

14.1 Find the input impedance $Z(s)$ of the network in Fig. P14.1. **CS**

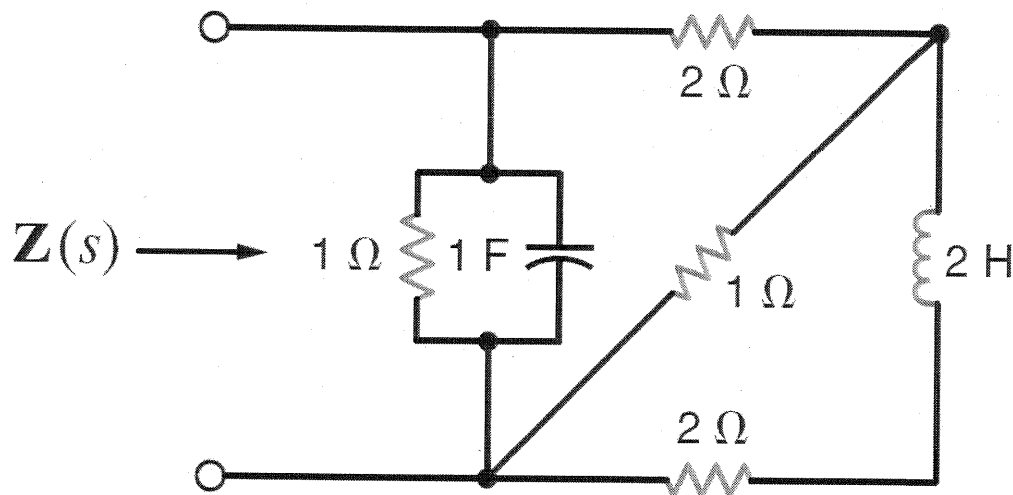
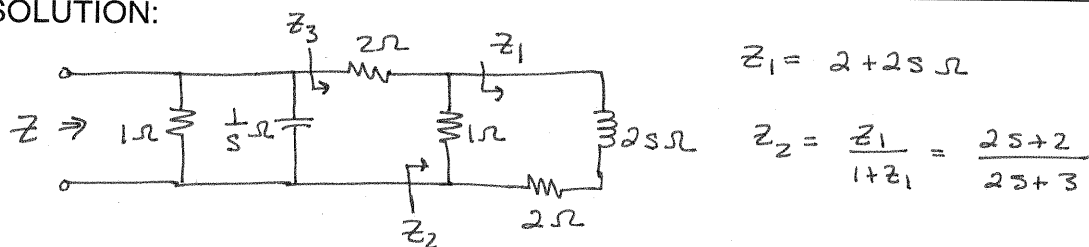


Figure P14.1

SOLUTION:



$$z_1 = 2 + 2s \Omega$$

$$z_2 = \frac{z_1}{1 + z_1} = \frac{2s + 2}{2s + 3}$$

$$z_3 = Z + z_2 = 2 + \frac{2s + 2}{2s + 3} = \frac{4s + 6 + 2s + 2}{2s + 3} = \frac{6s + 8}{2s + 3}$$

$$Z = \frac{1}{\frac{1}{1} + s + \frac{1}{z_3}} \quad 1 + s + \frac{1}{z_3} = s + 1 + \frac{2s + 3}{6s + 8} = \frac{6s^2 + 16s + 11}{6s + 8}$$

$$Z = \frac{6s + 8}{6s^2 + 16s + 11}$$