

# 34 Lecture - CS301

## Important Subjective

1. **What is an equivalence relation?**

Answer: An equivalence relation is a binary relation on a set that is reflexive, symmetric, and transitive.

2. **What is the difference between an equivalence relation and a partial order?**

Answer: An equivalence relation is reflexive, symmetric, and transitive, while a partial order is reflexive, antisymmetric, and transitive.

3. **What is an equivalence class?**

Answer: An equivalence class is a set of elements in a set that are related to each other by an equivalence relation.

4. **What is a partition of a set?**

Answer: A partition of a set is a collection of disjoint subsets of the set that together cover the entire set.

5. **What is the relation between an equivalence relation and a partition?**

Answer: An equivalence relation on a set induces a partition of the set into disjoint subsets, where each subset consists of elements that are related to each other by the equivalence relation.

6. **What is the difference between an equivalence relation and a congruence relation?**

Answer: An equivalence relation is a binary relation on a set, while a congruence relation is a binary relation on an algebraic structure such as a ring or a group.

7. **What is an example of an equivalence relation?**

Answer: An example of an equivalence relation is the relation of equality on a set.

8. **What is an example of a non-trivial equivalence relation?**

Answer: An example of a non-trivial equivalence relation is the relation of congruence modulo  $n$  on the integers.

9. **What is an example of a set that cannot be partitioned into equivalence classes?**

Answer: The set of real numbers cannot be partitioned into equivalence classes under any equivalence relation.

10. **How are equivalence relations used in database design?**

Answer: Equivalence relations are used to ensure data integrity and consistency by enforcing constraints on the values that can be stored in a database table.