CS & IT ENGINEERING

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Database

Key Concepts & Finding Number of Candidate keys Part -1

DPP 02

Discussion Notes

01 Question

02 Discussion

Q.1

Choose the correct statement from the following: [MSQ]

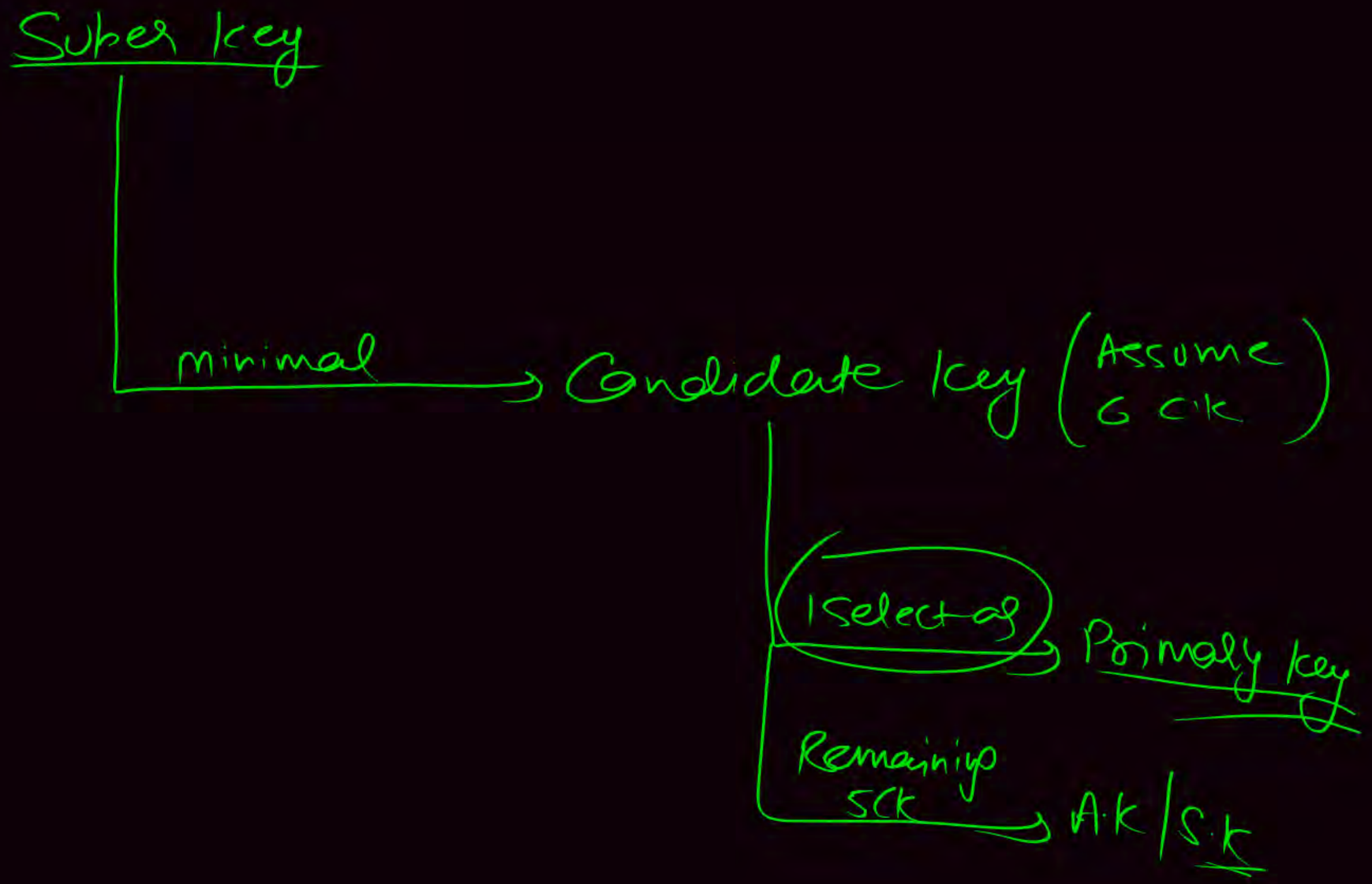
A. There can be many primary keys for a relation.

