國立中正大學106學年度碩士班招生考試試題

系所別：電機工程學系-信號與媒體通訊組
電力與電能處理甲組

科目：電路學

第1節

1. Use **source transformation** to simplify the circuit in Fig. 1 as far as possible and find I_o. (write each step) (16%)

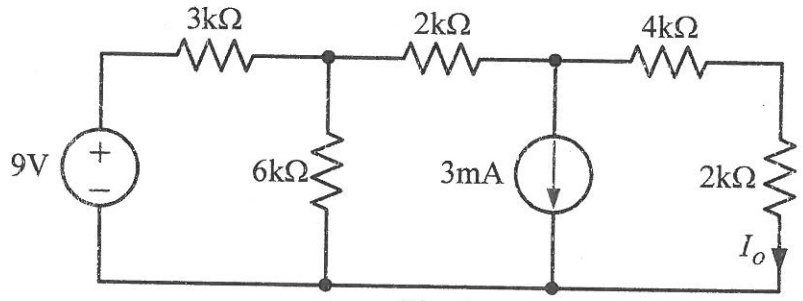

Fig. 1

2. Use **Thevenin's theorem** to find the voltage $v_o(t)$ in Fig. 2. (16%)

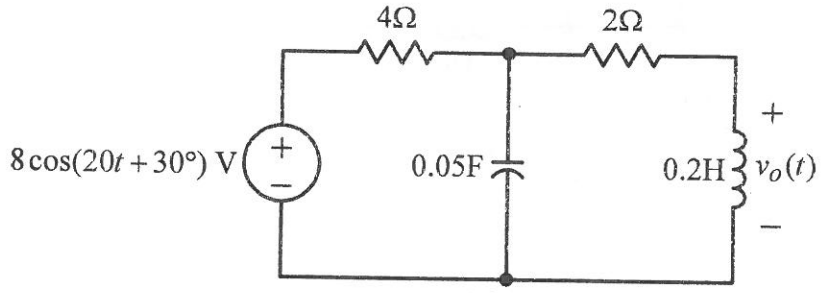

Fig. 2

3. (a) Determine the power factor of the load and the complex power absorbed by the load shown in Fig. 3. (b) Determine the value of C to raise the power factor to 0.9 lagging (f= 60Hz). (18%)

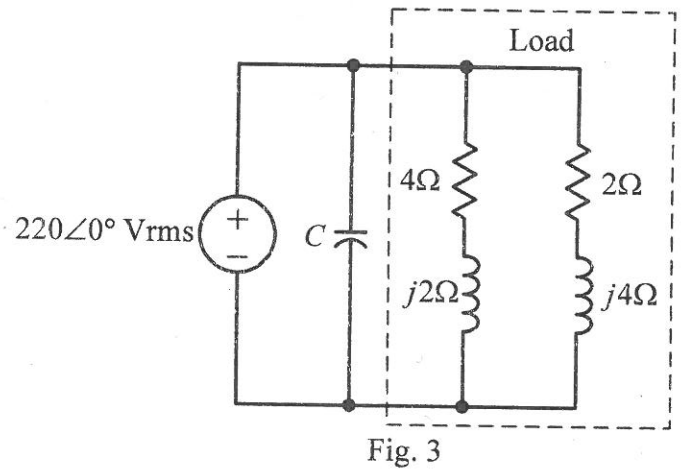

Fig. 3

4. Find $\mathbf{V}_o$ in the network drawn in Fig. 4. (16%)

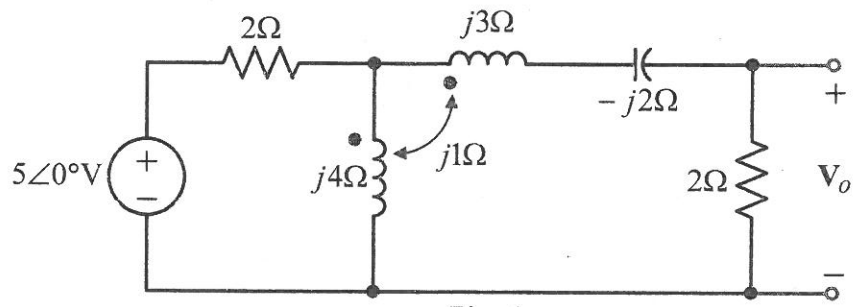

Fig. 4

5. Find and use the transfer function $\mathbf{H}(s) = \mathbf{V}_o(s)/\mathbf{V}_i(s)$ of the circuit shown in Fig. 5 to determine the steady-state response $v_{oss}(t)$ (assume zero initial conditions). (16%)

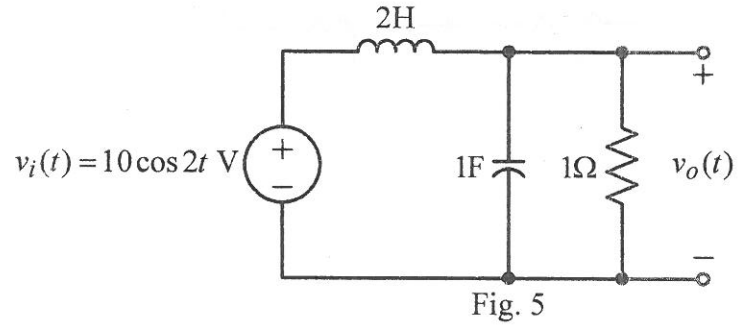

Fig. 5

6. (a) Find the total transmission parameters of the network in Fig. 6 if $\mathbf{A} = 2$, $\mathbf{B} = 1\Omega$, $\mathbf{C} = 1\text{S}$, $\mathbf{D} = 2$; (b) Determine the output voltage $\mathbf{V}_o$ of the network. (18%)

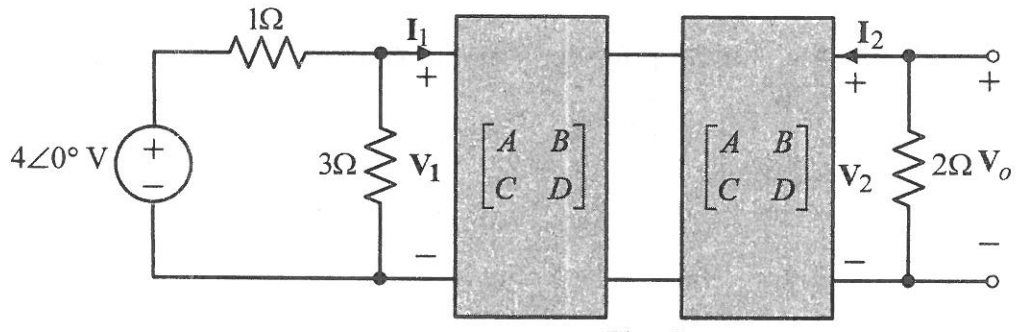

Fig. 6