#Assignment 3
BJT Small Signal Analysis

1. For the network of Fig.1
   a. calculates I_B, I_C and r_e.
   b. Determine Z_i and Z_O.
   c. calculate voltage gain(A_V).
   d. Determine the effect of $r_o = 30\ K\Omega$ on A_V.

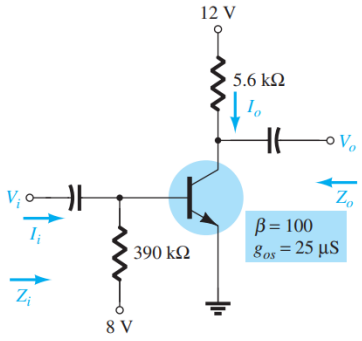

Figure 1

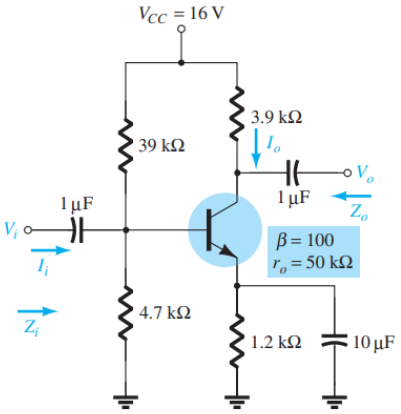

Figure 2

2. For the network of Fig.2
   a. Determine r_e
   b. calculates Z_i and Z_O.
   c. Find A_V
   d. Repeat parts (b) and (c) with $r_o = 25\ K\Omega$.
3. For the network of Fig.3
   a. Determine r_e
   b. Find the dc voltages V_B, V_{CB} and V_{CE}.
   c. Determine Z_i and Z_O.
   d. calculate A_V.

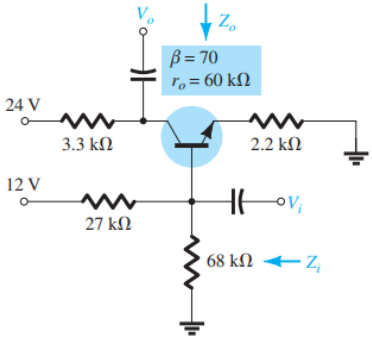

Figure 3

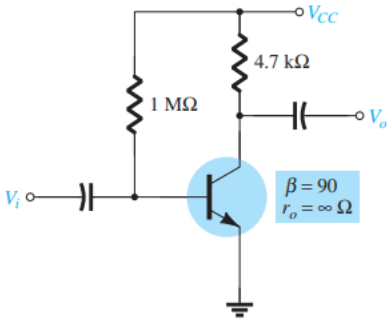

figure 4

4. For the network of Fig 4, determine V_{CC} for a voltage gain of A_V = -160.
5. For the network of Fig.5
   a. Determine r_e
   b. calculates Z_i and Z_O.
   c. Find A_V
   d. Repeat parts (b) and (c) with r_O = 20 KΩ.

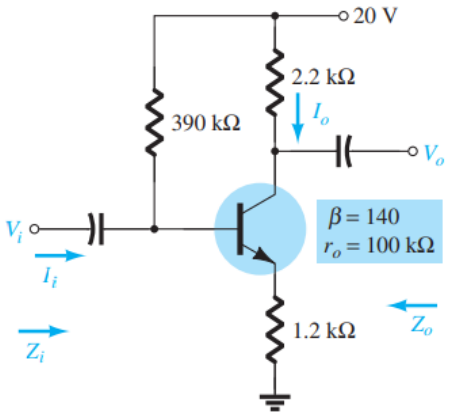

Figure 5

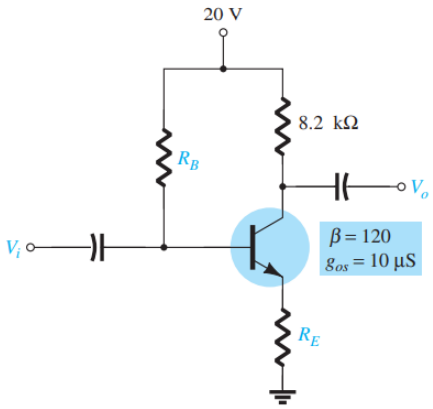

Figure 6

6. For the network of Fig.6, determine R_E and R_B if A_V = -10 and r_e = 3.8 Ω. Assume that $Z_b = \beta R_E$.
7. For the network of Fig. 7
   a. Determine r_e.
   b. Find Z_i and A_V.

