ELEC 401 Homework 1 & 2 Solutions

Review Sheet #3

$$V_{SDQ}=2.02V$$

 $g_m=1.26mA/V$

 $R_{in}=794\Omega$

 $R_{out}=24k\Omega$

 $A_v = 24.2 V/V$

- 4.44 a) V_{GSQ} =1.107V, R_1 =345.2k Ω , R_2 =2291k Ω , R_S =6k Ω
 - b) $g_m=0.7071$ mA/V, $A_v=0.809$, $R_o=1.14$ k Ω
- 6.20 I_{CQ}=1.921mA

 g_m =73.9mA/V, r_π =1.35k Ω , r_o =52.1k Ω

 $A_v = -8.04 V/V$

 $A_1 = -44.9A/A$

 $R_i=1.184k\Omega$

- 6.47 a) I_{BQ} =6.17 μ A, V_{B} =61.7mV, V_{E} =0.762V
 - b) g_m =19mA/V, r_π =4.21kΩ, r_o =304kΩ
 - c) $A_v = 0.906$, $A_l = 14.8$
 - d) A_v=0.728, A_I doesn't change
- 7.11 a) $A_V = -159$
 - b) τ_1 =5.31ms, τ_2 =332ns
 - c) $C_c = 932 nF$, $C_L = 55.3 pF$
- 7.32 a) I_{CO} =198 μ A, V_{F} =-717mV, V_{c} =1.483V, R_{c} =7.65k Ω
 - b) r_{π} =15.73k Ω , g_{m} =7.627mA/V, A_{v} =-25.8

c)
$$f_C=rac{1}{2\pi(R_C+R_L)C_C}$$
 , $f_E=rac{1}{2\piig(rac{r_\pi+R_i}{eta+1}ig)C_E}$

- d) $C_c=115nF$, $C_E=74.8\mu F$
- 7.33 a) V_{GS} =1.8V, R_S =6.4k Ω , V_D =2.2V, R_D =5.6k Ω
 - b) $g_m = 1 \text{ mA/V}$, $f_A = 4.97 \text{ Hz}$, $f_B = 36.8 \text{ Hz}$
 - c) $f_{B}=31.8$ Hz
- 7.39 V_{GS} =3.55V, g_m =1.55mA/V, C_L =121pF, A_V =0.4V/V
- 7.40 I_{BQ} =11.3 μ A, I_{CQ} =1.13mA, r_{π} =2.3k Ω , g_{m} =43.46mA/V, A_{m} =43.7dB f_{L} =4.83Hz, f_{H} =3.15MHz