Physics 142 - Fall 2007 - Problem Set 9

(1) question 32-8, p.1058

(2) 32-2

(3) 32-32

(4) 32-42

(5) 32-76

(6) Is it possible to magnetize an iron needle by pointing it North and giving it a few blows with a hammer? Explain

(7) 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?

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(8) 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.

(9) 32-1

(10) 32-34

(11) 32-77

(12) 32-52

(13) 32-53

(14) 33-3

(15) 33-7

(16) 33-13