

國立臺灣科技大學 103 年度電力電子產業碩士專班招生(春)試題

系所組別：電力電子領域

科目：電路學

不得使用計算器

1. Find  $R_{eq}$  for the circuit shown in Fig. P1. (15 分)

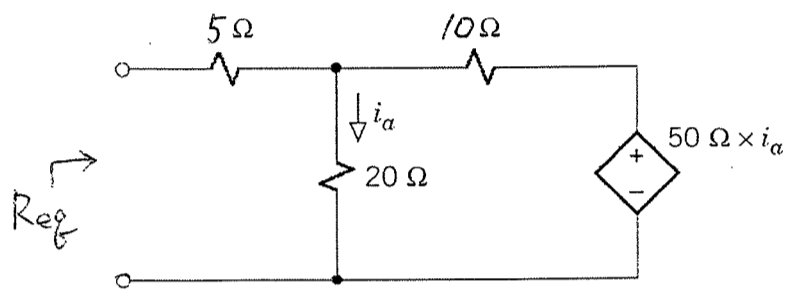


Fig. P1

2. (a) Please find the values of  $i_1$  and  $v_a$  in Fig. P2. (10 分)  
 (b) Find the power supplied by each source in Fig. P2. (10 分)

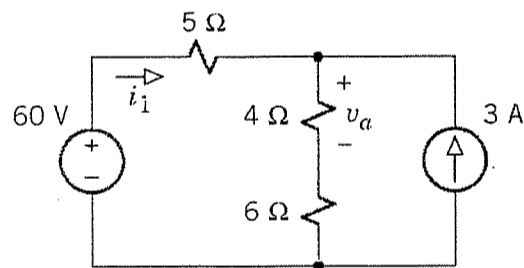


Fig. P2

3. Find the equivalent resistance  $R_{eq}$  of the resistive circuit in Fig. P3. (15 分)

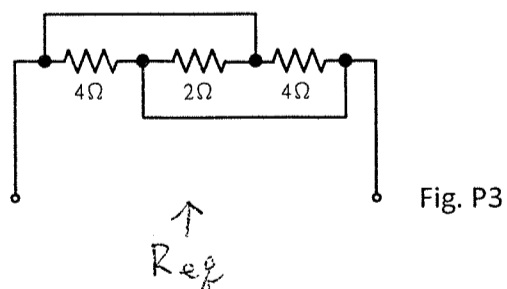
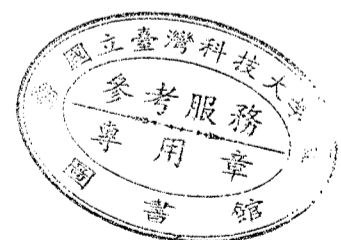


Fig. P3



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4. For the circuit shown in Fig. P4, find  $v(t)$  and  $i(t)$  (15 分)

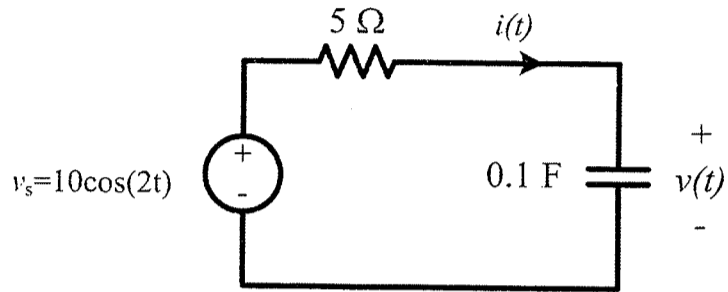


Fig. P4

5. In Fig. P5, if the voltage is  $v(t) = 1.2 \cos(\omega t) + 0.33 \cos(3\omega t) + 0.2 \cos(5\omega t)$  and the current is  $i(t) = 0.6 \cos(\omega t + 60^\circ) + 0.1 \cos(5\omega t + 45^\circ) + 0.1 \cos(7\omega t + 30^\circ)$ , calculate the average power transmitted to load (15 分)  
( $\cos(30^\circ) = 0.866$ ,  $\cos(45^\circ) = 0.707$ ,  $\cos(60^\circ) = 0.5$ )

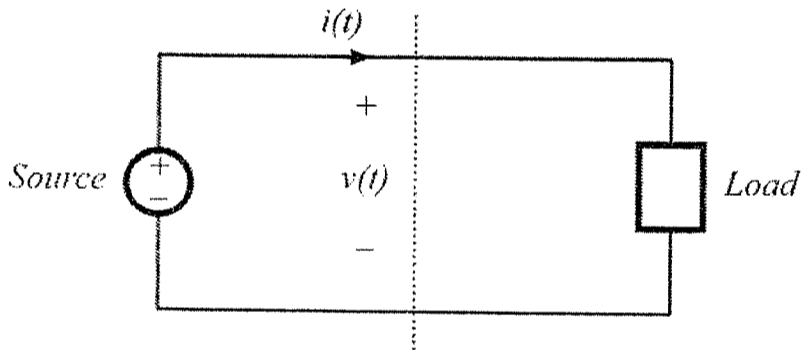


Fig. P5

6. For the compensation circuit shown in Fig. P6, find the transfer function  $\frac{V_o(s)}{V_i(s)}$  (20 分)

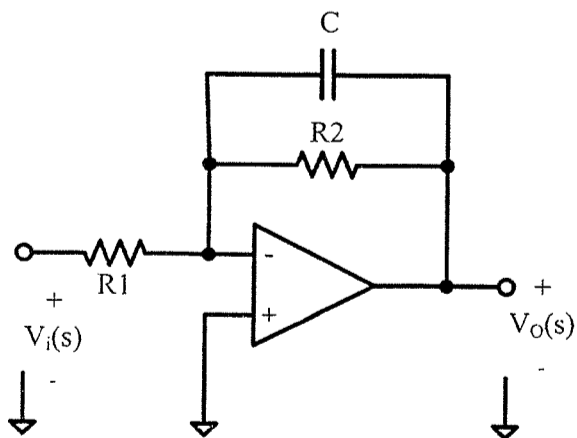


Fig. P6

