CS & IT ENGINEERING

Database Management System

DBMS

DPP 01 Discussion Notes

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[MSQ]

#Q. In a relation R(X,Y), we can say that a functional dependency X → Y holds if:

A. All values of X are unique in R

B. All values of Y are unique in R

C. For every pair of tuples in R, if the X values are the same, then the Y values are also the same

D. For every pair of tuples in R, if the Y values are the same, then the X values are also the same

[MCQ]

#Q. Given $A \rightarrow B$, which of the following can be inferred using augmentation?

$X \rightarrow Y$ — true

$XZ \rightarrow YZ$ — true

A. $B \rightarrow A$

B. $AC \rightarrow BC$

C. $C \rightarrow A$

D. $AB \rightarrow C$

[MCQ]

#Q. Relation R(A, B, C, D) has FDs:

$A \rightarrow B$, $A \rightarrow C \Rightarrow A \rightarrow BC \Rightarrow AD \rightarrow BCD$ (augmentation)

$B \rightarrow C$

Which of the following is NOT derivable using Armstrong's axioms?

A. $A \rightarrow C$ $A \rightarrow B \rightarrow C$ Transitivity

B. $A \rightarrow BC$

C. $AD \rightarrow BCD$

D. $C \rightarrow A$

[MCQ]

#Q. Consider relation R(A, B, C, D) with candidate keys: {AB}, {BCD}.

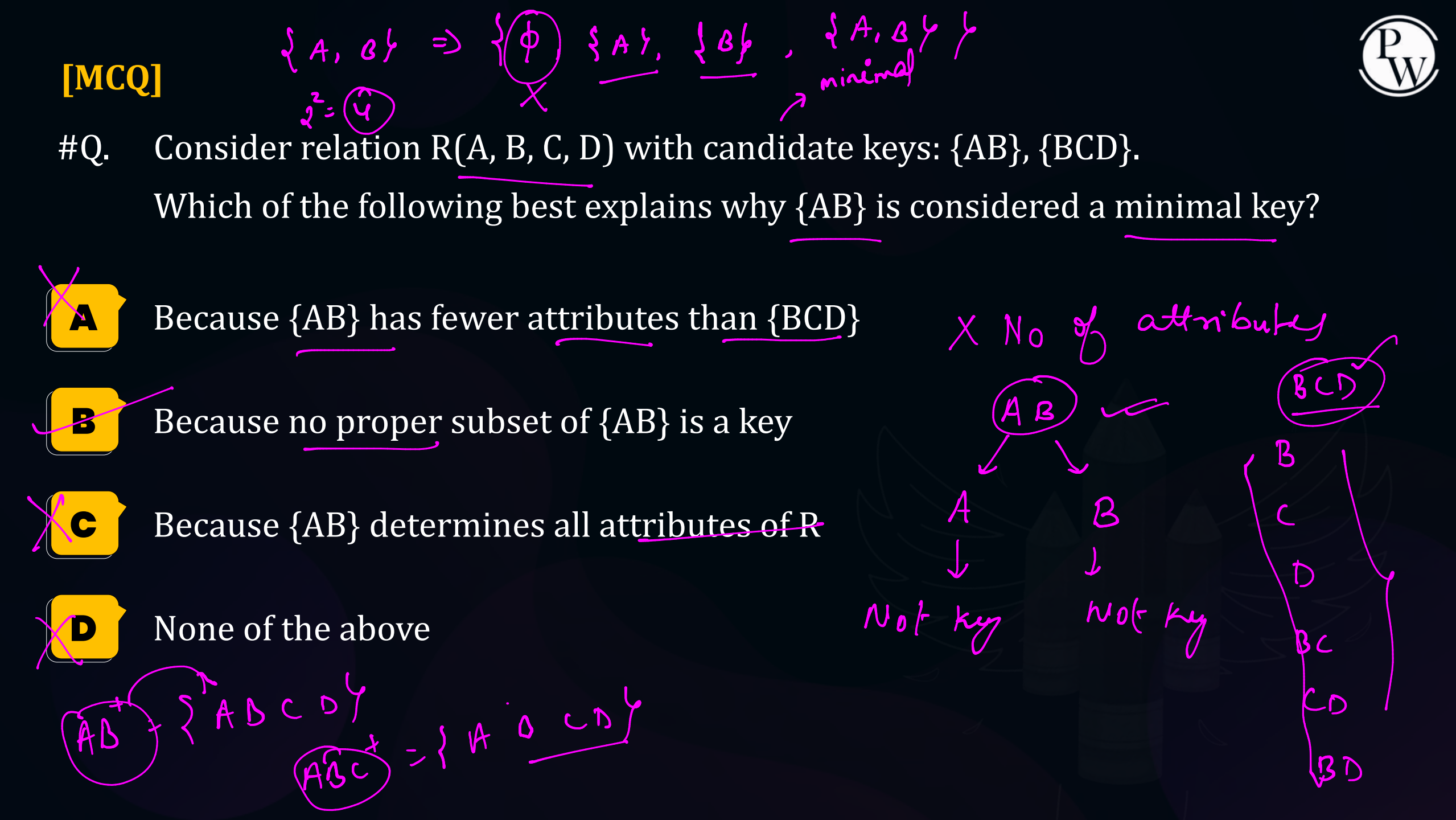
Which of the following best explains why {AB} is considered a minimal key?

