國立高雄應用科技大學

106 學年度研究所碩士班招生考試

電機工程系碩士班

電路學(甲組)

注意：a. 本試題共五題，每題 20 分，共 100 分
b. 作答時不必抄題
c. 考生作答前請詳閱答案卷之考生注意事項

1. The current i_a in the circuit shown in Fig. 1 is 2A, find (a) the value of voltage source v_s (b) the power delivered by the controlled current source.

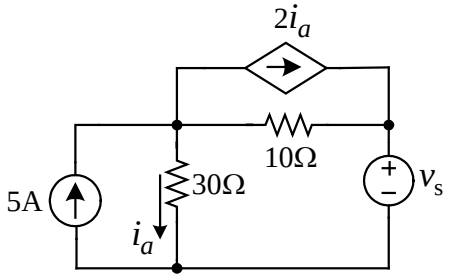

Fig. 1

2. The circuit in Fig.2 has initial inductor current $i_L(0)$= -45mA, and initial capacitor voltage $v(0)$=15V. Find $v(t)$ for $t \geq 0$.

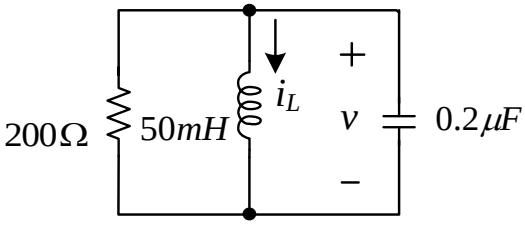

Fig.2

3. For the circuit in Fig.3, if i_g is the input signal and v_o is the output signal.
   (a) Find the numerical expression of the transfer function in s-domain.
   (b) Give the numerical value of each pole and zero of the transfer function.

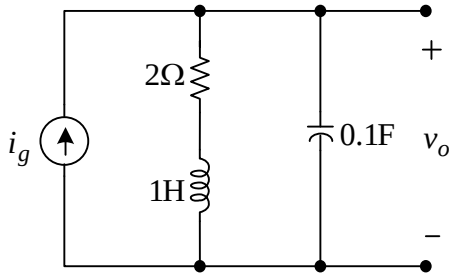

Fig. 3

4. The voltage source in the phasor-domain circuit shown in Fig.4 is $\mathbf{V_g} = 240\angle 0^o$ V(rms). Find the average power and reactive power delivered from the voltage source.

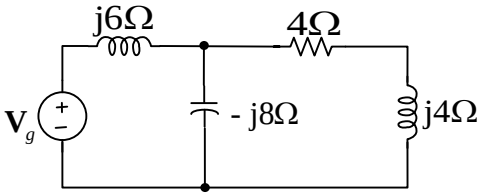

Fig. 4

5. Find I_1 and I_2 if the transmission parameters for the two-port circuit in Fig. 5 are

$$\begin{bmatrix} 5 & 10\Omega \\ 0.4S & 1 \end{bmatrix}$$

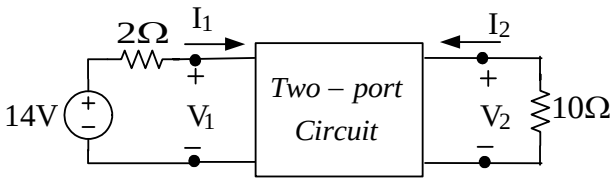

Fig. 5