

Discrete Structures

Fall 2015

Midterm Exam Study Guide

The midterm exam will be over the concepts covered in:

- 1. Section 1.1: Propositional Logic**
 - a. You should be able to construct the truth table of any compound propositions.
 - b. You should be able to perform the bitwise logical operations (bit wise OR, AND, XOR).

- 2. Section 1.3: Propositional Equivalences**
 - a. You should be able to show that two compound propositions are equivalent:
 - i. Using Truth table
 - ii. By developing a series of logical equivalences.

- 3. Section 1.4: Predicates and Quantifiers**
 - a. You should be able to evaluate the truth value of propositional functions.
 - b. Expressing propositional function using only negations, disjunctions and conjunctions.
 - c. Negating quantified Expressions.

- 4. Section 1.5: Nested Quantifiers**
 - a. Understanding statements involving nested quantifiers. And the order of quantifiers.
 - b. Negating nested Quantifiers

- 5. Section 1.6: Rule of Inference**
 - a. You should be able to build arguments using rule of inference for propositional logic.
 - b. You should be able to use the rules of inference to show that an argument is valid.

- 6. Section 1.7: Introduction to Proofs**
 - a. You should be able to use a direct proof to proof an argument.
 - b. You should be proof an argument using:
 - i. Direct proof.
 - ii. Proof by contraposition.
 - iii. Proof by contradiction.

- 7. Section 2.1: Sets**
 - a. Be able to define Sets.
 - b. Be able to represent sets graphically using Venn diagrams.
 - c. Be able to define some terminology and notation to express relationship between sets:
subset, proper subset.
 - d. Be able to find the size of the set: set cardinality.

- e. Define power sets.
- f. Find the Cartesian products of two or more sets. $A \times B$.

8. Section 2.2: Set Operations

- a. Define some set operations:
 - i. Union.
 - ii. Intersection.
 - iii. Difference.
- b. Study the most important set identities (table1 page 130 of your text book).