

Name: \_\_\_\_\_ (please print)

Signature: \_\_\_\_\_

ECE 3355  
Quiz 5 (on-line)  
April 29, 2021

Quiz duration: 30 minutes

1. This quiz is open book, open notes. You may not, however, consult another person, verbally or online, for help. You may not submit your quiz to any site online in an effort to get help on the quiz.
2. Show all work necessary to complete the problem on these pages. A solution without the work shown will receive no credit.
3. Show units in intermediate and final results, and in figures.
4. If your work is sloppy or difficult to follow, points will be subtracted.

Instructions for an on-line quiz

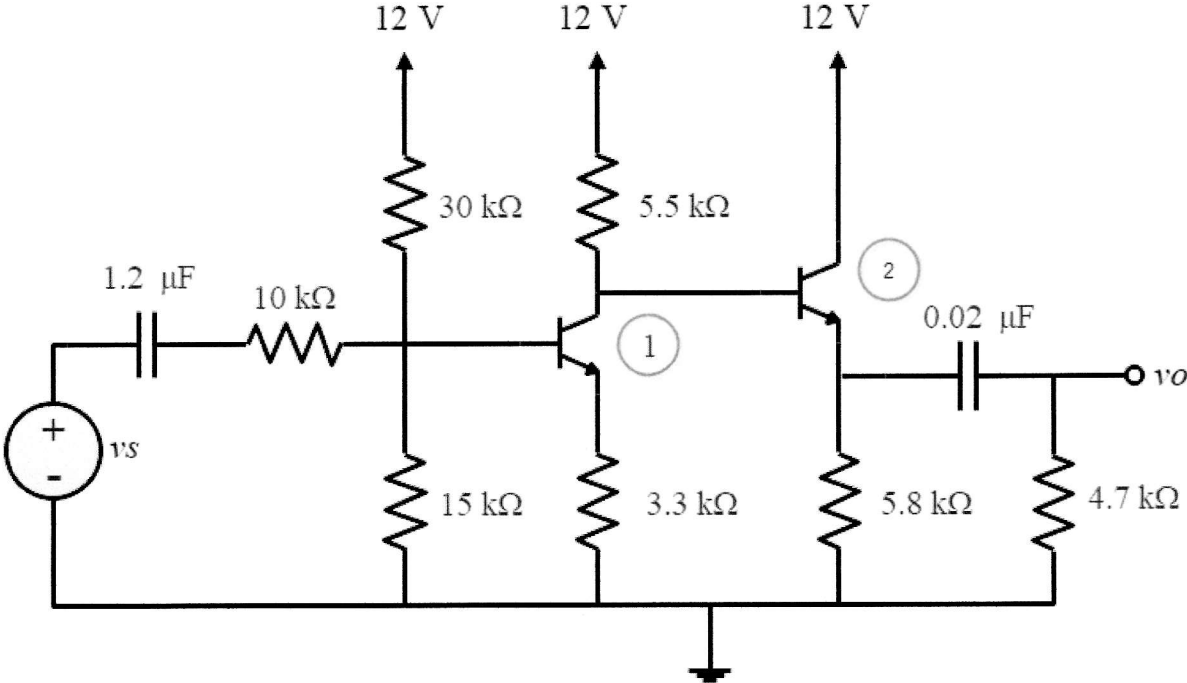
- You will have 30 minutes to take the quiz, and 10 minutes to scan and upload it. Blackboard will stop accepting your work at 11:20 am.
- Please turn on your video.
- When you upload your work, make it a single .pdf document, and be sure it is legible and complete before uploading!
- I will be available for questions. If you need to ask a question, please use the “raise your hand” option on Zoom.

\_\_\_\_\_ /25

Room for Extra Work

The BJTs in the circuit below are operating in the linear (active) region. You do not need to prove this. Both transistors have  $\beta = 100$ , and  $V_{CE,sat} = 0.3 \text{ V}$ . Values for  $r_{\pi}$  for BJT 1 and 2 are  $r_{\pi 1} = 4500 \Omega$ , and  $r_{\pi 2} = 1800 \Omega$ .

