



Sheet (1)

- (a) What are the connections to a basic OP-AMP?

(b) Compare a practical OP-AMP to an ideal OP-AMP and describe some of the characteristics of a practical OP-AMP?

(c) List the amplifier stages in a typical OP-AMP?

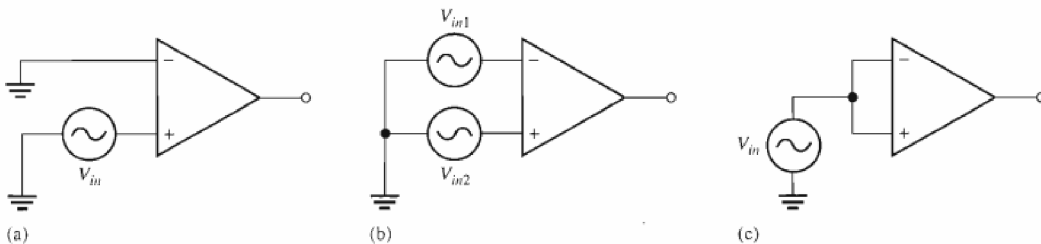
(d) What does a differential amplifier amplify?

(e) Distinguish between differential and single – ended inputs?

(f) For a given value of open loop gain, does a higher CMRR result in a higher or lower Common Mode Gain?

(g) Two – IC OP-AMP are available to you their characteristics are listed below. Choose the one you think is more desirable.
OP-AMP 1: $Z_{in} = 5M\Omega$, $Z_{out} = 100\Omega$, $A_{OL}=100,000$.
OP-AMP 2: $Z_{in} = 10M\Omega$, $Z_{out} = 75\Omega$, $A_{OL}=150,000$.

- Identify the type of input mode for each OP-AMP in the following Figure.



- The open loop gain of a certain OP-AMP is 175,000. Its common Mode gain is 0.18. Determine CMRR in Decibel.
- Determine the bias current I_{Bias} , given that the input currents to an OP-AMP are $8.3\mu A$ and $7.9\mu A$. Then calculate the input offset current.
- How long does it take the output voltage to go from $-10V$ to $+10V$, if the slew rate is $0.5V/\mu s$.

Good Luck