Test1 Topics CS220

Propositional & Predicate Logic
> Definition of a proposition
> Definition of a predicate
> Logic connectors such as: negation, and, inclusive or, exclusive or, conditional, bi-conditional
> How to prove equivalence using truth tables
> Definition of a tautology, contingency, & contradiction and how to show in a truth table
> Universal quantifier, Existential quantifier
> Equivalences involving negation of universal and existential quantifiers

Rules of Inferences
> Definition of rules of inference
> Use truth tables to determine if a rule of inference is valid or not valid
> Be able to derive a conclusion by applying rules of inferences to the premises

Proof techniques
> Direct Proofs
>> Definition of a direct proof
>> Be able to prove statement using direct proof technique
> Indirect Proofs
>> Contraposition
>>> Know the principles behind a contraposition proof
>>> Be able to prove statement using contraposition proof
>> Contradiction
>>> Know the principles behind a contradiction proof
>>> Be able to prove statement using contradiction proof
> Proof by cases
>> Know the principle behind proof by cases
>> Be able to prove statement using proof by cases

Program Correctness
> Pre and post conditions
> Loop invariants
>> Proof rule for while loops

Sets & Functions
> N, Z, Q, R
> Sets: equivalence, union, intersection, difference, universal set
> Cardinality
> Subsets and Proper Subsets
> Tuples
> Cartesian product
> Power set
> Function
>> Definition
>> Increasing, Strictly increasing
>> Injection, surjection, bijection
>> Composition, inverse