Math 3283: Preparation for Test I

The following is a guide to help you prepare for Test I. There may be questions on the test that are different from the topics mentioned below, but this should help!

1. You should know all of the definitions. For example, if the question is

   Complete the following definition.

   $$\textit{The sequence } \{s_n\} \textit{ has limit } L \textit{ if } \ \ldots$$

   You would write after ...,
   the sequence $\{s_n\}$ *has limit* L *if for every* $\epsilon > 0$ ...

   (or something very similar).

2. You should be able to write statements in abbreviated form (such as those given in Exercise 2.14 on page 12. You should also be able to take a statement given in abbreviated form and translate it back into English.

3. You should be able to give proofs by induction. In presenting a proof by induction, remember to state precisely the statement that you are proving by induction, give separately the Basis Step and the Induction Step, and state the Induction Hypothesis at the appropriate place in the proof.

4. You will be asked to prove at least one of the following:

   Theorem 2.2 (page 32).
   Theorem 2.4 (page 33)
   Theorem 2.5 (page 34)
   Theorem 2.1 (page 49)
   Theorem 2.3 (page 53)

5. You should be able to provide counterexamples to simple statements about sequences. Examples would be those like in Exercise 2.15 (page 57).

6. You should be able to state the main Axioms, Principles, and Theorems, such as the Completeness Axiom, the Principle of Induction, etc.
7. You should be able to use the definition of least uppper bound and greatest lower bound to calculate the least upper bound and greatest lower bound of simple sets. You should be able to use the definition of limit of a sequence to find the limits of simple sequences.