8.1

 $r_1\cap r_2=A$ and $A o r_1$, which means $r_1\cup r_2 o r_1$, and this decomposition is lossless.

8.13

There is no such a dependency $B \to \alpha$ in F_1^+ and a dependency $\alpha \to D$ in F_2^+ , so the dependency $B \to D$ cannot be preserved by this decomposition.

8.19

(A, B, C, E)

(B, D)

8.20

(A, B, C, E)

(B, D)

A relation in BCNF is also in 3NF.

8.29

a

$$B \rightarrow D \rightarrow AD \rightarrow ABCD \rightarrow ABCDE$$

That is, $B^+ = ABCDE$

b

 $A \rightarrow ABCD \ ({\rm Augmentation \ with \ A})$

 $ABCD \rightarrow ABCDE$ (Augmentation with ABCD)

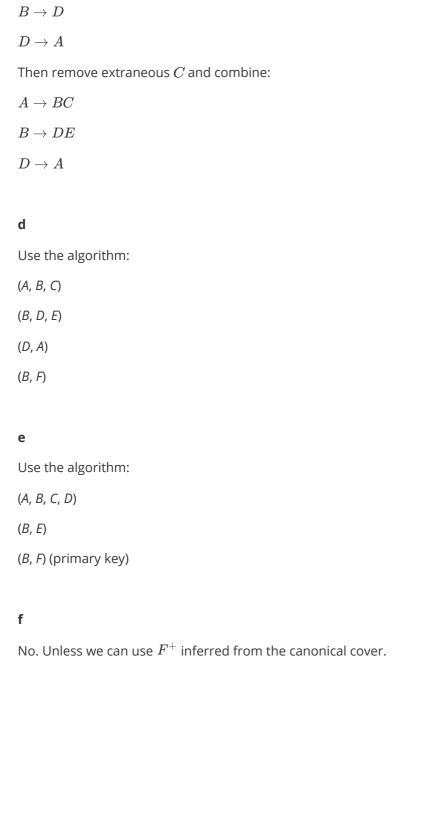
 $A \rightarrow ABCDE$ (Transitivity)

 $AF \rightarrow ABCDEF$ (Augmentation)

C

Remove extraneous D:

 $A \to BC$



 $BC \to E$