**Part A-Normalization and functional dependencies**

Consider the following relation R(A, B, C, D, E) and functional dependencies F that holdover this relation.

F=D→C, A

B, A→C

B→A

C→A

E→A

a) Determine all candidate keys of R.

b) compute the attribute cover of X={C, B} according to F.

c) compute the canonical cover of F, Show each step of the generation according to the algorithm shown in class.

d) in which normal form is relation R(recall that a relation can be in multiple normal forms).

* **2NF**
* **3NF**
* **BCNF**

Use 3NF decomposition algorithm to decompose R into 3NF Ri

**Part B-Concurrency Control**

For each of the following schedules determine which properties this schedule has and provide explanation.

E.g., a schedule may be *recoverable* and *cascade-less* or *conflict or view serializable*. Consider the following notation for operations of transactions:

w1(A) Transaction 1 wrote item A

r1(A) transaction 1 read item A

c1 transaction 1 commits

a1 transaction 1 aborts

S1=r3(B), w2(C), w4(A), w1(C), w2(A), c2, r3(A), c1, c3, c4

S2=r2(A), r1(B), w2(A), r2(B), r3(A), w1(B), c1, w3(A), c3, w2(B), c2

S3=r1(A), r1(B), r2(C), w2(C), w1(B), r2(A), w2(A), c1, w2(B), c2

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