

Dec. 22, 2012

EE214000 Electromagnetics, Fall, 2012

Homework#7,

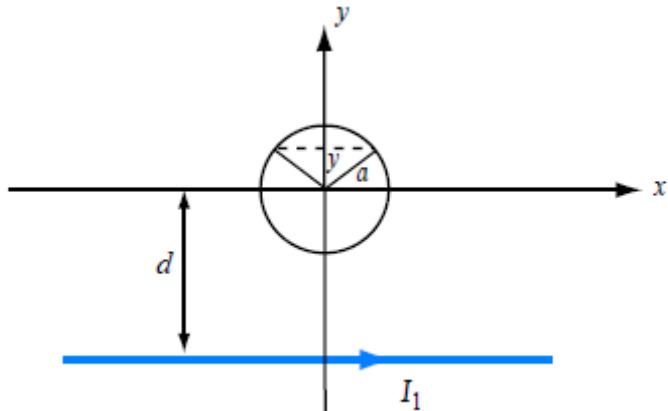
Problems 1-9 due in class, Wednesday, Dec. 26, 2012

Problem 10 due on Monday, Dec. 31st, 2012 (turn in electronically)

Total credit points = 120

Problem 1 A solenoid is a stack of current loops. (1) Given the expression of the magnetic field at the center of a current loop in EXPAMPLE 6-6, would you be able to derive an expression for the solenoid field in EXAMPLE 6-3? (5 points) (2) Use Eq. (6-65) and correct interpretation to derive the solenoid field Eq. (6-14). (5 points)

Problem 2 Determine the mutual inductance between the circular loop and the linear current shown in the following. (5 points)



Problem 3 P. 6-10 in Cheng's textbook. (5 points)

Problem 4 P. 6-18 in Cheng's textbook (20 points)

Problem 5 P. 6-22 in Cheng's textbook (10 points)

Problem 6 P. 6-27 in Cheng's textbook. (15 points)

Problem 7 Refer to Example 6-16 in your textbook. Assume the air part of the coaxial cable is now filled with a magnetic material having a permeability of μ and the outer conductor has thickness between $b < r < b + d$. What is the self inductance per unit length of this coaxial cable? (10 points)

Problem 8 P.6-53 in Cheng's textbook.(5 points)

Problem 10 Visit the electronics stores again to learn about different inductors and magnetic circuits/switches. Email the TA (dk0933304592@hotmail.com) and me

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(ychuang@ee.nthu.edu.tw) a pdf file for this problem. (40 points)