B. There can be many alternate keys for a relation.

C. All the candidate keys are also super keys.

D. All the super keys are also the candidate keys.

[B] & [C]


Super key
minimal
Candidate key (Assume 6 c.k
Select any
Primary key
Remaining SCK
A.K / S.K

Q.2 [NAT]

Consider the below instance of relation:

Employee:

Emp_rating	Emp_name	Emp_mail	Emp_sal
1	Rohit	p@pw	40000
2	Kanika	c@pw	60000
1	Rohit	Null	50000
3	Pankaj	g@pw	60000

P.k → Not NULL

The maximum possible number of alternate keys for the above relational instance is/are 3.

emp. mail, emp rating emp sal, emp name. emp sal

Q.3

Consider the set of functional dependencies for a relation

R(D, N, C, S)

{D → N, D → C, D → S, C → S}

Ans (A)

Then choose the correct statement regarding the above set. **[MCQ]**

A. {D} is the superkey & Candidate key for the relation.

$[D]^+ = [D\ N\ C\ S]$

D is Candidate key

B. {DN} is the ~~candidate~~ Super key for the relation.

C. {DC} is the ~~candidate~~ key for the relation.

D is super key.

D. {CN} is the superkey for the relation.

$[CN]^+ = [C\ N\ S]$

CN is Not Super key.

Q.4 [NAT]

Consider the given FD set for relation

R (X, Y, Z, W, U, V)

$\{X \rightarrow Y, YZ \rightarrow W, U \rightarrow Z, W \rightarrow X\}$

Then the number of prime attributes for the relation are? **5** Ans

Prime Attribute = [V, U, X, W, Y]

3 C·K
XUV
WUV
YUV

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

$[X]^+ = [XY]$

$[XU]^+ = [XYUZW]$

XU
XV
UV

$[XUV]^+ = [XUVYZW]$

$[XV]^+ = [XVY]$

$[UV]^+ = [UVZ]$

XUV is C·K —①

$W \rightarrow X$

$[WUV]^+ = [WUVXYZ]$

WUV is C·K —②

$YZ \rightarrow W$

$[YZUV]$ < ZUV, YUV

$[ZUV]^+ = [ZUV]$

$[YUV]^+ = [YUVZWX]$

YUV is C·K —③

Q.5

Choose the incorrect statement from the following

[MCQ]

A. All super keys cannot be primary key. → correct

B. We choose the minimal candidate key to be a primary key. → Correct

C. The number of super keys are equal to the number of primary keys for a relation. → In correct

D. None of the above.

Ans [c]

Q.6

Suppose a relation R has 9 attributes, then the maximum possible number of candidate keys are? **[NAT]**

126

n: Number of Attribute

$$\text{Max \# C.k} = {}^{n}C_{\lfloor \frac{n}{2} \rfloor}$$

$$\Rightarrow {}^{9}C_{\lfloor \frac{9}{2} \rfloor}$$

$$\Rightarrow {}^{9}C_{4} \Rightarrow \frac{9 \times 8 \times 7 \times 6 \times 5!}{5! \times 4!}$$

$$\Rightarrow \frac{9 \times 8^{2} \times 7 \times 6}{4 \times 3 \times 2} \Rightarrow 18 \times 7 \sim 126$$

Q.7

For all given set of FD, find the primary key from the options below, for relation R (A, B, C, D, E, F) **[MSQ]**

$\{A \rightarrow D, C \rightarrow BDE, B \rightarrow F, B \rightarrow C\}$

$(A)^+ = [AD]$

$(B)^+ = [BCFDE]$

$(AB)^+ = [ABCDEF]$

Prime Attribute = [A, B, C]

AB is Candidate key — (1)

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

A. AC could be the primary key.

B. There are two candidate keys AC and AB.

C. BC is the primary key.

D. No primary key exists for the relation.

$C \rightarrow BDE$

A, C

$(AC)^+ = [ACBDEF]$

$(C)^+ = [CBDEF]$

AC is CK — (2)

A & B

Q.8 Consider a relation R (A B C D E F), on this relation how many maximum number of candidate keys are possible? **[MCQ]**

A. 8

B. 12

C. 16

D. 20

$$\text{Max } \#Ck = {}^{n}C_{\left(\frac{n}{2}\right)} \Rightarrow {}^{6}C_{\left(\frac{6}{2}\right)} \Rightarrow {}^{6}C_{3}$$

$$\frac{6 \times 5 \times 4 \times 3!}{3! \times 3!}$$

$$\frac{6 \times 5 \times 4}{3 \times 2} = 20$$ Ans

Ans (D)


THANK YOU GW
SOLDIERS !