

EMS 2019 HOMEWORK 2

1. Calculate the deflection (α_p) of the galvanometer from the Wheatstone bridge shown in the Figure 1. The galvanometer has a current sensitivity of $S_I=10\text{mm}/\mu\text{A}$.

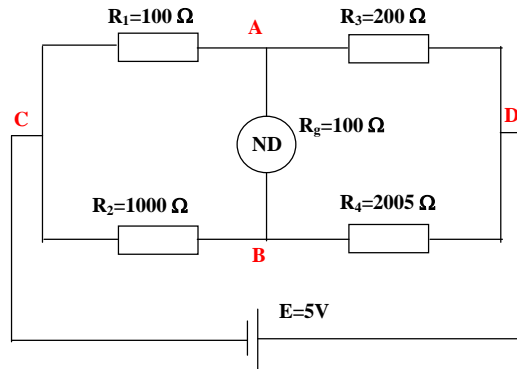


Figure 1

2. Demonstrate that the ac bridge from Figure 2 can be used to find the components of a given coil, L_x and R_x as follows:

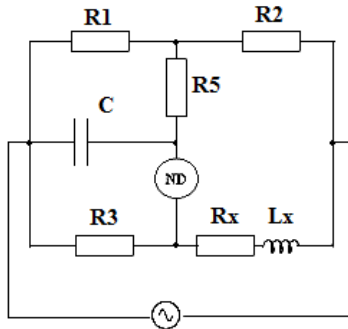


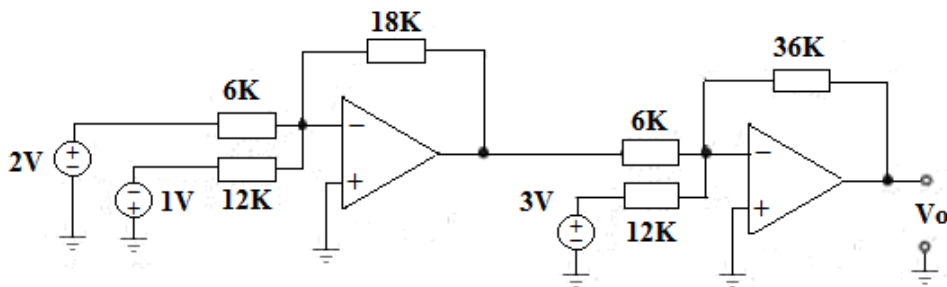
Figure 2

$$R_x = \frac{R_2}{R_1} R_3$$

$$L_x = C[R_2(R_1 + R_5) + R_1 R_5] \frac{R_3}{R_1}$$

Hint: Use the Δ -Y transformation!

3. Determine the output voltage of the circuit from Figure 3. Assume the ideal op-amps.



4. Considering the next signal:

- Calculate the reading that would be observed on a multimeter when the instrument is put on V-DC.
- Calculate the voltage reading that would be observed on a multimeter when the instrument is put on V-AC (true rms).
- Calculate the form factor K_f

