socrative

Name _____
Date _____

Databases - 2

Score _____

1. $$(\pi_{X,Y}(R1) \div \pi_{X,Y}(R2)) + (R1 - R2)$$

I found a very old version of a book on databases in our library. In this book, I saw a relational algebra expression that might have been tampered by someone. This distorted expression is based on a pair of arbitrary relations $R1(X, Y, Z)$ and $R2(W, X, Y)$. Which of the following are errors (due to tampering) in the said relational algebra expression as shown in the figure?

(A) Division operation is valid if and only if the attributes in the divisor relation (here {*X*, *Y*}) is a proper subset of the attributes in the dividend relation (here {*X*, *Y*})

(B) '+' is not a valid operator in relational algebra

(C) Difference operation is valid if and only if the attributes in both the relations (here {*X*, *Y*, *Z*} for *R*1 and {*W*, *X*, *Y*} for *R*2) are the same

(D) All of the above

2. Let there be two different relations $R1(X, Y)$ and $R2(X, Y)$ having $t1 > 0$ and $t2 > 0$ tuples, respectively. Without making any assumptions, the minimum and maximum possible number of tuples that may appear in the resulting relation provided by the operation $R1 \div \pi_Y(R2)$ is:

(A) Minimum = 0, Maximum = 0

(B) Minimum = 0, Maximum = *t*1

(C) Minimum = 0, Maximum = *t*2

(D) Minimum = *t*1, Maximum = *t*2

3.

$$\text{(i)}\ \ R1 \div (R1 - R2)$$

$$\text{(ii)}\ \ R1 \bowtie_{\theta} R1$$

Which the following relational algebra expressions shown in the figure are always invalid for any arbitrary pair of relations *R*1 and *R*2. Justify your answers.

(A) Both (i) and (ii)

(B) Only (i)

(C) Only (ii)

(D) Neither (i) nor (ii)

4. A union operation is valid on a pair of relations having the same set of attributes but in arbitrary order.

(T) True

(F) False

5. The set of relational algebra operations {σ, π, ∪, ∩, ×} is complete.

(T) True

(F) False

6. $$(R1 \bowtie R2) \cup (R2 \bowtie R1)$$

Let there be two different relations *R*1(*X*, *Y*) and *R*2(*X*, *Y*) having $t1 > 0$ and $t2 > 0$ tuples, respectively. Without making any assumptions, the minimum and maximum possible number of tuples that may appear in the resulting relation provided by the operation in the figure is:

(A) Minimum = 0, Maximum = 0

(B) Minimum = 0, Maximum = min(*t*1, *t*2)

(C) Minimum = 0, Maximum = *t*1 x *t*2

(D) Minimum = *t*1 x *t*2, Maximum = *t*1 x *t*2