國立中山大學九十三學年度碩士班招生考試試題

科目：基礎電路學（電機系碩士在職專班）

1. With the help of nodal analysis on the circuit of Fig.1, find (a) v_A ; (b) the power dissipated in the 2.5-Ω resistor. (15%)
2. If it is assumed that all the sources in the circuit of Fig.2 have been connected and operating for a very long time, use the superposition principle to find $v_C(t)$ and $v_L(t)$. (15%)
3. (a) Find $v_C(t)$ for $t > 0$ in the circuit shown in Fig.3. (b) Sketch $v_C(t)$ versus t, $-0.1 < t < 2$ ms. (15%)
4. For the network of Fig.4, find Z_{in} at $\omega = 4$ rad/s if terminals a and b are (a) open-circuited; (b) short-circuited. (10%)
5. Use phasors and nodal analysis on the circuit of Fig.5 to find V_2. (15%)
6. Find the Thevenin-equivalent circuit for Fig.6. (15%)
7. (a) Write a set of mesh equations in terms of $I_1(s)$, $I_2(s)$, and $I_3(s)$ for the circuit shown in Fig.7. (b) Find I_3 if $s = -1$ Np/s. (15%)

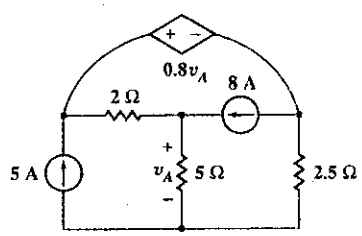

Figure 1.

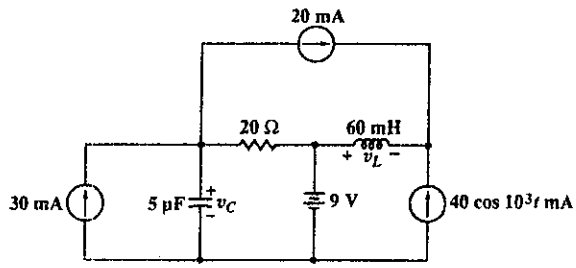

Figure 2.

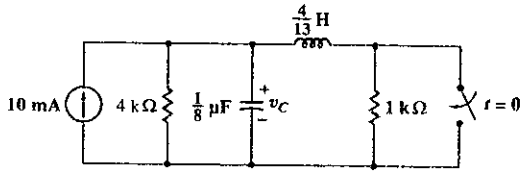

Figure 3.

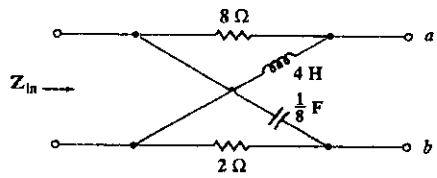

Figure 4.

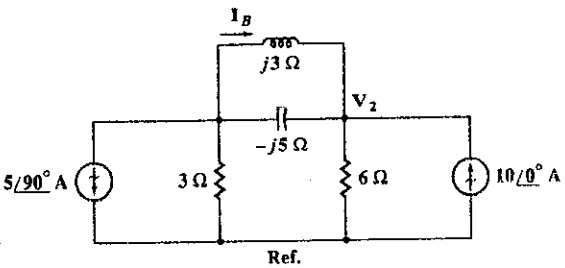

Figure 5.

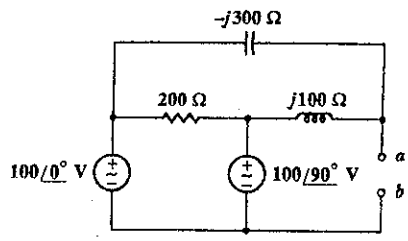

Figure 6.

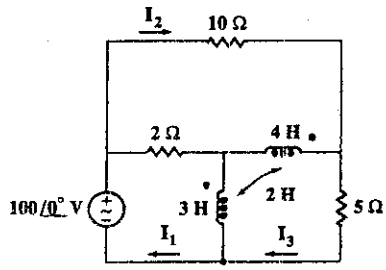

Figure 7.