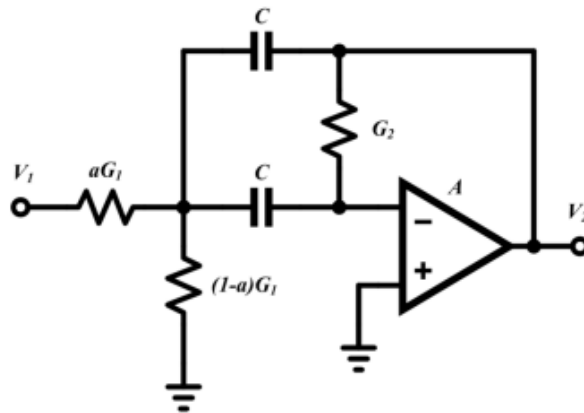**FINAL EXAMINATION**

ECE 580

December 7, 2021

1. Design a Delyiannis-Friend filter for a peak frequency of f_o = 12.5 kHz, a midband voltage gain of 20, and a pole Q =10. Set C = 5 pF.

2. (a) Find the admittance matrix **Y** of the two-port shown below.

   (b) Find its scattering matrix when it operates between two 1 kΩ resistors. What are the power transmission properties of the terminated two-port?

   (c) Find the sensitivities of the output voltage V_o to variations of R and r if instead of the 1 kΩ terminations the two-port is driven by a 1 V voltage source, and its output is open circuited.