

Physics 142 - Fall 2014 - Problem Set 10

- ① Is it possible to magnetize an iron needle by pointing it North and giving it a few blows with a hammer? Explain
- ② A current of 25 A flows in a long solenoid of 1500 turns per meter.
 - (a) if interior of solenoid is a vacuum, what is the strength of the magnetic field?
 - (b) if the interior of the solenoid is filled w/ liquid oxygen while the current stays constant, what will be the percentage change of the magnetic field?
- ③ Show that the self-inductance per unit length of a very long solenoid filled w/ a paramagnetic material is $k_m \mu_0 n^2 \pi R^2$, where n is the number of turns of wire per unit length and R is the radius of the solenoid.

- ④ 32-1
- ⑤ 32-34
- ⑥ 32-77

- ⑦ 32-52
- ⑧ 32-53
- ⑨ 33-3
- ⑩ 33-7

- ⑪ 33-13