ECE215 HW4

November 14, 2025

Due Date: 28th November

Hint: In this homework, final answers should be expressed as $Ans = A\angle\phi$.

Problem 1

Set $i_s = 2\cos 10^3 t$ A in Fig. 1. Try to find:
(1) Use Y-Δ transformation to find the equivalent Z of this circuit.
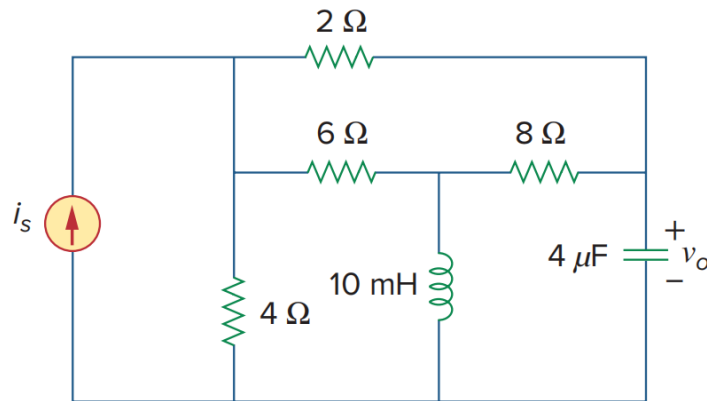(2) Find v_0.

Figure 1: Circuit of Problem 1.

Problem 2

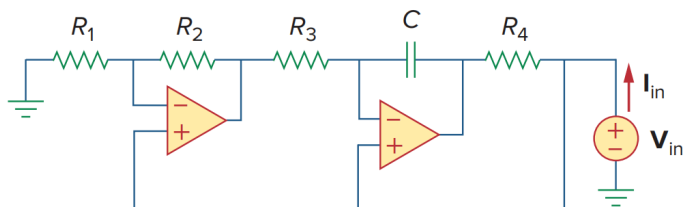Let $V_{in} = V_m \cos \omega t$, try to find Z_{in} in Fig. 2. $Z_{in} = \frac{V_{in}}{I_{in}}$.

Figure 2: Circuit of Problem 2.

Problem 3

Find I_o in the circuit of Fig. 3.

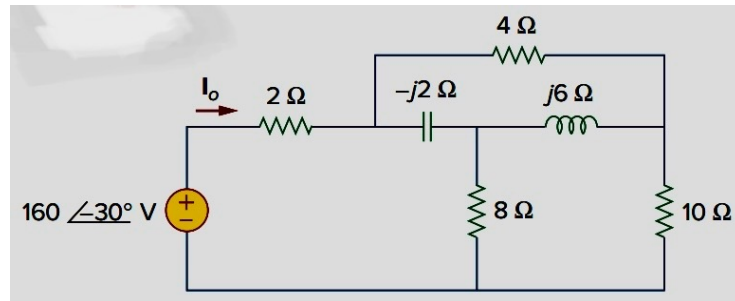

Figure 3: Circuit of Problem 3.

Problem 4

The AC bridge circuit of Fig. 4 is called a Wien bridge. It is used for measuring the frequency of a source. Try to find the frequency of the source when the bridge is balanced.

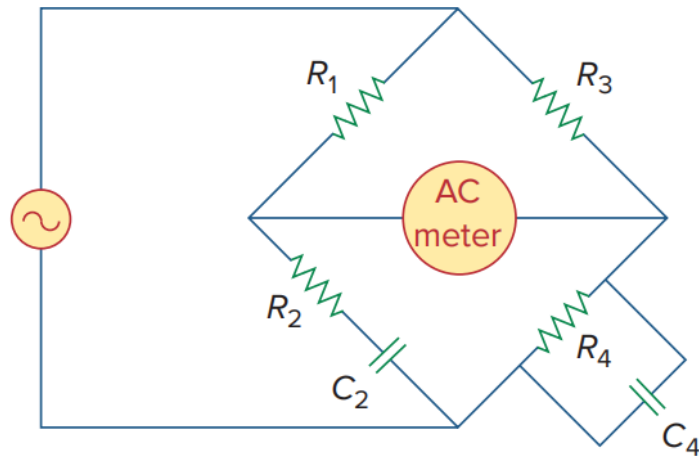Hint: The bridge is balanced means the value shown on AC meter is zero. R1 and R3 could be any purely resistive resistances.

Figure 4: Circuit of Problem 4.