

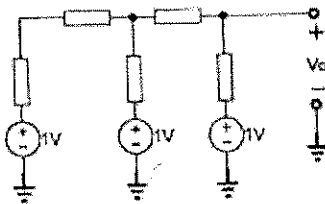
## Midterm Examination

ECE 580

October 20, 2021

Open book

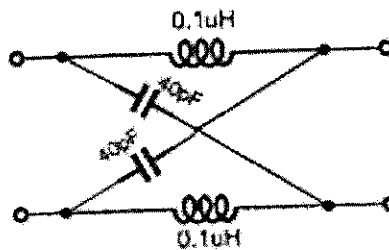
1. Find the branch currents and the output voltage in this ladder. All impedances are  $1\text{ k}\Omega$ . Hint: think carefully before starting to calculate!



2. The two-port shown operates between two  $50\ \Omega$  resistors, at  $\omega = 500\text{ Mrad/s}$ .

(a) Find its scattering matrix.

(b) What are the properties of the circuit? What role does it play?



- 3.(a) Find the current gain  $A_I(j\omega)$  of the circuit shown.

(b) Find the radian frequency  $\omega_1$  where  $|A_I(j\omega_1)| = 1$ .

