

**MASSACHUSETTS INSTITUTE OF TECHNOLOGY**  
DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

6.101 Introductory Analog Electronics Laboratory  
Spring 2003  
Problem Set #4  
**Issued: 3/05/03**  
**Due: 3/12/03**

Remember to use standard 5% resistor values. Assume  $V_T = 25\text{mV}$ ,  $V_{BE(ON)} = 0.6\text{V}$ , and that all capacitors in the circuits are very large. Make appropriate approximations.

4.1) Neamen 9.4 page 564, change the voltage gain to  $-10$ .

4.2) J&J 3.9 page 75

4.3) Neamen 9.25 page 568

4.4) J&J 4.11 page 100

4.5) J&J page 155, use  $R_2 = 1\text{K}\Omega$

4.6) Neamen 15.36 page 993, but change  $V_H = +12\text{V}$ ,  $V_L = -12\text{V}$ , and  $R_2 = 56\text{K}\Omega$ .

J&J: Operational Amplifier Circuits by Johnson & Jayakumar