

國立臺灣科技大學 101 年度電力電子產業碩士專班招生(秋)試題
 系所組別：電力電子領域
 科目：電路學

(總分為 100 分)

不得使用計算器

1. For the circuit shown in Fig. P1, find i_o (15 分)

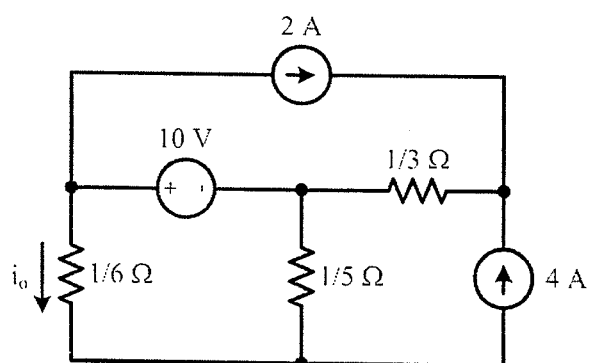


Fig. P1

2. For the circuit in Fig. P2, determine the value of R such that the maximum power delivered to the load R_L is 3 W. (20 分)

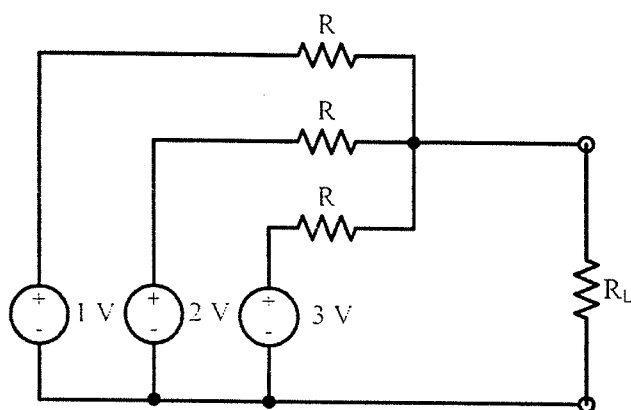


Fig. P2

3. An op amp circuit shown in Fig. P3a has the input waveform $v_i(t)$ shown in Fig. P3b. Plot the output waveform $v_o(t)$. Assume that the initial capacitor voltage was zero. (15 分)

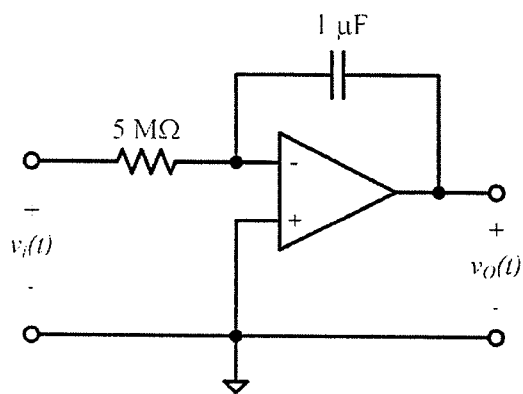


Fig. P3a

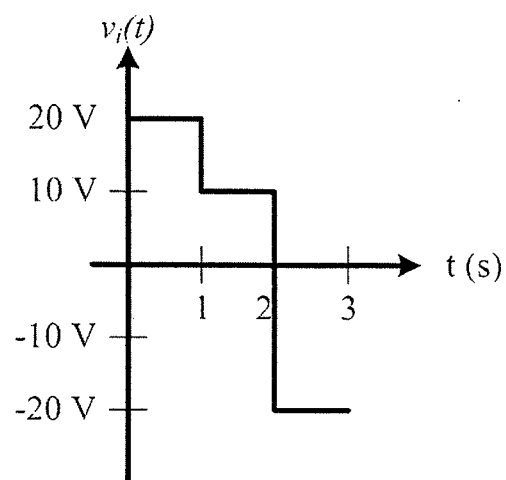
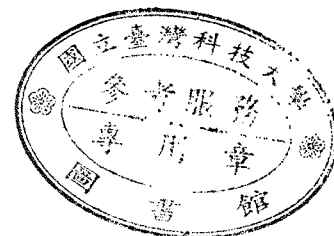


Fig. P3b



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4. Compute the voltage gain for the circuit in Fig. P4, assuming that $R_1 = 10 \text{ k}\Omega$, $R_2 = 1 \text{ k}\Omega$, $C_1 = 1 \text{ }\mu\text{F}$, $C_2 = 10 \text{ }\mu\text{F}$, and $\omega = 100 \text{ rad/sec}$. (20 分)

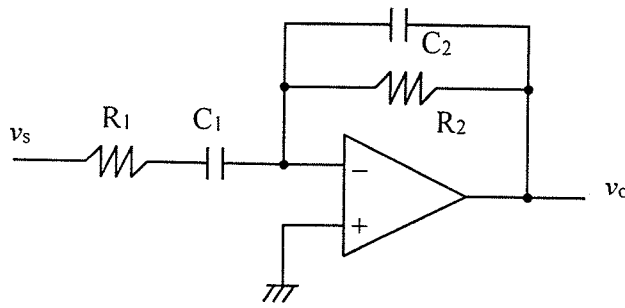
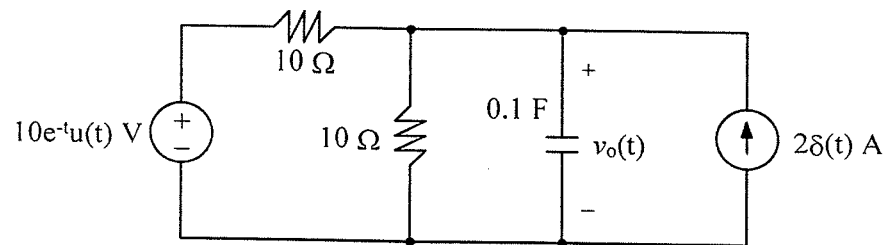


Fig. P4

5. Find $v_o(t)$ in the circuit of Fig. P5, where $u(t)$ is the unit step function and $\delta(t)$ is the delta function, assuming that $v_o(0) = 10 \text{ V}$. (20 分)



6. A load consumes 4 kW at a leading power factor of 0.8. Please determine the total load complex power. (10 分)

