EE210: HW-9

Date: 06/03/2019

Unless stated otherwise, the BJT in the problems given below has the following characteristics
I_S = 2.03x10 $^{-15}$A; β_F =100; β_R =1; $V_A = \infty$; r_{bb}=200Ω; V_T=26mV; C_{jeo} =1pF; C_{jco} =0.5pF; C_{jso} =3pF; m= 0.5; V_{bi}=0.85; τ_F=1ns (For simplicity, include r_{bb} only in high frequency analysis and ignore Cjs)

Q.1 Figure.1 shows a common-base amplifier schematic. Determine voltage gain, input and output resistance and upper cutoff frequency for R_S = 0. Determine the voltage gain and upper cutoff frequency again for the case where source has a resistance of 1K.

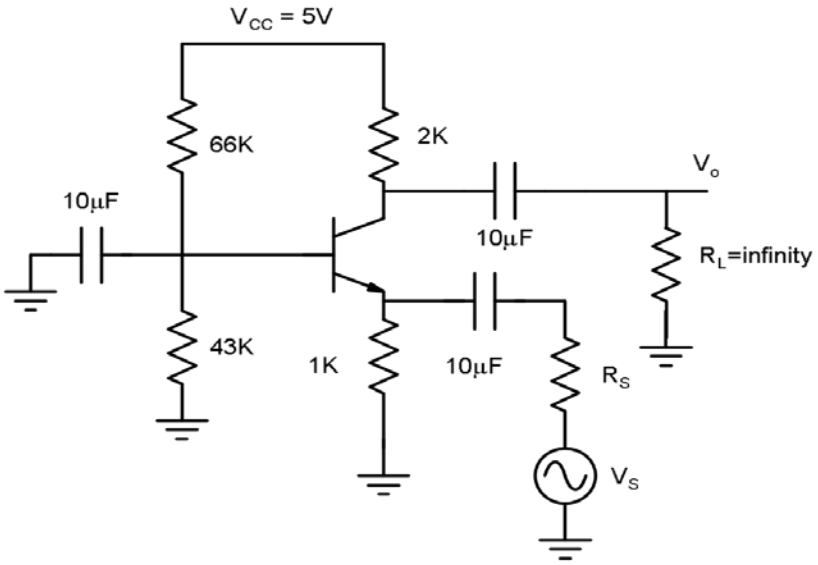

Fig. 1

Q.2 Determine gain, input resistance, output resistance, voltage swing with HD_2 = 10%, upper and lower cutoff frequencies for the Cascode amplifier shown in Fig. 2.

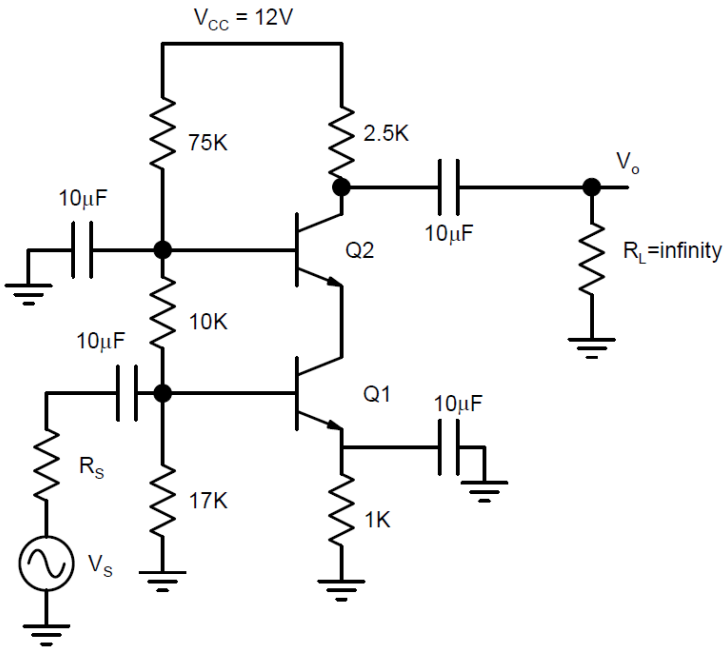

Fig. 2