

ECE241

Midterm Study Guide

- The midterm exam is in the second class of week 6.
- **The midterm is a multiple choice exam**
- **You are required to bring a Scantron Form No. 882-E to the exam, where you will record your answers. Use of No. 2 pencil is also recommended.** These are available from the PSU bookstore. You may want to bring an eraser as well.
- Calculators OK
- Closed book/closed notes except for a one page 8.5" x 11" formula sheet (writing on front and back is OK). This sheet should contain formulas only, no worked solutions.

Topics covered are those covered in class from Svoboda and Dorf Chapters 1 to Chapter 5. The list of topics is given in the ECE241 syllabus as Group 1, all items, and Group 2, items 1- 4 and 7.

Main skills you should have:

- 1) Understand resistors, conductances, Ohm's law
- 2) Be able to determine power in a component (resistor or source) and whether it is absorbed or delivered
- 3) Be able to apply KVL and KCL in the analysis of circuits containing resistors and sources (both independent and dependent voltage and current sources)
- 4) Be able to find the equivalent resistance of resistors connected in series and/or parallel.
- 5) Be able to apply the resistor voltage and current divider rules in circuit analysis
- 6) Be able to perform nodal analysis of circuits containing resistors and sources (both independent and dependent voltage and current sources)
- 7) Be able to perform mesh analysis of circuits containing resistors and sources (both independent and dependent voltage and current sources)
- 8) Be able to use source transformation in the analysis of circuits
- 9) Be able to find the Thevenin representation of a circuit
- 10) Be able to find the Norton representation of a circuit
- 11) Be able to apply the maximum power transfer theorem
- 12) Be able to use superposition in the analysis of circuits
- 13) Be able to find the equivalent capacitance of capacitors connected in series and/or parallel.
- 14) Be able to find the equivalent inductance of inductors connected in series and/or parallel.
- 15) Be able to find the DC steady state inductor current or capacitor voltage in a first order circuit.