

1. Please find: (a) the Norton equivalent circuit of the circuit shown in Figure 1; [15] b) if a load is connected to the terminal A-B, please find the maximum power that can be delivered to the load. [5]
2. The switch in Figure 2 has been in position A for a long time. At $t=0$, it moves to position B. Please find the capacitor voltage $v_c(t)$ and inductor current $i_L(t)$ for $t \geq 0$. [30]
3. An AC source v_{ac} , $110V_{rms}$ $60Hz$, is providing power for an RLC load as shown in Figure 3. Please determine: (a) real power, (b) reactive power, and (c) apparent power provided by the AC source. And (d) the power factor of the RLC load. [10]
4. Please determine the RMS (root-mean-square) value of the triangular waveform shown in Figure 4. [10]
5. For the circuit shown in Figure 5, please derive its the frequency domain voltage gain $G_v(\omega) = v_o(\omega)/v_i(\omega)$. [15] (b) Draw the bode plot of $G_v(\omega)$, both magnitude and phase, with important values and points marked. [15]

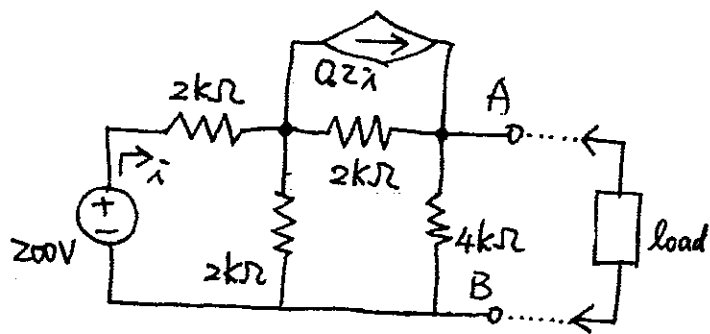


Figure 1

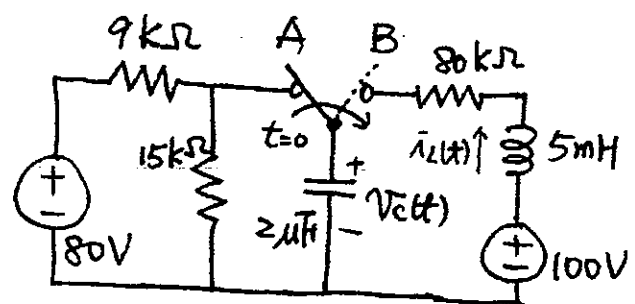


Figure 2

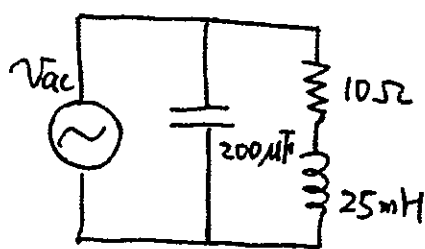


Figure 3

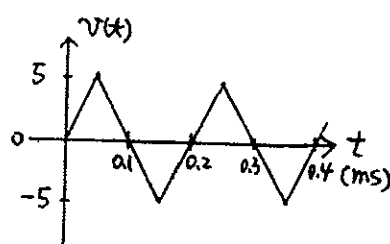


Figure 4

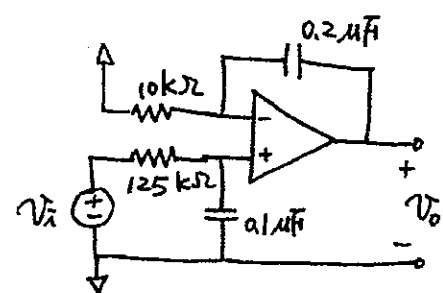


Figure 5

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