Q1. For the circuit of Fig. P1, each transistor has $|V_{ov}| = 0.2V$ and $|V_A| = 10V$ (including the current sources where each are built with a single transistor).
a) Find V_o/V_s assuming $d \approx 0$.
b) Find R_{out}.

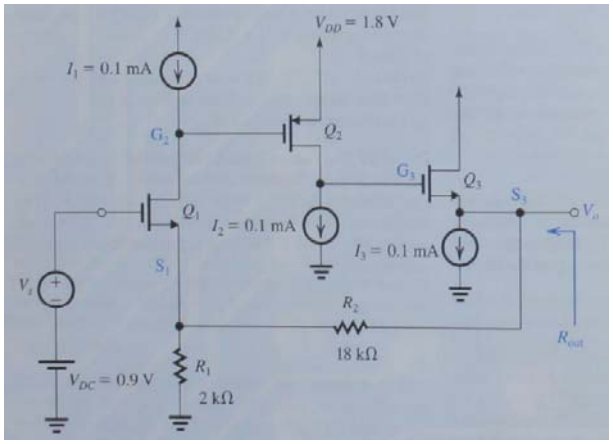

Fig P1

Q2. For the circuit of Fig. P2, assume $v_o = 0$ for $v_s = 0$, $|V_t| = 0.7V$, $|V_A'| = 24V/\mu m$ $\mu_n C_{ox} = 2\mu_p C_{ox} = 120\mu A/V^2$.
Assume bias currents are ideal.
a) Find V_o/V_s.
b) Find R_{out}.

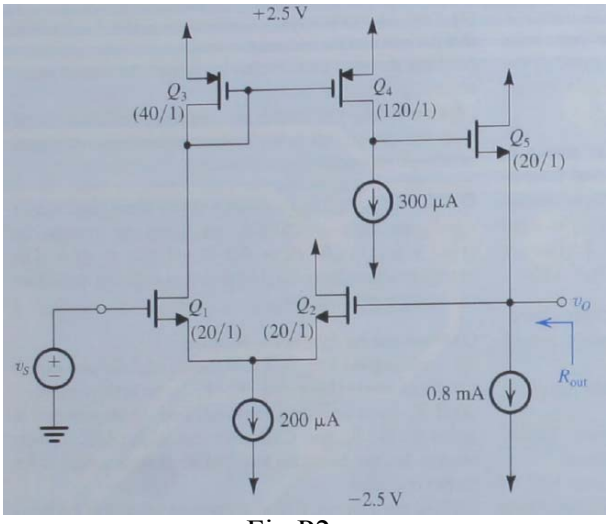

Fig P2

Q3. For the circuit of Fig. P3, $R_s = 9k$, $R_L = 1k$, $R_1 = 10k$ and $R_2 = 90k$.
A1 has $82k\Omega$ diff R_{in}, 20V/V open circuit diff voltage gain and $3.2k\Omega$ R_{out}.
A2 has $5k\Omega$ R_{in}, 20mA/V short circuit transconductance and $20k\Omega$ R_{out}.
A3 has $20k\Omega$ R_{in}, $1V/V$ open circuit voltage gain and $1k\Omega$ R_{out}.
a) Find V_o/V_s assuming $d \approx 0$.
b) Find R_{in} and R_{out}.

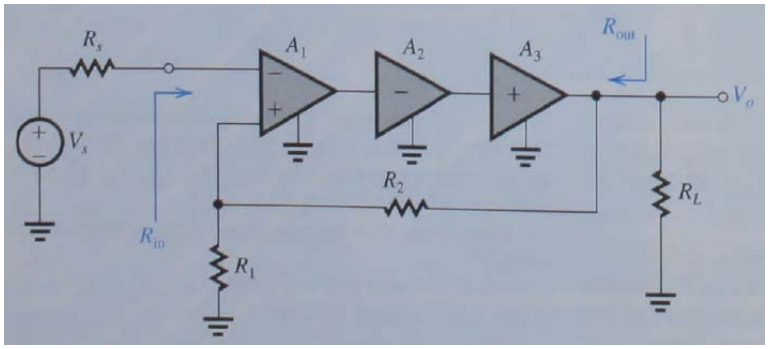

Fig P3