CS & IT ENGINEERING

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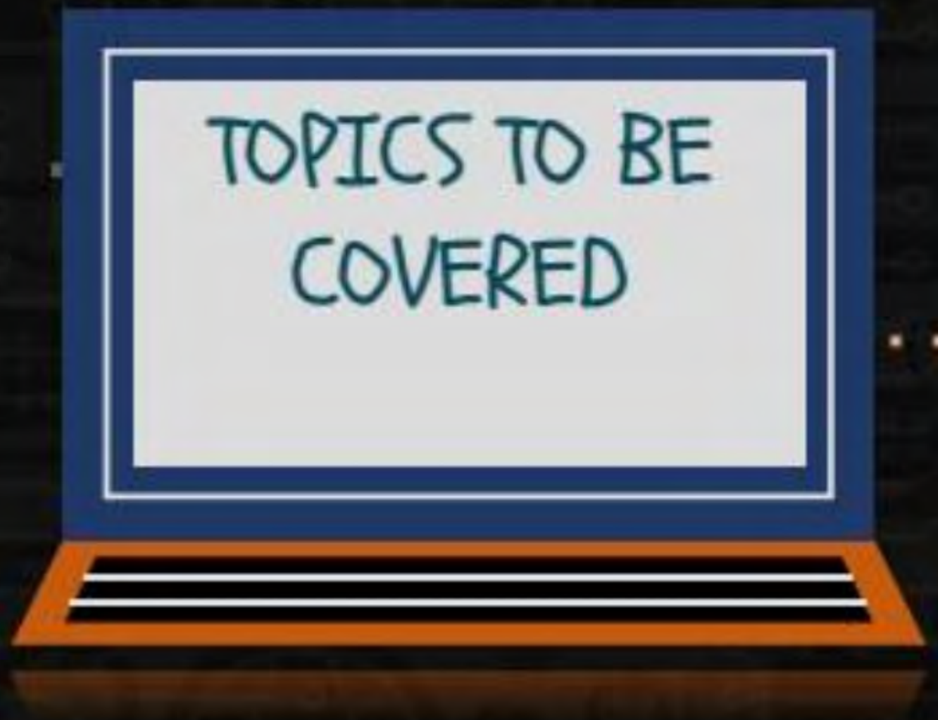
Database Management System

DPP 03

FD's & Normalization

Discussion Notes



01 Question

02 Discussion

Q.1 Consider the relation R (P, Q, R, S, T) and the set of function dependencies F = {P→Q, QR→T, TS→P}. Which of the following is not the candidate key of R? **[MCQ]**

A. RST

B. PRS

C. QRS

D. PQR

R(PQRST) {P→Q, QR→T, TS→P}

Prime Attribute = [S, R, P, T, Q]

YES A. RST

$(PR)^+ = [PQRT]$

YES B. PRS

PS, RS → $(PRS)^+ = [PQRST]$

QR→T

RS, QS → $(QRS)^+ = [QRSTP]$

$(QS)^+ = [QS]$

YES C. QRS

PRS is Candidate key — ①

QRS is Candidate key — ③

$(PQR)^+ = [PQRT]$

D. PQR

If X Attribute → (Prime Attribute)

$(TS)^+ = [TSPQ]$

$(RS)^+ = [RS]$

TS, RS → $(TRS)^+ = [TRSPQ]$

TS→P

TRS is Candidate key — ②

Ans D

Q.2 Assume a relation R (P, Q, R, S, T) with the set of functional dependencies {P→Q, Q→R, R→Q and Q→T}. How many candidate keys are possible in R? ① **[NAT]**

$R(PQRST)$ $[P \to Q,\ Q \to R,\ R \to Q,\ Q \to T]$

Prime Attribute = [P, S]

$[P]^+ = [PQRT]$

$[PS]^+ = [PQRST]$

PS is Candidate key — ①

If $X_{Attribute} \to$ [Prime Attribute]

No multiple Candidate key

Ans (1)

Q.3

Consider the following statements:

S_1: A key in DBMS is an attribute (or) a set of attributes that help to uniquely identify a tuple (or row) in a relation (or table).

S_2: There should be only one candidate key in relation, which is chosen as the primary key.

[MCQ]

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 nor S_2 is true.

True

False

$R(ABCD)$ $[A \to B, B \to C, C \to D, D \to A]$

Candidate key = [A, B, C, D]

Ans (a)

Q.4

Choose the correct statements from the following:

[MSQ]

A. Then minimal set of attributes that can uniquely identify tuple is known as a candidate key.

B. A super key is a group of single or multiple keys that identifies rows in a table. It supports NULL values.

C. Primary key is not a unique key.

D. None of the above.

Ans (a) & (b)

AB is Candidate key
If:
AB is super key
Any super set of AB is also super key

Q.5

Consider a schema with attributes A, B, C, D & E following set of functional dependencies are given, **[MCQ]**

$A \rightarrow B$
$A \rightarrow C$
$CD \rightarrow E$
$B \rightarrow D$
$E \rightarrow A$

$(CD)^+ = [CDEAB]$

$(BC)^+ = [BCDEA]$

$(AC)^+ = [ABCDE]$

Which of the following functional dependencies is implied by the above set?

A. $CD \rightarrow AC$

B. $BC \rightarrow CD$

C. $AC \rightarrow BC$

D. $BD \rightarrow CD$

$(BD)^+ = [BD]$

Ans (A), (B) & (C)

$X \rightarrow Y$ logically implied

$(X)^+$ determines Y

$(X)^+ = (\ldots\ldots Y)$

Q.6

Assume the relation R that has eight attributes ABCDEFGH.

Let A = {CH→G, A→BC, B→CFH, E→A, F→EG} is a set of functional dependencies (FD). How many candidates key does the relation R have? _____.

