CS348 Quiz 3 (LE1) **Name:** _____

PSO: _____

Please fill your answers in the following table:

1	2	3	4	5	6	7	8	9

1. The result of a relational algebra expression is:
   A. an equation.
   B. a relation.
   C. a single value.
   D. a table view.
   E. None of the above.
2. The operation of a relation X, produces Y, such that Y contains only selected attributes of X. Such an operation is :
   A. Intersection.
   B. Join.
   C. Projection.
   D. Union.
   E. Selection .
3. What does the following relational algebra expression return?
   $\sigma_{amount} > {}_{1200}$ (loan)
   A. All the tuples in loan.
   B. All the tuples in loan where the amount is greater than 1200.
   C. All the loan numbers in loan where the number of values is greater than 1200.
   D. Does not return anything.
   E. None of the above.
4. Which of the following relational algebra operations can be expressed using other operations.
   A. Cartesian product.
   B. Division.
   C. Rename.
   D. Select.
   E. Set difference.
5. Which of the following statements is **NOT TRUE:**
   A. UNION: The result of this operation, denoted by R ∪ S, is a relation that includes all tuples that are either in R or in S or in both R and S without duplicates.

B. INTERSECTION: The result of this operation, denoted by R ∩ S, is a relation that includes all tuples that are in both R and S.

C. SET DIFFERENCE (or MINUS): The result of this operation, denoted by R – S, is a relation that includes all tuples that are in S but not in R.

D. CARTESIAN PRODUCT: The result of this operation, denoted by R × S, creates tuples with the combined attributes of two relations.

E. PROJECT: The result of this operation, denoted by π, selects certain columns from the table and discards other columns.

6. What does the following query do?
$\Pi_{CourseId}((\Pi_{StudId}(\sigma_{gender='Female'}(studinfo)) \times \Pi_{CourseId}(enroll)) - enroll)$

A. Courses where there are only female students.

B. Courses where there are no female students.

C. Courses where there are a subset of female students.

D. Courses where there are no male students.

E. Students that are female.

7. Which of the following is **NOT TRUE** about relational algebra?

A. Select and union operations are commutative but project operation is not.

B. If the list of attributes in project operation includes a key, then the result contains all tuples in R.

C. Select, project and union operations *do not* remove duplicate tuples.

D. Rename operation can change both relation name and tuple name.

E. The relations in cross product operation do *not* need to be type compatible.

8. A union operation, ∪, can be performed between which pair of R_1 and R_2?

A. R_1(FirstName, LastName), R_2(FullName)

B. R_1(MidtermGrade) , R_2(FinalGrade)

C. R_1(Name) , R_2(Age)

D. R_1(ProductId, date) , R_2(StudentId, Age)

E. R_1(Age) , R_2(Name)

9. Which of the following is **TRUE** regarding outer join operations and inner join operations?

A. When using inner join operations, tuple with no matching value is replaced with NULL.

B. Outer join is similar to UNION and both of operations should be type compatible.

C. When using outer join operations, tuple with no matching value is replaced with NULL.

D. Outer join operations reserve all tuples and all attributes from both relations.

E. All of the above.