

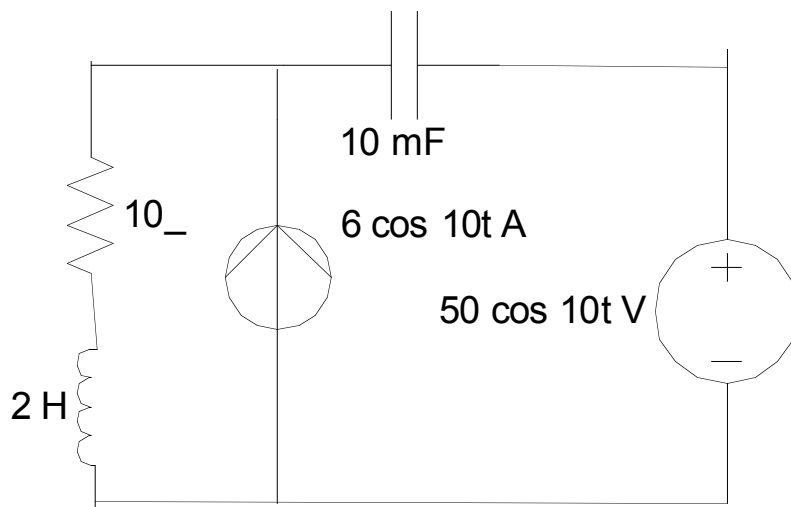
EECS 40, Fall 2007
Prof. Chang-Hasnain

Homework #5

Due at 5 pm in 240 Cory on Thursday, 10/18/07

Total Points: 100

- Put (1) your name and (2) discussion section number on your homework.
 - You need to put down all the derivation steps to obtain full credits of the problems. Numerical answers alone will at best receive low percentage partial credits.
 - No late submission will be accepted expect those with prior approval from Prof. Chang-Hasnain.
 - Problems of this HW are from Hambley 4th Edition
1. (Power in AC circuits) P5.62, P5.66, and P5.67 (11 points)
 2. (Power in AC circuits) P5.70 (12 points)
 3. (Power in AC circuits) (17 points) Determine the complex power of the R, L, and C elements, and show that the complex power delivered by the sources is equal to the complex power absorbed by the R, L, and C elements.



4. (Transfer functions) (6 points)
 - a. Find the sum of the transfer function given in eq 6.9 (p 280) and that in eq 6.21 (p 292), and explain.
 - b. Find the sum of 6.10 and 6.23 and explain why this is different from your answer to part (a).
5. P6.23 (First order lowpass filter) (4 points)
6. P6.25 (First-order lowpass filter) (12 points)

7. P6.31 (First order lowpass filter) (10 points)
8. (Decibels, Logarithmic Frequency Scales) (10 points)
 - a. P6.42
 - b. P6.44
 - c. P6.46
9. (Bode plots) (8 points) Consider $H(f) = jfA/(B+jfC)$. Find
 - (a) the corner frequency
 - (b) the slope of the asymptotic magnitude Bode plot for f above the corner frequency in decibels per decade
 - (c) the slope of the magnitude Bode plot below the corner frequency
 - (d) the gain for f above the corner frequency in decibels.
10. P6.55 (Bode plots) (10 points)