Prepare for the exam by carefully reviewing this list in conjunction with your notes, homework (graded and ungraded problems), and in-class activities.

**Sets:**

1. Memorize and understand the notations $\mathbb{Z}$, $\mathbb{Z}^+$, $\mathbb{Q}$, $\mathbb{Q}^+$, $\mathbb{R}$, $\mathbb{R}^+$.
2. Understand, use the $\in$, $\notin$, $\subseteq$, $\nsubseteq$ symbols, including in true/false or fill-in-the-blank questions.
3. Especially prepare for questions involving $\emptyset$ or power sets.
4. List all subsets of a given set $S$; use correct roster notation to specify $\mathcal{P}(S)$.
5. List all subsets with certain qualities, as in “contain * and $ but neither $\heartsuit \spadesuit$ nor Ohio” from HW.
6. Give examples of proper subsets; determine whether one set is a proper subset of another.
7. Predict how many subsets or proper subsets a given set should have.
8. Given two sets, determine whether either is a subset of the other, and justify, as in HW.
9. Give a FORMAL justification that two sets are equal, as in HW.
10. Know the notation $n(S)$ for cardinality. Predict the cardinality of $A \times B$ or $\mathcal{P}(S)$ for given sets.
11. Given simple sets, determine their $\cup$, $\cap$, $\setminus$, $\times$, or complement, including when 2-3 of these tasks are mixed in a single question, as in $(A \cup B) \cap (C \setminus A)$ or $(A \cap B) \times C^c$.
12. Make up sets whose $\cup$, $\cap$, $\setminus$, $\times$, or complement have certain features, as in HW.
13. Shade a 3-set Venn diagram to represent a given expression involving $\cup$, $\cap$, $\setminus$, or complement.
14. Given an indexing set and a definition for the sets in its family, specify the members of a set with a particular subscript, as in class. Be prepared for the family members to be rosters, intervals, or geometric graphs.
15. Find the union or intersection for a finite range of integer subscripts, as in $\bigcup_{i=-2}^{2} B_i$ or $\bigcap_{\alpha=3}^{10} C_\alpha$.
16. Find the union or intersection of the entire indexed family of sets.

**Sequences**

1. List terms for a sequence given by an explicit formula, as in $a_n = 1 + 2^{-n}$.
2. Find an explicit formula for a given listed sequence.
3. Choose correctly between $(-1)^n$ or $(-1)^{n+1}$ when signs alternate.
4. Given starting and ending values for the index, evaluate sums or products expressed in either sigma, pi, or expanded form.
5. Given a sum or product in expanded form, rewrite using sigma or pi notation.
6. Rewrite a given sigma or pi expression in expanded form showing its first 3 and last 2 terms.
7. Rewrite a given sigma or pi expression via a change of variables, as in p. 184 #48-53.
8. Use and understand factorial notation for numbers or variables ($5!$ vs. $n!$).
9. Expand factorials to simplify expressions involving them.

**Bring a basic calculator for use on the exam - no graphing calculators nor cell phones.**