Can you please go over the algorithm for testing for lossless join decomposition (that deals with R decomposing to R1, R2, R3, R4, R5)

See the handout from Ullman’s book

Page 224 Theorem 7.3

Example 7.7 on page 225

Example 7.8 on page 228

Complicated example that runs on page 228-229 (figure 7.3, applying algorithm 7.2)

Theorem 7.5 on page 230

Example 7.10 on page 231 (about testing preservation of Functional dependencies)

Example 7.12 on page 234

Example 7.13 (about street, city, zip)

Page 237 on Lossless join decomposition into Boyce-Codd Normal Form

Finally I will cover example7.15 that spans over page 238-241

(similar examples are in your book and associated slides)