**Homework 3**

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Problem 1 (10 Points)**: Given a relation with five attributes R(A,B,C,D,E) and functional dependencies,

AB🡪C, BD🡪E, C🡪D

which of the following does not functionally determine E.

1. BCD
2. BE
3. ABC
4. AC

**Problem 2(25 Points)**: Consider a relation R(A,B,C) with functional dependencies A🡪B, B🡪C. Suppose R already has a tuple (1,1,2), can we insert new tuples (1,1,3), (0,3,3)? Why?

**Problem 3 (30 points)**: Decompose the relation R(A,B,C,D, E) using BCNF. R has the following functional dependencies:

A🡪B, C🡪D, AC🡪E

**Problem4 (35 Points)**: Consider a relation R(A,B,C,D, E) with functional dependencies BDE → A, AC → E, B → C, DE → A. Does any of these FD violate BCNF? why?

If we change R’s functional dependencies to BCD → E, BDE → C, BE → D, BE → A, does any of these FD violate BCNF? why?