1. For each of the following schema decompositions, determine whether or not it is a lossless-join decomposition.
   (a) Schema R(A, B, C, D) with FDs F = {A → BCD, C → D} and decomposition {R1(A, B, C), R2(C, D)}.
   (b) Schema R(A, B, C, D) with FDs F = {A → BCD, C → D} and decomposition {R1(A, C), R2(A, B, D)}.
   (c) Schema R(A, B, C, D, E) with FDs F = {AB → C, AC → D, E → ABCD} and decomposition {R1(A, B, C), R2(A, B, E), R3(A, C, D)}.

2. Consider the schema R (A,B,C,D,E) with FDs
   F = { A → E, AB → D, CD → AE, E → B, E → D }.
   Let δ = {R 1 (B,D,E), R 2 (A,C,E)} be a decomposition of R.
   (a) Is R in BCNF? Explain.
   (b) Is δ a lossless-join decomposition? Explain.
   (c) Is δ in BCNF? Explain.
   (d) If δ is not in BCNF, find a BCNF decomposition of R.

3. Consider the schema R(A, B, C, D, E) with FDs
   F = {AB → CDE, AC → BDE, B → C, C → B, C → D, B → E}.
   Find a BCNF decomposition of R.