2009 Paper 4 Question 7

Databases

(*a*) Define Boyce–Codd Normal Form (BCNF).   [3 marks]

(*b*) Suppose that $R(A, \ B)$ is a relational schema with two attributes, A and B.
Show that this schema must be in BCNF.   [6 marks]

(*c*) Describe a procedure that can take as input any relation schema $R(X)$ together
with functional dependencies F over the attributes of the set X, and return
a decomposition of the input schema where each relation is in BCNF. Make
sure you argue that the procedure is correct and terminates.   [8 marks]

(*d*) Does your BCNF decomposition procedure always preserve all functional
dependencies? Explain your answer.   [3 marks]