國立高雄海洋科技大學學年度碩士班入學考試

微電子工程研究所—微電子學試題

(※需使用計算機)

1. (a)What is the output voltage in figure 1 ?

(b)What is the output voltage if R_2 opens?

(c)What is the output voltage if R_5 opens? (20%)

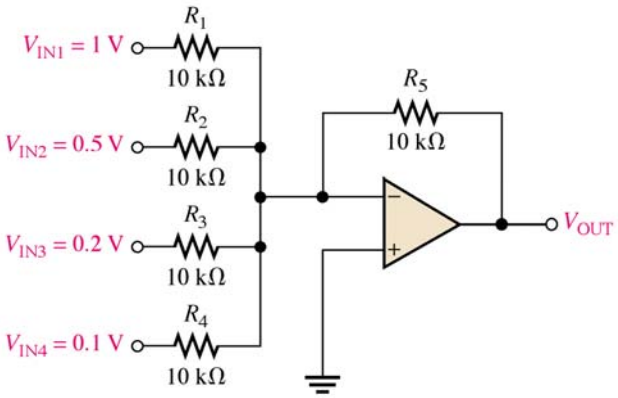

Figure 1.

2. (a) What is the voltage gain in figure 2(a)?

(b) What is the voltage gain in figure 2(b)?

(c) What is the voltage gain in figure 2(c)? (20%)

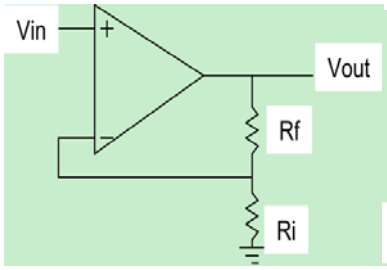

Figure 2(a)

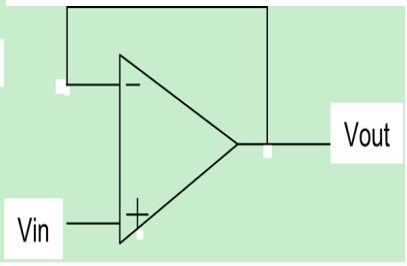

Figure 2(b)

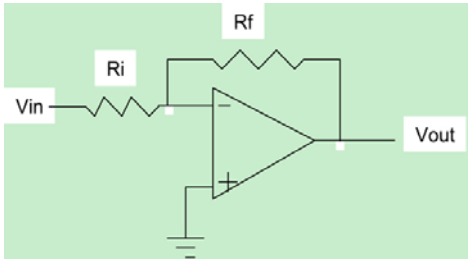

Figure 2(c)

3. If the cut in voltage of a diode is 0.7V, please draw the output signals of the following circuits (Fig.3). (20%)

背面有題

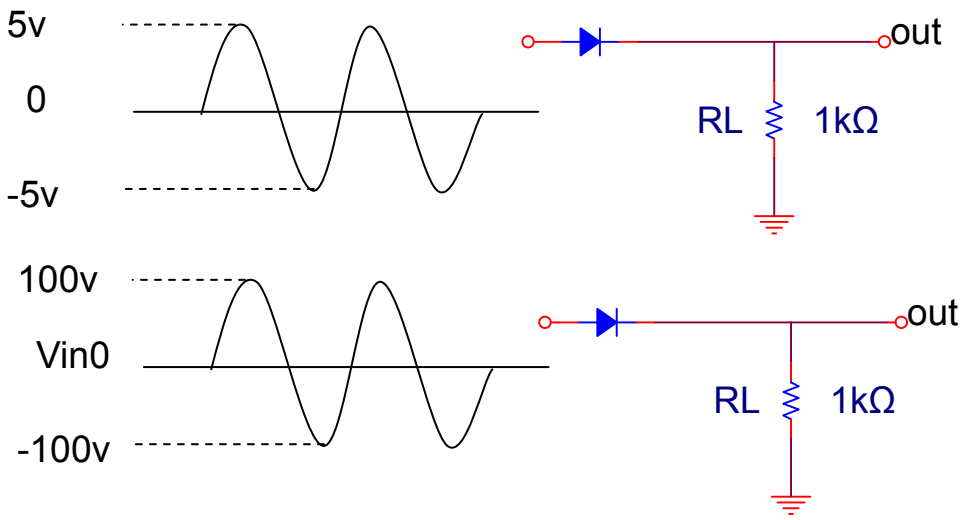

Fig.3

4. Consider the circuit in shown Fig. 4. The transistor parameters are β=100 and V_A=80V. Determine R_i, $A_V=v_o/v_i$ and $A_i= i_o/i_s$. (20%)
5. Consider the circuit in shown Fig. 5. Assume transistor parameters of V_{TP}= -0.4V, $\frac{1}{2}u_pC_{ox} = 20uA/V^2$, and λ=0. The transistor width-to-length ratios are $(W/L)_1$=20, $(W/L)_2$=10 and $(W/L)_3$=5. (a) Determine I_o, I_{REF}, V_{SG1} and V_{SG3}. (b) what is the largest value of R such that M_2 remains biased in the saturation region? (20%)

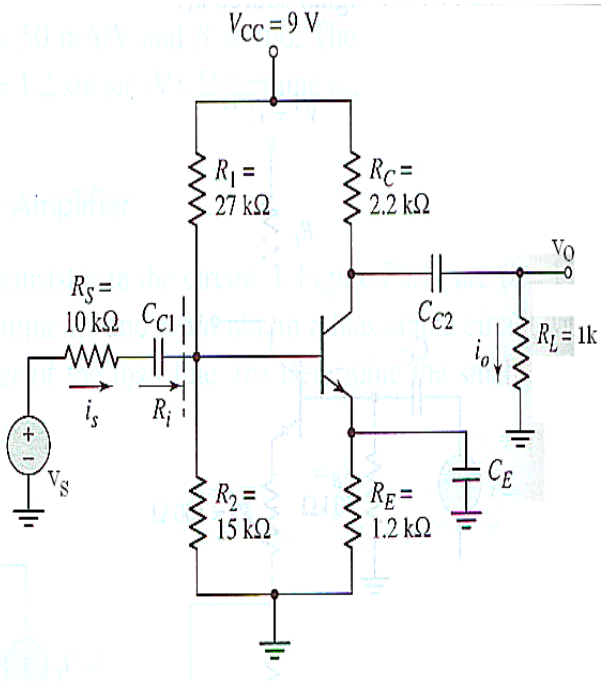

Fig. 4

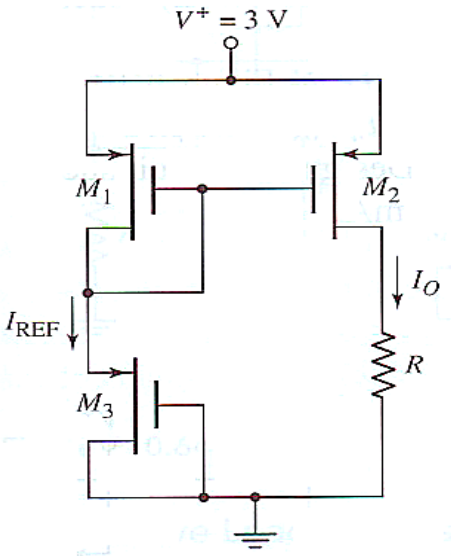

Fig. 5

試題結束