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]