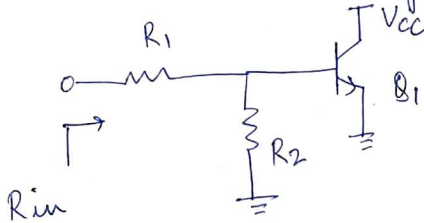
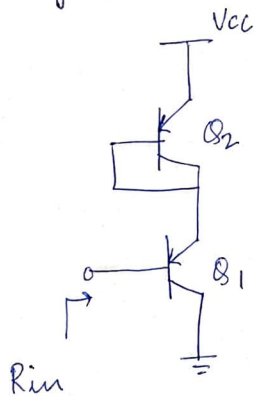


Ref: ECE 322 class notes, Fundamentals of Microelectronics by Razavi

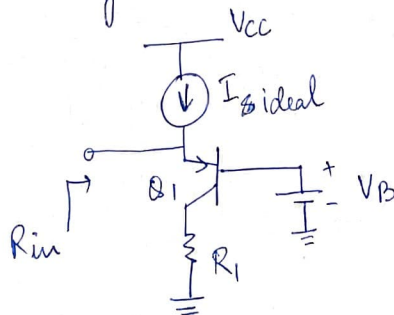
Q1) Calculate the input resistance of the following circuit. Use the small signal model to derive  $R_{in}$ .



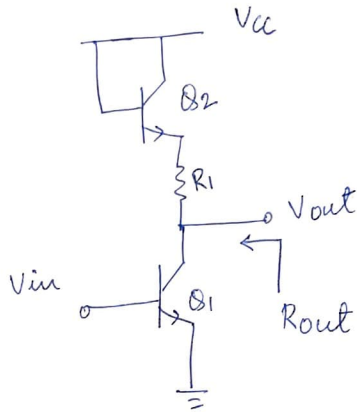
Q2) Calculate the input impedance  $R_{in}$  of the following circuit. Apply the small signal model.



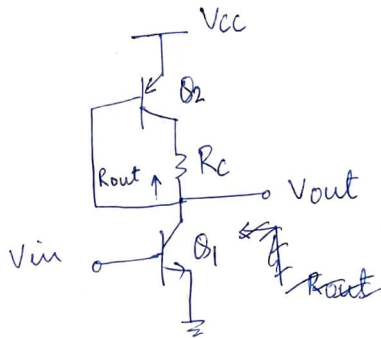
Q3) Use the small signal model to calculate  $R_{in}$ .



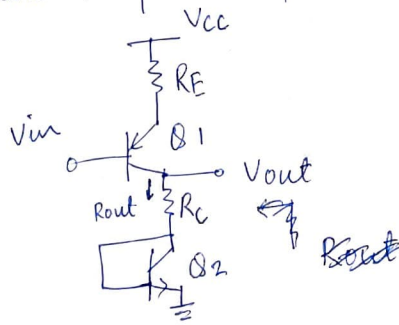
Q4) Use the small signal model to calculate the output impedance  $R_{out}$  for the given circuit.



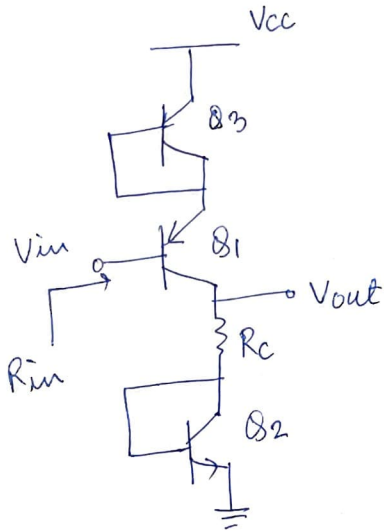
Q5) Calculate the output impedance of the following circuit.



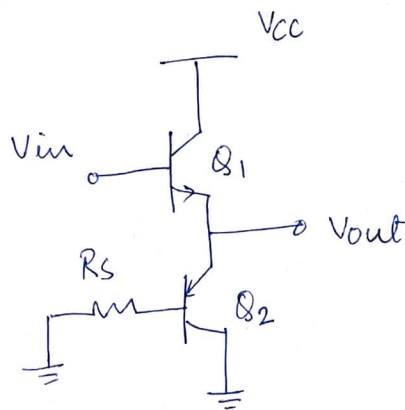
Q6) Calculate the output impedance  $R_{out}$ .



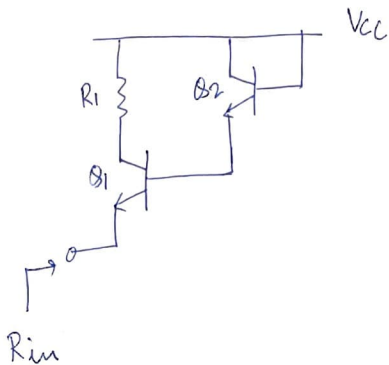
Q7) Calculate input impedance  $R_{in}$ .



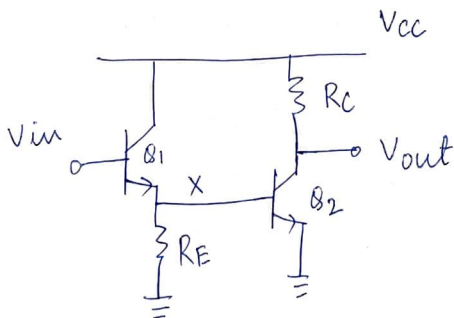
Q8) Calculate the input and output impedances of the circuit.



Q9) Calculate  $R_{in}$  for the given circuit.



Q10) The following circuit is a cascade of an emitter follower and a common emitter stage. Assuming the Early voltage  $V_A = \infty$ , calculate the voltage gain  $\frac{V_{out}}{V_{in}} = \left( \frac{V_{ce}}{V_{in}} \right) \left( \frac{V_{out}}{V_{ce}} \right)$ .



Ref: Fundamentals of Microelectronics  
by Behzad Razavi  
2<sup>nd</sup> Edition, 2014 WILEY