ENSC 220 – Assignment #7 (given Dec 5th, 2005)

1.

11.5 Find the rms value of the periodic current shown in Fig. P11.5.

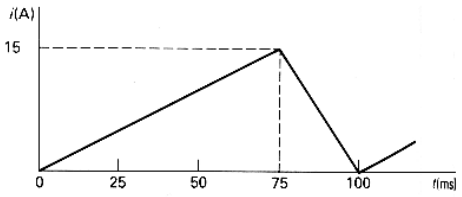

FIGURE P11.5

2.

.12 Find the average power delivered by the ideal current source in the circuit in Fig. P11.12 if $i_g = 10 \cos 25{,}000t$ mA.

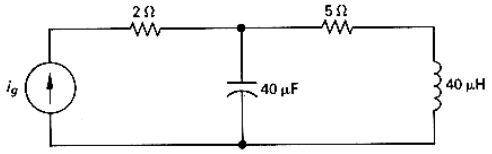

FIGURE P11.12

3.

11.17 Three loads are connected in parallel across a 480-V (rms) line as shown in Fig. P11.17. Load 1 absorbs 25 kW and 25 kVAR. Load 2 absorbs 15 kVA at 0.8 pf lead. Load 3 absorbs 11 kW at unity power factor.

a) Find the impedance that is equivalent to the three parallel loads.

b) Find the power factor of the equivalent load as seen from the line's input terminals.

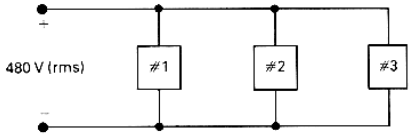

FIGURE P11.17

4.

17.29 a) Derive the numerical expression of the transfer function I_o/I_g for the circuit in Fig. P17.29.

b) Make a corrected amplitude plot for the transfer function derived in part (a).

c) At what frequency is the amplitude maximum?

d) What is the maximum amplitude in decibels?

e) At what frequencies is the amplitude down 3 dB from the maximum?

f) What is the bandwidth of the circuit?

g) Check your graphical results by calculating the actual amplitude in decibels at the frequencies read from the plot.

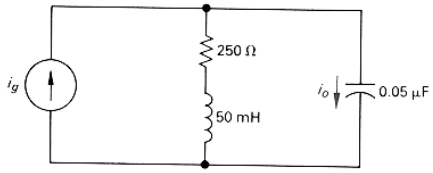

FIGURE P17.29

5.

17.31 Given the following current transfer function:

$$H(s) = \frac{V_o}{V_i} = \frac{10^8}{s^2 + 3000s + 10^8}.$$

a) At what frequencies (in radians per second) is the ratio of V_o/V_i equal to unity?

b) At what frequency is the ratio maximum?

c) What is the maximum value of the ratio?

6.

17.34 The amplitude plot of a transfer function is shown in Fig. P17.34. What is the numerical expression for $H(s)$?

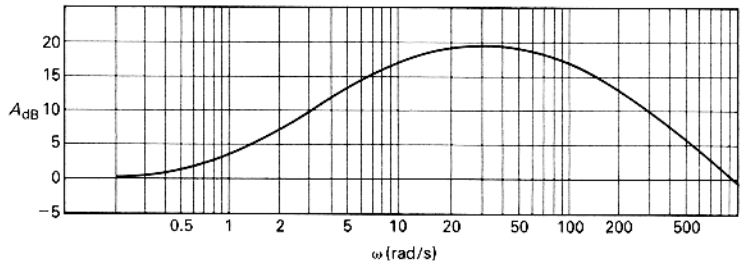

FIGURE P17.34