A. Because {AB} has fewer attributes than {BCD}

B. Because no proper subset of {AB} is a key

C. Because {AB} determines all attributes of R

D. None of the above



[MCQ]

#Q. Consider a relation R(A, B, C, D) with the following functional dependencies:

$A \rightarrow B$

$C \rightarrow D$

$AC \rightarrow BCD$

$A^+ = \{A, B\}$

$C^+ = \{C, D\}$

$AC^+ = \{A, C, B, D\}$

Which of the following is a candidate key of R?

A. AC

B. A

C. C

D. ABC

AC

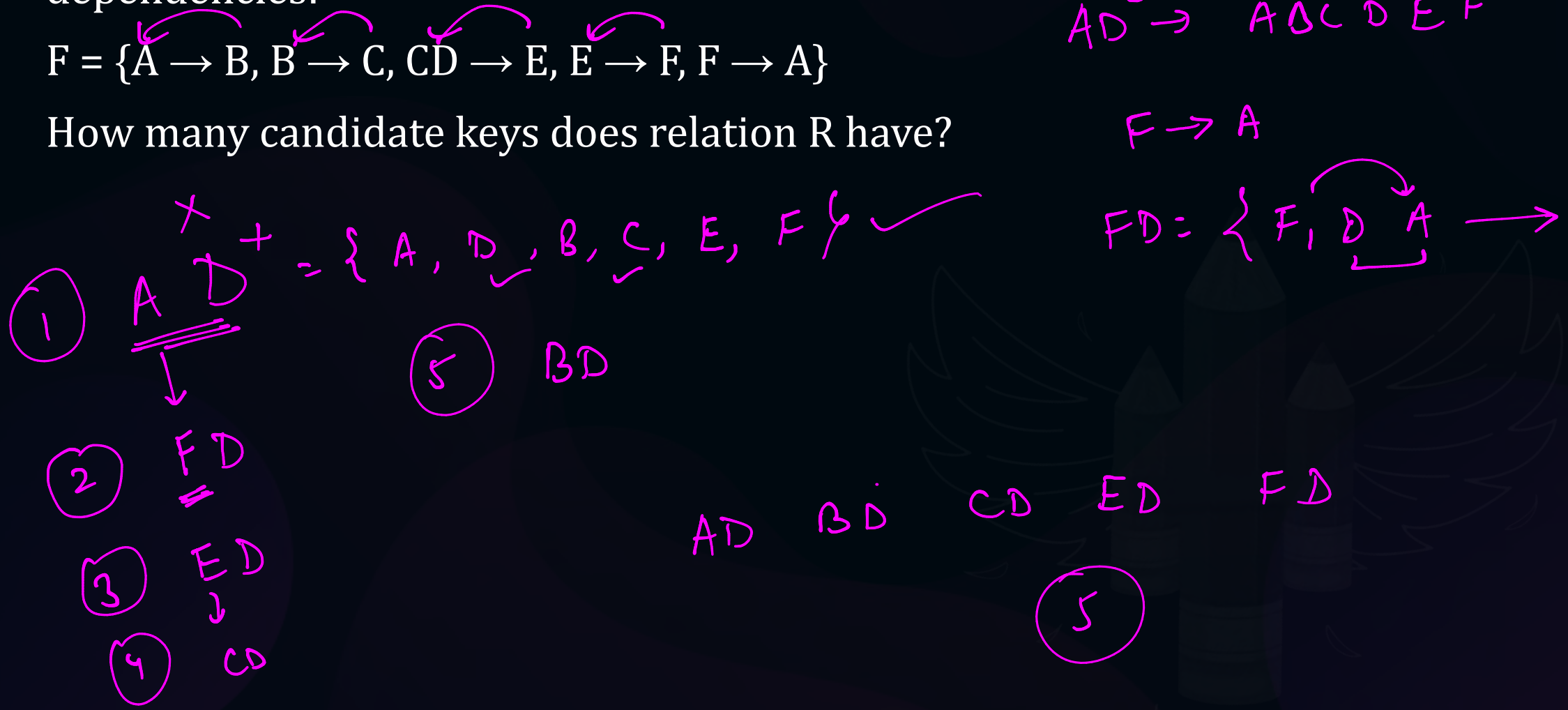
Super key

[NAT]

#Q. Consider a relation R(A, B, C, D, E, F) with the following set of functional dependencies:

$F = \{A \rightarrow B, B \rightarrow C, CD \rightarrow E, E \rightarrow F, F \rightarrow A\}$

How many candidate keys does relation R have?



[MSQ]

#Q. Consider relation Employee(EmpID, Dept, Project, Manager, Location) with the following functional dependencies:

1. EmpID → Dept, Project
2. ~~3.~~ Project, Manager → Location
3. ~~4.~~ Location → EmpID

Which of the following is/are prime attribute of Employee?

(A) Project

(B) Manager

(C) Dept

(D) Location

[MSQ]

Closure of LHS

#Q. Consider a relation R(A, B, C, D, E) with the following set of functional dependencies F:

a. $A \rightarrow B$

b. $B \rightarrow C$