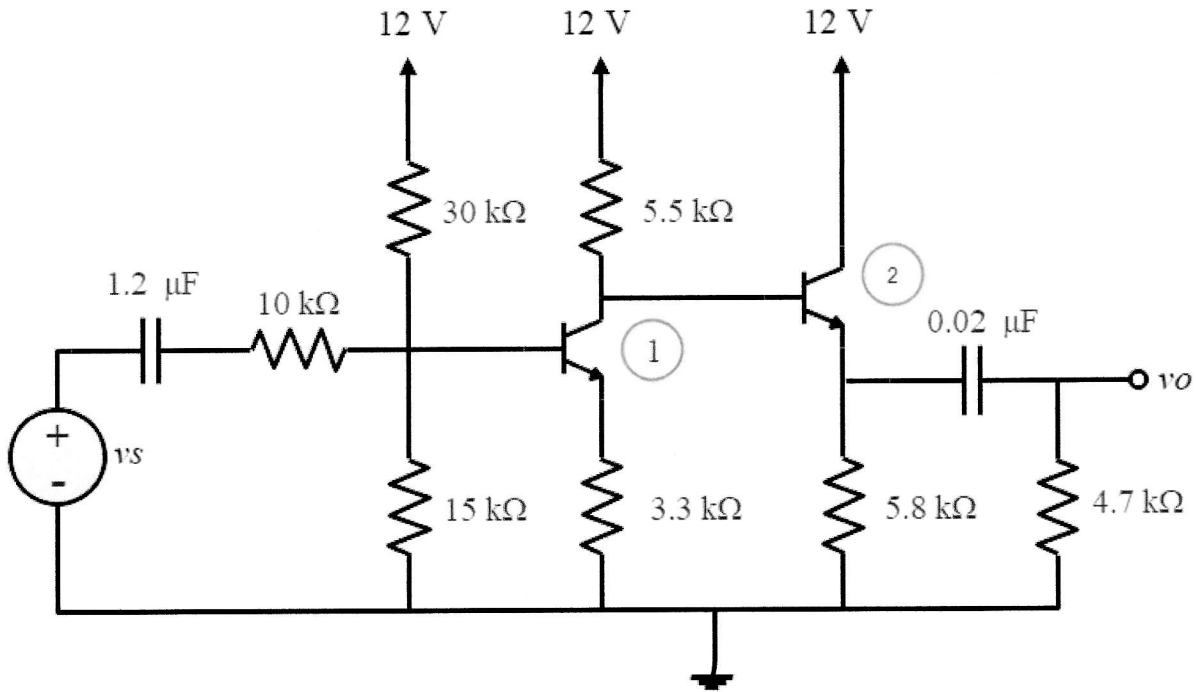
Draw a small-signal (ac) circuit model for this circuit that would be valid in the passband. No calculations are necessary, although you may simplify the circuit if you wish. Be sure to label the source  $v_s$  and the output  $v_o$ .



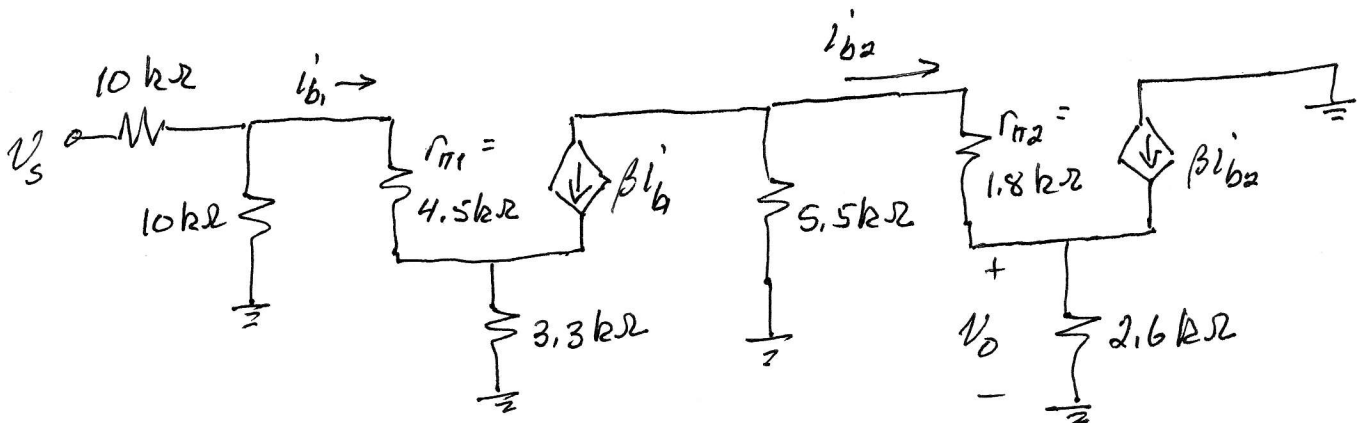
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In the passband, the capacitors are shorts.



We have combined in parallel the base resistors  $30 \text{ k}\Omega$  and  $15 \text{ k}\Omega$ , and the resistors 3 at the output  $5.8 \text{ k}\Omega$  and  $4.7 \text{ k}\Omega$