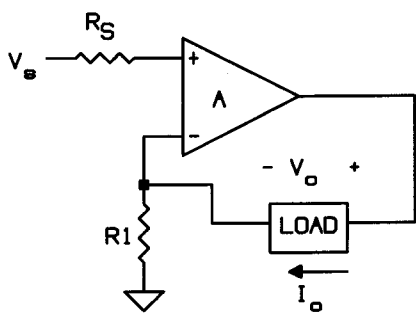


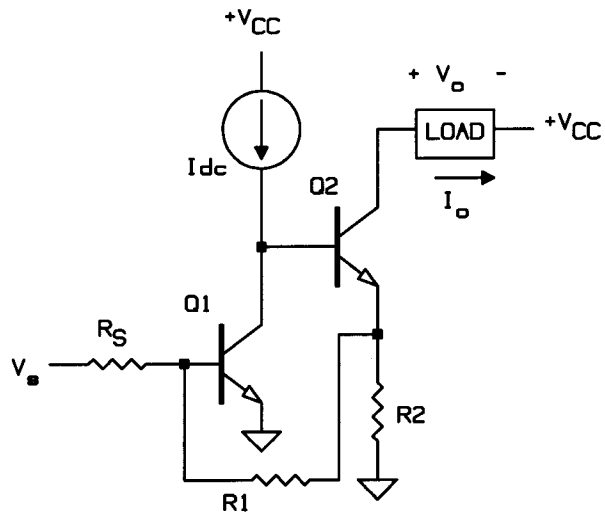
**Test II**  
**Electronics II**  
 March 11, 1996  
 Closed Book/One Page of Notes

1. The following circuits all employ negative feedback. In each case the source is identified as " $v_s$ ". For each circuit determine the following: [12 points total, 3 points each circuit]

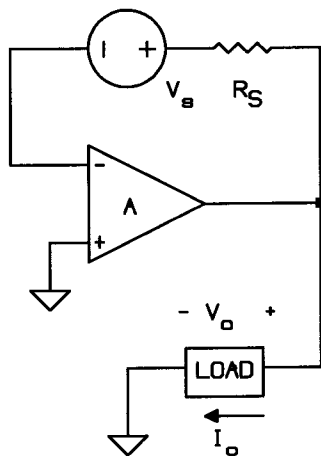
- (a) The type of feedback being used (e.g., shunt-series, etc.). [1 pt]
- (b) The transfer function which is actually stabilized by the feedback (e.g.,  $\frac{V_o}{I_s}$ ). [1 pt]
- (c) The approximate value of this transfer function. [1 pt]



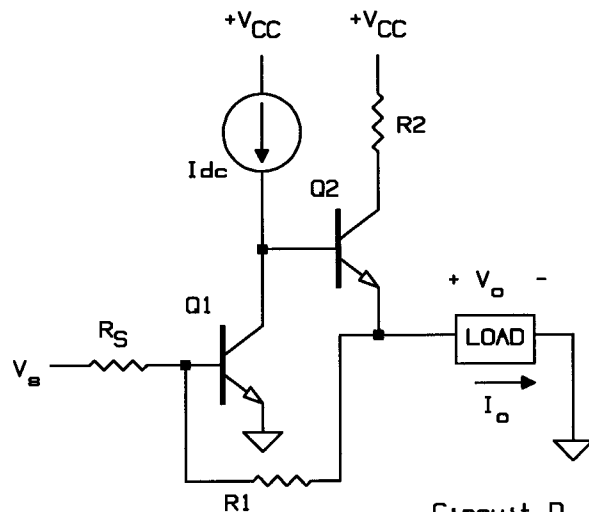
Circuit A



Circuit B



Circuit C

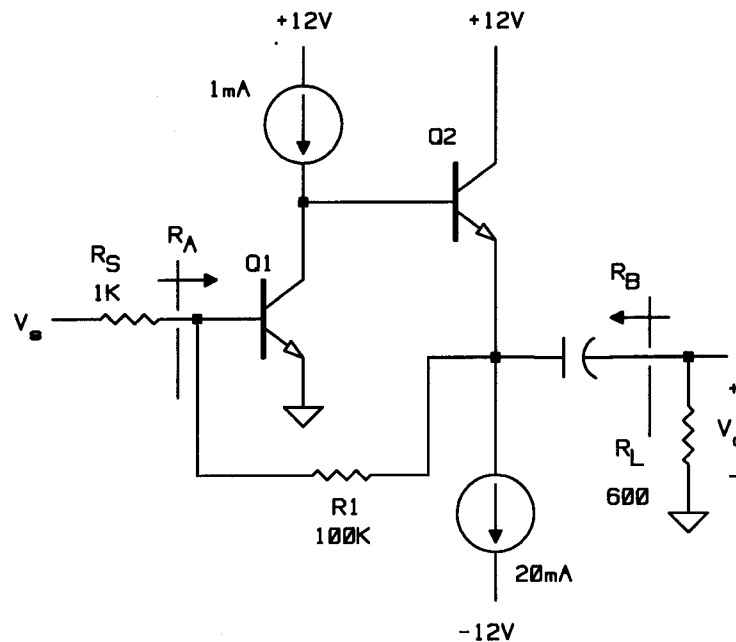


Circuit D

Electronics II Test II

2. This amplifier uses shunt-shunt feedback. The dc analysis may be done using the approximation that the dc base currents are negligible. All parts of this problem are done at midband except for (e). [8 points total]

- (a) Draw a fully-labeled equivalent circuit which separates the feedback from the loading. Clearly mark the A network, and the  $\beta$  network. [3 pts]
- (b) Calculate the amount of feedback being used. [2 pts]
- (c) Find  $\frac{v_O}{v_S}$  (exactly). [2 pts]
- (d) Find  $R_A$  and  $R_B$ . [1 pt]
- (e) Estimate the dominant high-frequency corner for the system. (Hint: without feedback, the amplifier frequency response is dominated by the Miller pole associated with Q1.) EXTRA CREDIT!



Q1 & Q2 Data

$\beta = 200$   
 $V_A = 100 \text{ V}$   
 $C_\pi = 10 \text{ pF}$   
 $C_\mu = 4 \text{ pF}$

20 points total