CSE 462 : Relational Model and Relational Algebra

Name: _____ Date: January 31, 2011

***** Solved in class, on January 31, 2011. *****

1. Consider th e relation instance R below.

A	B	C
1	2	3
1	3	4
2	3	4
2	3	5

a) Specify a schema for this relation, including a minimal key.

b) Based on your answer to **1a)**, explain whether the tuple (2,4,5) can be inserted into R.

c) In how many different ways can R be presented?

2. Consider the relation schema `Employee`(SSN, LastName, FirstName, DoB, Salary, ManagerSSN). Provide a `CREATE TABLE` statement to create this relation using reasonable data types and constraints to guarantee consistency of the relation.

3. Suppose relations R and S have n tuples and m tuples, respectively. Give the minimum and maximum number of tuples that the results of the following expressions can have. Provide your answer in terms of m and n. (Exercise 2.4.7 in the textbook)

	$R \cup S$	$R \cap S$	$R \bowtie S$	$\sigma_\theta(R) \times S$ *	$\pi_L(R) - S$ †
min					
max					

* θ is an arbitrary selection formula. † L is an arbitrary projection list.

4. The following algebraic laws hold for sets but not for bags. For each of the laws, show that they do not hold for bags by providing a counterexample in terms of relation instances R, S, and T. (Based on exercise 5.1.5 in the textbook)

a) $(R \cap S) - T = R \cap (S - T)$

b) $R \cap (S \cup T) = (R \cap S) \cup (R \cap T)$