**Instructions:**

1. **Answer all questions.**

1. The three Armstrong axioms are reflexivity, augmentation, and \_*TRANSITIVITY\_\_\_\_\_\_\_\_\_.* 2 pts.

2. Which of the following best captures the inference rule pseudo-transitivity: 2 pts.

X If A→ D and CD→ E, then CA→ E

* If A→ B and CD→ B, then CD→ A
* Both a and b
* None of the above

Given the relation R with attributes ABCDE and the corresponding

FD {A→BC, CD → E, B→ D, E→A}.

Answer the following questions.

3. The FD A→ BC is: 2 pts.

* trivial.

X non-trivial

* Both
* None of the above

4. Determine the primary key of the relation R 2 pts.

**A->BC, B->D so A-> D, so A->DC->E, therefore A-> ABCDE**

**E->A, A-> ABCDE, so E->ABCDE**

**CD->E, so CD -> ABCDE**

**B->D, BC->CD, so BC -> ABCDE**

**We know that a primary key has to be both unique and minimal therefore we have two attributes satisfying the condition namely, A and E.**

**Answer: A or E.**

5: Given the relation R with attributes ABCD, determine the primary key if { D→A, C→BD, AB→C} are the known functional dependencies 2 pts

A+=A

**C+=CBDA**

B+=B

D+=DA

**AB+=ABCD**

AD+=AD

**BD+=ABCD**

primary key could be any of the candidate keys {C. AB, BD}