c. $CD \rightarrow E$

$A^+ = \{A, B, C\}$

$BD^+ = \{B, D, C, E\}$

Which of the following FDs is/are NOT the member of F^+ (i.e., implied by the given FD set)?

A. $A \rightarrow C$

B. $A \rightarrow E$

C. $AB \rightarrow C$

D. $BD \rightarrow E$

[MCQ]

#Q. Consider relation R(A, B, C, D, E) with the following two FD sets:

F1:

1. $A \rightarrow BC$
2. $B \rightarrow D$
3. $CD \rightarrow E$

F2:

1. $A \rightarrow B$
2. $A \rightarrow C$
3. $B \rightarrow D$
4. $C \rightarrow E, D \rightarrow E$

Which of the following is correct?

$A \rightarrow B$

$A \rightarrow C$

$CD \rightarrow E$

$C^+ = \{C, \}$

$D^+ = \{D\}$

F_2: $C \rightarrow E$, $D \rightarrow E$

$C^+ = \{C, E\}$

$D^+ = \{D, E\}$

$CD^+ = \{C, D, E\}$

$F_1 \subset F_2$

A F1 and F2 are equivalent (i.e., they imply the same set of FDs)

B F1 $\subset$ F2 (F1 is a subset of F2, but not equivalent)

C F2 $\subset$ F1 (F2 is a subset of F1, but not equivalent)

D F1 and F2 are not comparable

[NAT]

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

a. $P \rightarrow Q$

b. $R \rightarrow S$

c. $P \rightarrow T$

How many superkeys does R have?

superkeys $= 2^3 = 8$

(1) Find CKs

$(PR)^+ = \{P, R, Q, S, T\}$

RHS

Only one CK : PR

THANK - YOU