The final exam is cumulative in that it covers everything we did in class. So the preparation sheets for midterms 1 and 2 are still valid.

1. Read the summary sections of the chapters; they are good for reviewing the concepts and their relationships with each other.

2. Be able to solve the midterms, quizzes and homework problems. The final questions directly related to chapters 1 through 5 are going to be along the lines of midterm and quiz questions on these chapters.

3. From the book, read:
   - Chapter 6, sections 6.1, 6.2 (qualitatively), 6.4.1, 6.4.2 up to eqn. 6.21, figure 6-15, first two subsections of 6.4.3 qualitatively, 6.4.4, 6.5.1, 6.5.2, 6.5.4, 6.5.6, 6.5.7, 6.5.8.
   - Chapter 7, sections 7.1, 7.2, the general flow of but not the exact arithmetics of 7.4.1 and 7.4.2.

4. Look through the self-quiz problems at the end of chapters.

5. Equations you might need will be provided, but obviously it is important that you know what the terms in the equations refer to.

6. Know the derivations we did in class.

7. There might be true/false or fill-in-the-blanks questions about concepts and definitions.

8. Some study questions:
   - What is a transistor?
   - What are the accumulation, flat-band, depletion and inversion regions of operation for the MOS capacitor?
   - What is the threshold voltage? How is it calculated?
   - What type are the source/drain/body regions of an NMOS? Of a PMOS?
   - What is the condition for conduction between the source and drain in an NMOS? In a PMOS?
   - What is the relationship between the drain/source current and gate/source voltage of an NMOS? Of a PMOS?
   - What is the relationship between the drain/source current and drain/source voltage of an NMOS? Of a PMOS?
   - What are the cutoff, linear and saturation regions of operation for the MOSFET?
   - Why and how does saturation start and progress? What is punch-through?
   - How do MOSFETs with short channels behave differently?
   - What are the parasitic capacitances in the MOSFET model?
(l) How does a bias on the MOSFET body affect the threshold voltage?
(m) What is the basic idea behind BJT operation?
(n) What are the current components in a BJT? How are they related to each other?
(o) What are the operation regions of a BJT?

9. Know about the following:
   (a) General manner of JFET operation
   (b) The MOS capacitor band diagram at equilibrium, in accumulation, depletion and inversion
   (c) MOSFET threshold voltage calculation
   (d) MOSFET IV curves
   (e) The threshold voltage and its calculation
   (f) BJT operation regions: cut-off, forward active, reverse active, saturation
   (g) Base transport factor, emitter injection efficiency
   (h) Current transfer ratio, forward current gain