, T)

D. R_1(P, R), R_2(Q, S), R_3(P, Q, T)

[MSQ]

#Q.Suppose functional dependency Q → R holds in relation R (P, Q, R, S) which additional FD will make R be in 3NF, but not BCNF?

Q → R
RS → Q

A S → PQ

B PR → S

PSQ

C RS → Q

D PS → Q

THANK - YOU