[MCQ]

Prime Attribute = (D, A, E, F, B)

A. 2

B. 3

C. 4

D. 5

Ans [C]

$[A]^+ = [ABCFHEG]$

$[AD]^+ = [ABCDEFGH]$

AD is Candidate key — (1)

$E \rightarrow A$

$[ED]^+ = [EDABCFGH]$

ED is Candidate key — (2)

$F \rightarrow EG$

$[FD]^+ = [ABCDEFGH]$

FD is Candidate key — (3)

$B \rightarrow CFH$

$[BD]^+ = [ABCDEFGH]$

BD is C.K — (4)

Q.7 Assume the relation schema R(P, Q, R, S, T, U, V, W, X, Y) and the set of functional dependencies on R:

$F = \{PQ \rightarrow R, Q \rightarrow UV, PT \rightarrow WX, W \rightarrow Y, X \rightarrow Z\}$.

Which of the following can be candidate key for R?

[MCQ]

A. PQU

B. PQT

C. PQTR

D. PQTWX

$(PQU)^+ = (PQURV)$

$(PQT)^+ = (PQTUVRWXYZ)$

$\Rightarrow [PQRSTUVWXYZ]$

PQTR → Subset key

PQTWX → Subset key

Ans (B)

Q.8

Consider the following statements:

S_1: Primary key has no duplicate values it has only unique values.

S_2: Primary key may consist of a single column or multiple columns according to data sets.

[MCQ]

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 nor S_2 are true.

Ans(C)

Q.9

Choose the correct statements about candidate key. [MCQ]

A. Candidate key is a super key with maximum attributes.

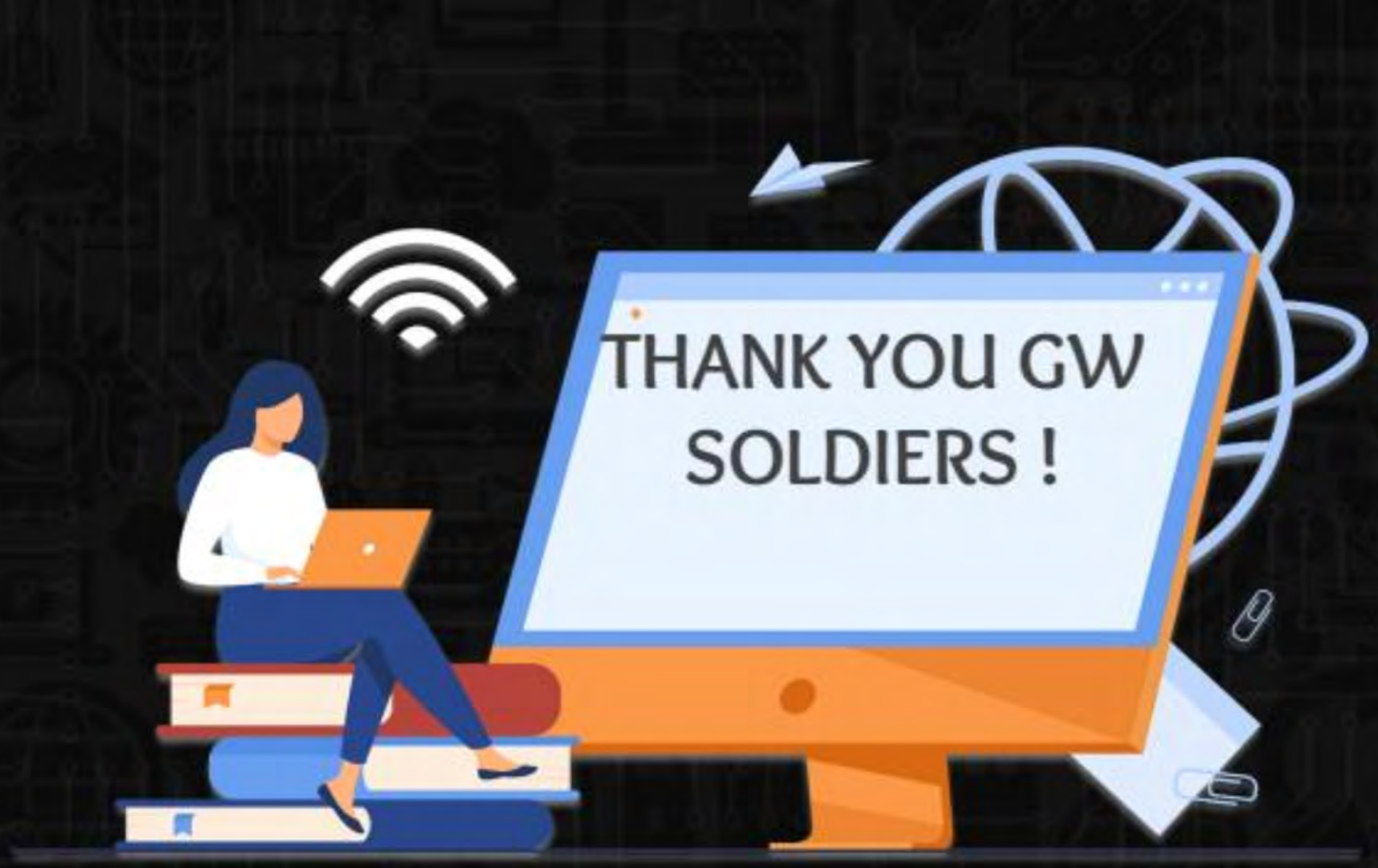
B. It must contain unique values.

C. A table can have multiple CK's but at most one primary key.

D. It is a minimal Super key with no repeated data.

Minimal

Ans (B), (C) & (D)


THANK YOU GW
SOLDIERS !