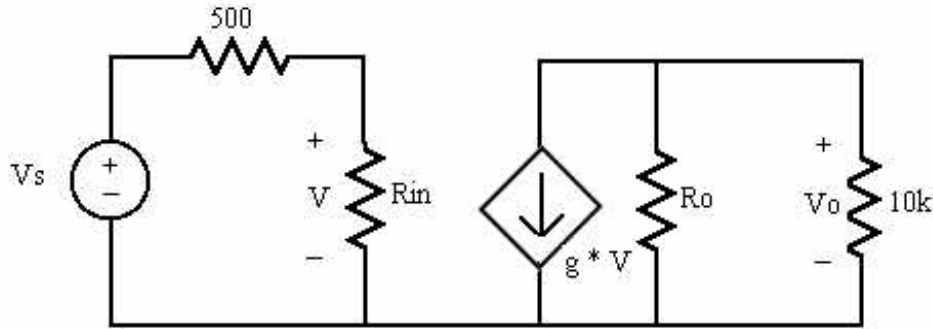


ECE 210 - Design Project #1

Introduction

The network shown below is an equivalent circuit for a transistor amplifier used in a stereo preamplifier. The input circuitry consists of a (small) voltage source in series with a 500Ω resistor to model the output of a compact disk player. The dependent source, R_{in} , and R_o model the transistor, which amplifies the signal and sends it to the power amplifier. The $10k$ load resistor models the input to the power amplifier that actually drives the speakers.



Problem Statement

You are to design the transistor portion of the circuit by choosing the values of g , R_{in} , and R_o . These values are to be chosen under the following constraints:

- (1) The 'gain' of the circuit $\frac{V_o}{V_s} \approx -200$
- (2) R_{in} , and R_o must be chosen so that they are readily available in our lab (i.e. $10 \leq R \leq 1M$).
- (3) The maximum output of the dependent current source is 25ma . Note: The input, V_s , will be less than 0.5 volts at all times.

Report

This assignment will count as a portion of your "design projects" grade, and hence the report must be well written and complete. Typing the reports is desirable, but no penalty will be given for handwritten submissions, provided they are *extremely* neat and readable. It is expected that the written part of this report will fit on 2 typed pages (not including the circuit schematics and equations needed to perform and verify the design).

Provide the following sections in your report:

- ♣ **Problem Statement** – What are you trying to solve?
- ♣ **Design Objectives** – What should the design accomplish?
- ♣ **Design** – *Show All the steps of your design.* This is the most important part of the assignment, and will count as at least 50% of your grade. *Clearly* show attempts at solutions and explain your work (in words if necessary), even if your attempts are unsuccessful.
- ♣ **Conclusion** – What did you learn?