Fields and Waves I

Name _____   ECSE-2100   Spring 2000   Sec____

Preparation Assignments
Due at the start of class.
These assignments will only be accepted from students attending class.

Reading Assignments
Please see the handouts for each lesson for the reading assignments.

2,3 March Lessons 3.6, 3.7 and 3.8 Magnetic Materials, Magnetic Circuits, Magnetic
Energy and Force

1. Roughly sketch the magnetic field lines you would expect to find around a simple
rectangular magnet. You do not have to be perfect, but you should be neat.

2. What is the reluctance of a bar of magnetic material with permeability $m = 1000m_o$,
length 10 cm, width and height 2 cm?

3. If you have an inductor L carrying a constant current I, how much energy is being
stored?

4. Do parallel wires each carrying a current I in the same direction repel or attract one
another?

6 March Lessons 5.1 and 1.5 (Problem 2) Maxwell's Equations and Phasors

1. Write out the complete form of Maxwell's Equations in time-varying point form
showing all terms.

2. Write out the complete form of Maxwell's Equations in phasor point form, showing all
terms.

3. If $V_o e^{jq}$ is a phasor voltage, write out the voltage that you would observe using an
oscilloscope. Assume that the frequency is 10kHz.

4. What is the purpose of a commutator in a DC motor?