Faculty of engineering at shoubra Communication department ECE-322: Electronic Circuits (B)

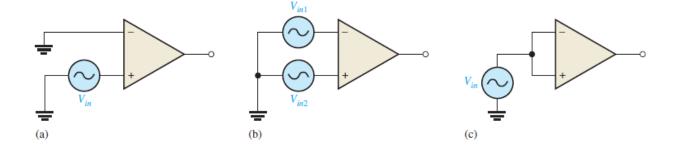


Dr. Ahmad El-Banna Semester : Spring 2017

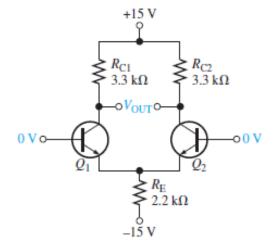
Sheet:1

Differential Amplifiers

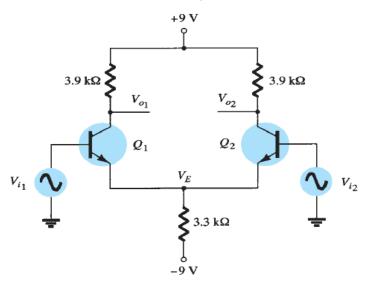
1. Identify the type of input mode for each op-amp in Figure



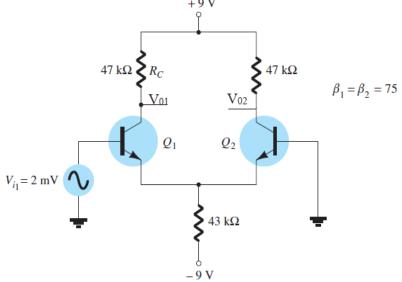
2. The dc base voltages in Figure are zero. Using your knowledge of transistor analysis, determine the dc differential output voltage. Assume that Q_1 has an $\alpha = 0.980$ and Q_2 has an $\alpha = 0.975$.



3. Calculate the dc voltages and currents in the circuit of Fig.

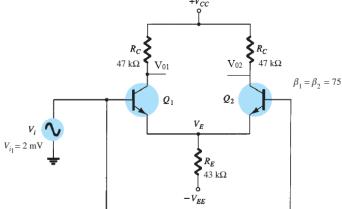


4. Calculate the single-ended output voltage V_{01} , V_{02} for the circuit of Fig, and then sketch them.



5. Drive and then calculate the common-mode gain for the amplifier circuit of Fig. and the output

voltage V_{01} , V_{02}



6. Calculate the common-mode gain and I_{C1} , I_{C2} for the differential

amplifier of Fig.

