

國立臺灣科技大學

115年度秋季班產業碩士專班招生

試題

系所組別：9920AI綠能科技

科 目：電路學

<<799201>>



國立臺灣科技大學 115 年度產業碩士專班招生(秋)試題

專班別：電力電子、AI 綠能科技

科目：電路學

(總分為 100 分；所有試題務必於答案卷內頁依序作答)

不得使用計算器

1. In the circuit shown in Fig. P1, the independent current source delivers a total power of 160 W to the resistor network on the right. Assuming the bridge is balanced, calculate the value of the resistor R . (15%)

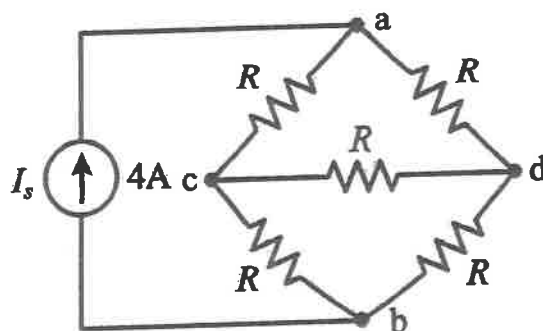


Fig. P1

2. Given the circuit in Fig. P2 containing two independent current sources and three parallel resistors, calculate the downward currents i_1 , i_2 , and i_3 flowing through the respective resistors. (15%)

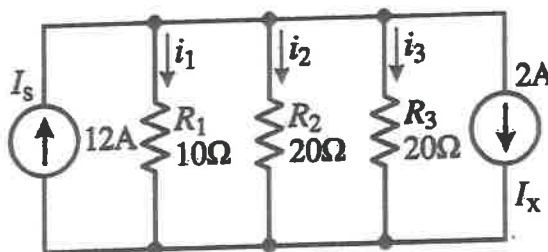


Fig. P2

3. For the circuit shown in Fig. P3 (20%):
- Determine the Thevenin equivalent circuit (Thevenin voltage V_{th} and Thevenin resistance R_{th}) to the left of terminals a-b. (10%)
 - If a variable load resistor R_L is connected between terminals a-b, find the current flowing through R_L when $R_L = 6 \Omega$ and $R_L = 22 \Omega$, respectively. (10%)

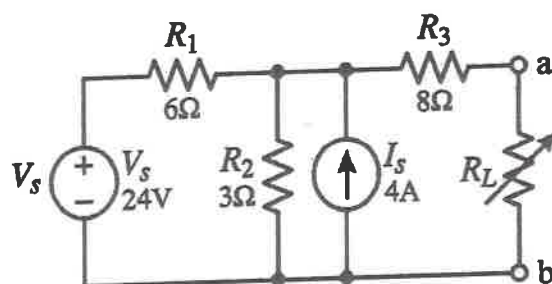


Fig. P3



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4. Assume the diode is ideal in Fig. P4, please find the average value of $v_o(t)$. (10%)

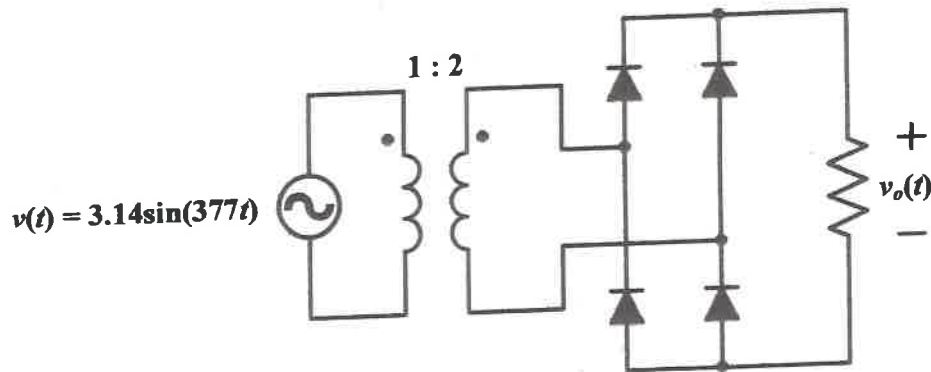


Fig. P4

5. Assume the parallel RLC circuit in Fig. P5 is at resonance. Please determine: (20%)

- (a) The resonant frequency f_r . (10%)
 (b) The total impedance Z_{total} . (10%)

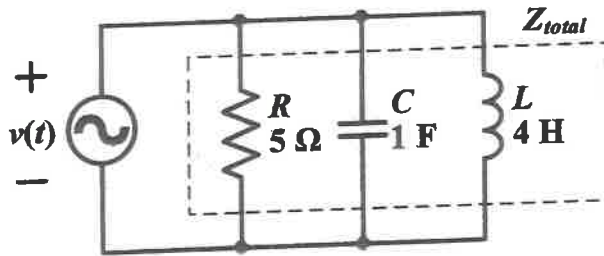


Fig. P5

6. Determine the output voltage V_o for the amplifier circuit shown in Fig. P6, given that $V_1=1V$, $V_2=3V$, $R=1k\Omega$, $R_f=10k\Omega$. (20%)

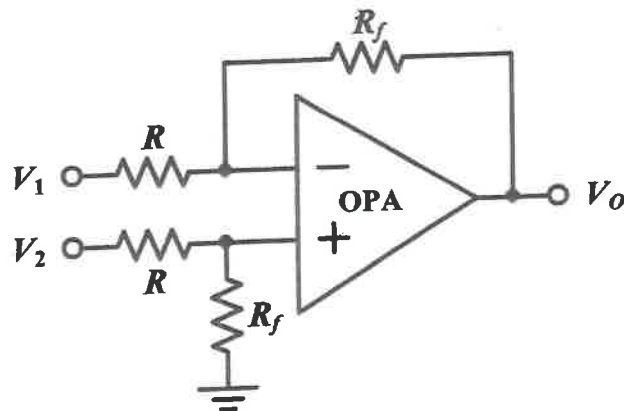


Fig. P6