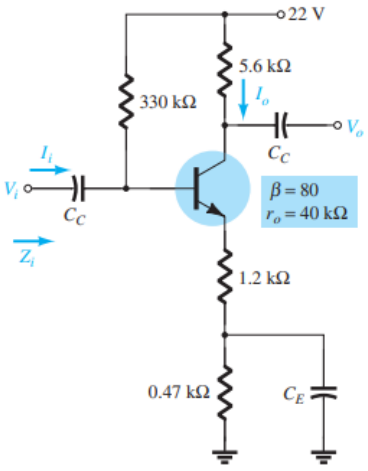

Figure 7

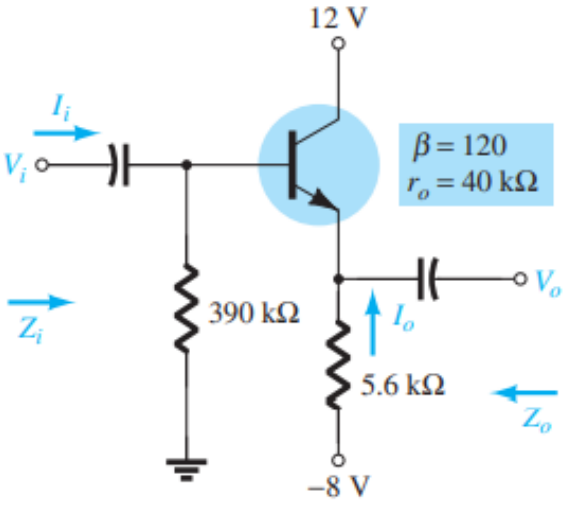

figure 8

8. For the network of Fig.8
   a. Determine Z_i and Z_O.
   b. Find A_V.
   c. calculate V_O if V_i = 1 mV.
9. For the network of Fig.9, Determine A_V.

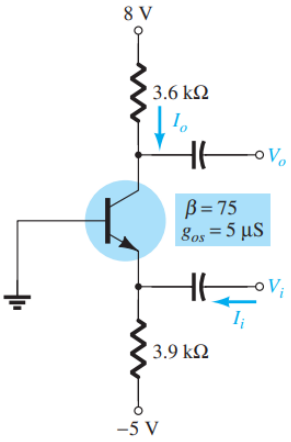

Figure 9

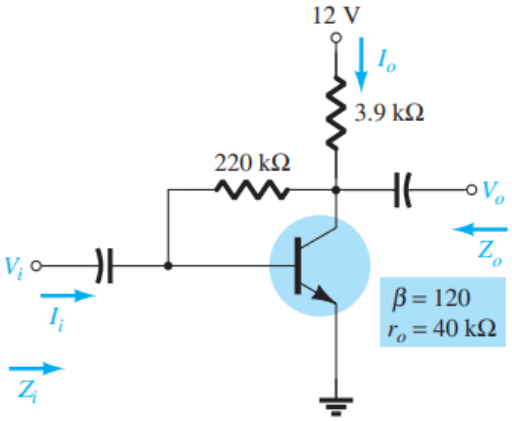

Figure 10

10. For the collector feedback configuration of Fig.10
    a. Determine r_e.
    b. Find Z_i and Z_O.
    c. Calculate A_V.
11. Given r_e= 10Ω, β = 200, A_V = -160, and A_i= 19 for the network of Fig.11, determine the R_C, R_F, and V_{cc}.

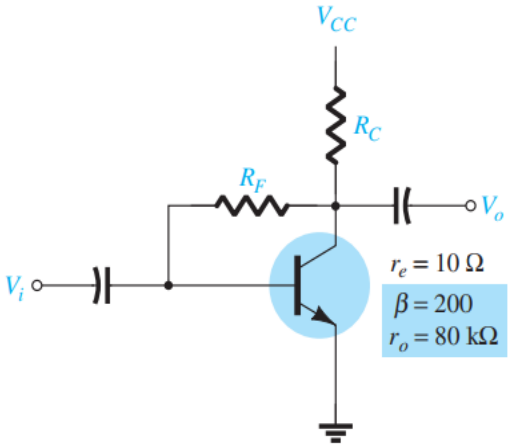

Figure 11

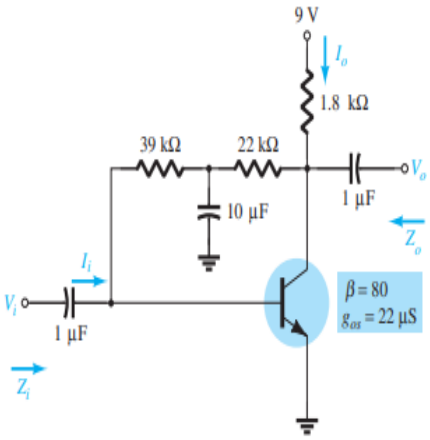

Figure 12

12. For the network of Fig.12
    a. Determine Z_i and Z_O.
    b. Find A_v.