

國立台灣科技大學九十七年度電資產業研發碩士專班招生(秋)試題

系所組別：電力電子領域

科目：電路學

總分 100 分

1. Obtain the node voltages v_1 , v_2 and v_3 in the circuit of Fig. P1 (10 %)

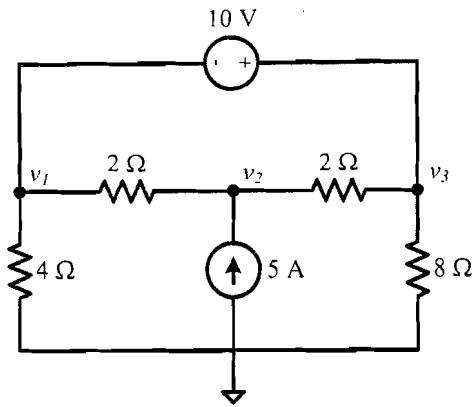


Fig. P1

2. Find the Thevenin equivalent looking into terminals a - b of the circuit in Fig. P2 (10 %)

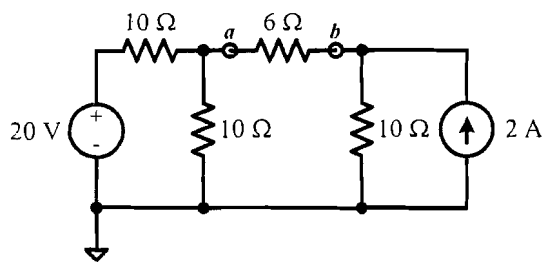
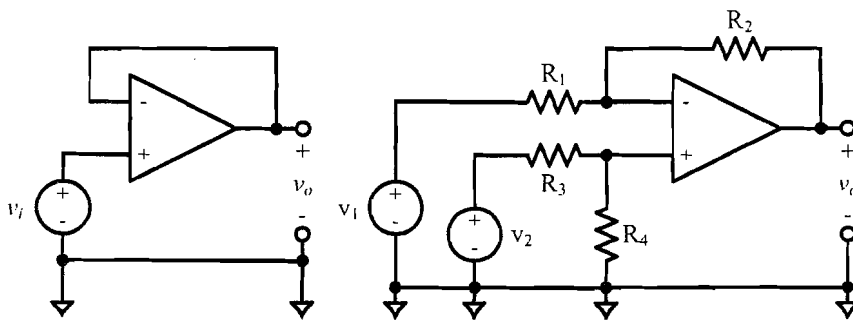


Fig. P2

3. Simply explain the operating principles and the applications of the following OP AMP circuits shown in Fig. P3(a) and Fig. P3(b) (Assuming the OP AMP is ideal) (15 %)



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4. Find the complete response v and i for $t > 0$ in the circuit of Fig. P4 (15 %)

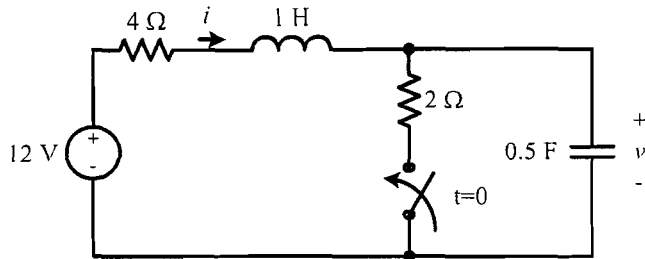


Fig. P4

5. The circuit in Fig. P5 is operating at 10^5 rad/sec. Determine L and the turns ratio n to achieve maximum power transfer to the load. (15 %)

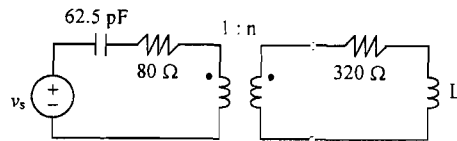


Fig. P5

6. Determine $i(t)$ in the steady state for the circuit shown in Fig. P6, where $v_1(t) = 2 \cos(2000t + 45^\circ)$ V, and $v_2(t) = 6 \cos(1000t - 30^\circ)$ V. (20 %)

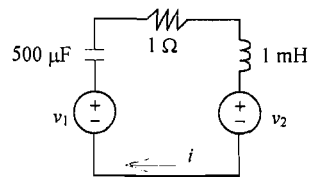


Fig. P6

7. Two coupled coils are connected as shown in Fig. P7. Find the equivalent inductance L_{ab} . (15 %)

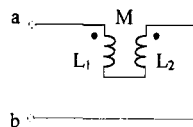


Fig. P7