

國立臺灣科技大學 109 年度產業碩士專班招生(秋)試題

班 別：電力電子
科 目：電路學

(總分為 100 分)

不得使用計算器

1. What value of R in the circuit of Fig. P1 would cause the current source to deliver 800 mW to the resistors (15 %)

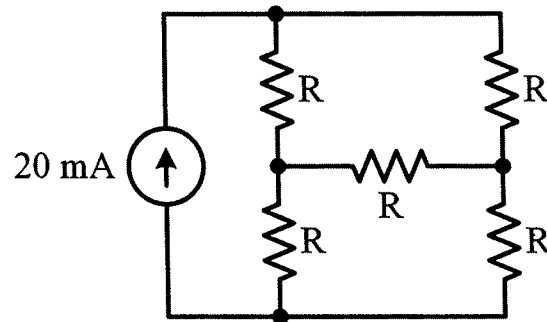


Fig. P1

2. Find the Thevenin equivalent circuit of the circuit shown in Fig. P2, to the left of the terminals $a-b$. Then find the current through $R_L=5, 15$ and 35Ω . (20 %)

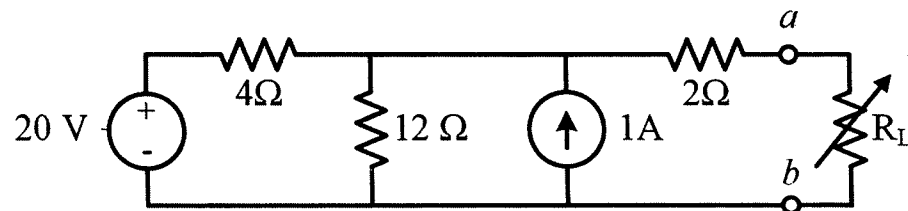


Fig. P2

3. Find the Norton equivalent circuit of the circuit in Fig. P3 at terminals $a-b$. (15 %)

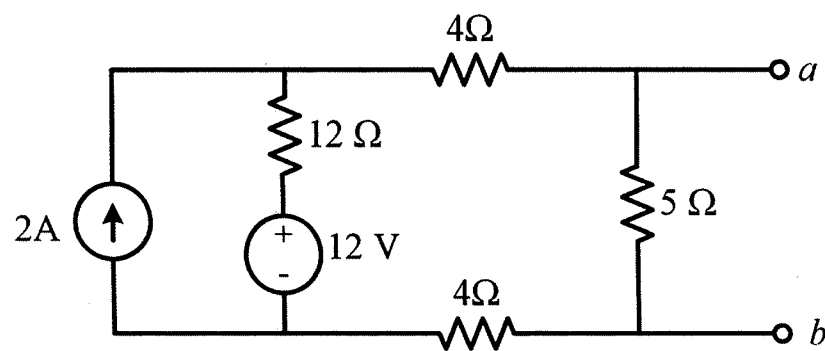
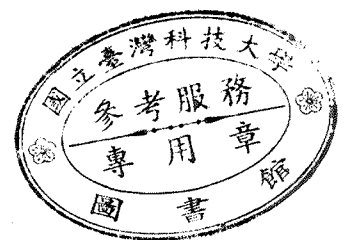


Fig. P3



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4. Let the circuit in Fig. P4 has a current source $i(t)$. If the resulting voltage $v(t)=V_m\cos(10^4t+\phi_v)$ V, then calculate (a) V_m , (b) ϕ_v , and (c) $i_c(t)$. (15%)

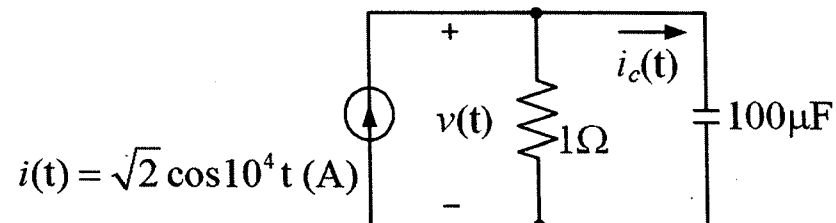


Fig. P4

5. Suppose the input current $i(t)=I_m\cos(10^4t+\phi_I)$ A as shown in Fig. P5. Please calculate (a) I_m , (b) ϕ_I , and (c) $v_o(t)$. (15%)

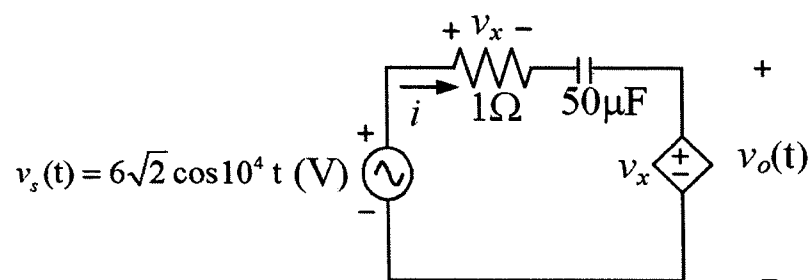


Fig. P5

6. Fig. P6 shows a series RLC circuit. If this circuit is driven at resonance by a voltage source $v_s(t)=10\cos\omega t$ mV, then calculate (a) resonant frequency $\omega_o = ?$ rad/s, (b) quality factor Q_S , (c) inductor voltage v_L , and (d) loop current i . (20%)

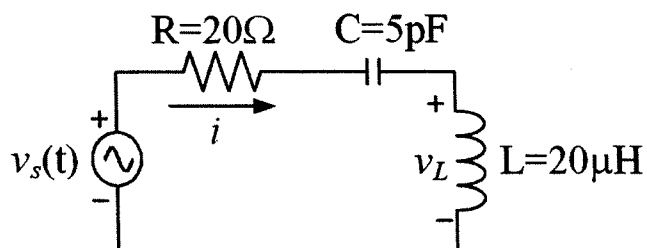


Fig. P6

