

1. Please find the power supplied by the dependent voltage source V_I shown in Fig. 1. [10]
2. For the circuit shown in Fig. 2(a) with input voltage $v_{in}(t)$ shown in Fig. 2(b), please determine the output voltage (i) $v_o(2) = ?$ at $t = 2$, (ii) $v_o(4) = ?$ at $t = 4$. [10]
3. By adding a capacitor, Fig. 2(a) becomes Fig. 3. If a sinusoidal input voltage $v_{in}(t)$, with the amplitude of 2V and the frequency of 100 kHz, is applied to the circuit, please determine the amplitude of the output voltage. [10]
4. An ideal transformer with turns ratio of 1:2 is used to deliver power to the load as shown in Fig. 4. Please determine the value of the output load current, I_o , in phasor form. [10]
5. In Fig. 5, the switch SW moves from position A to position B at $t = 0$. Compute inductor current $i_L(t)$ for $t > 0$. [20]
6. For the circuit shown in Fig. 6, please find the Thevenin's equivalent circuit at terminal A-B. [20]
7. A motor consumes 60 kW with power factor 0.89 lagging. The load voltage is $220/\angle 0^\circ$ Vrms. If the transmission line impedance is $(0.2 + j0.2) \Omega$, determine (i) the reactive power supplied by the source voltage at the input end and (ii) the power factor at the input end. [20]

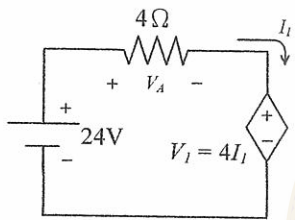


Fig. 1

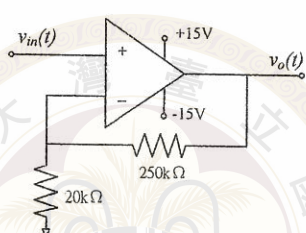


Fig. 2(a)

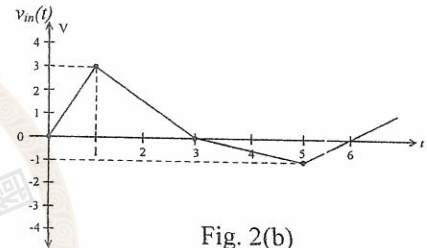


Fig. 2(b)

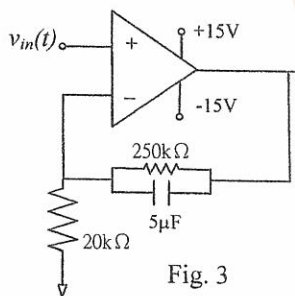


Fig. 3

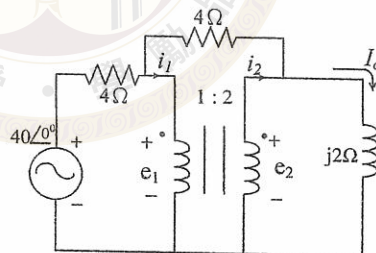


Fig. 4

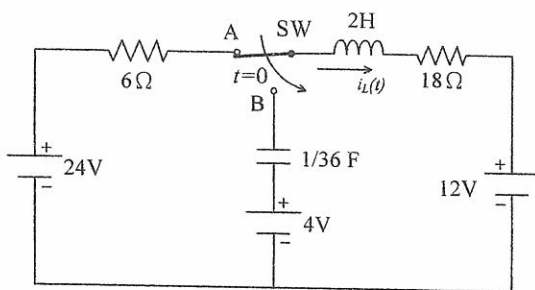


Fig. 5

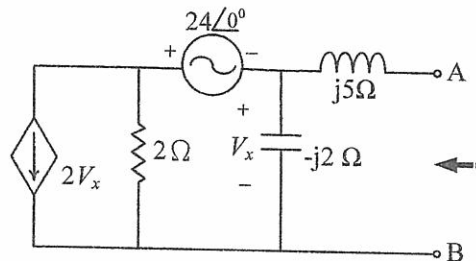


Fig. 6