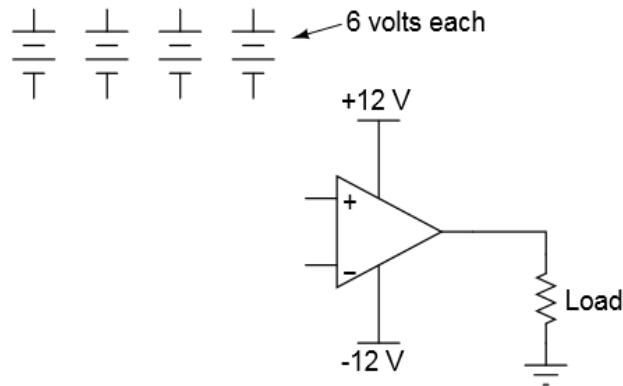


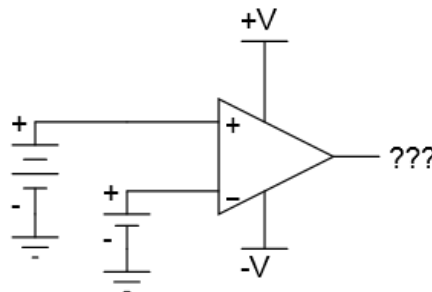
1. When are direct-coupled amplifiers used in a circuit?
2. How does a differential amplifier differ from conventional amplifier?
- 3.

Many op-amp circuits require a *dual* or *split* power supply, consisting of three power terminals: $+V$, $-V$, and Ground. Draw the necessary connections between the 6-volt batteries in this schematic diagram to provide $+12\text{ V}$, -12 V , and Ground to this op-amp:



4. What are the characteristics of common-base circuit?
5. What are the characteristics of Common-emitter circuit?
6. What are the characteristics of common-collector circuit?
7. What are the four main methods of coupling transistor amplifiers?
- 8.

Ideally, what should the output voltage of an op-amp do if the noninverting voltage is greater (more positive) than the inverting voltage?

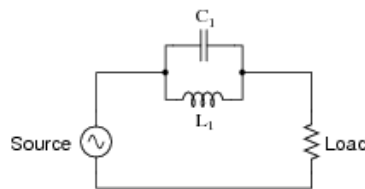


9. How is a transistor used to provide amplification?
10. How do RF amplifiers differ from other amplifiers?
11. What is the purpose of a power supply?
12. What is the simplest filter configuration?

In very simple, qualitative terms, rate the impedance of capacitors and inductors as "seen" by low-frequency and high-frequency signals alike:

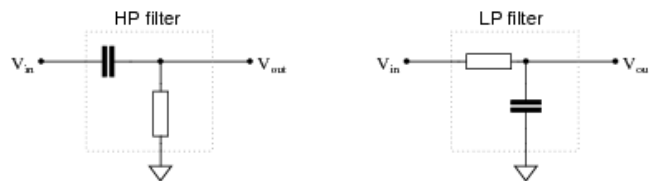
- Capacitor as it "appears" to a low frequency signal: (high or low) impedance?
 - Capacitor as it "appears" to a high frequency signal: (high or low) impedance?
 - Inductor as it "appears" to a low frequency signal: (high or low) impedance?
 - Inductor as it "appears" to a high frequency signal: (high or low) impedance?
- 13.
14. Explain how an RC low-pass filter functions.

What kind of filtering action (high-pass, low-pass, band-pass, band-stop) does this resonant circuit provide?



15.

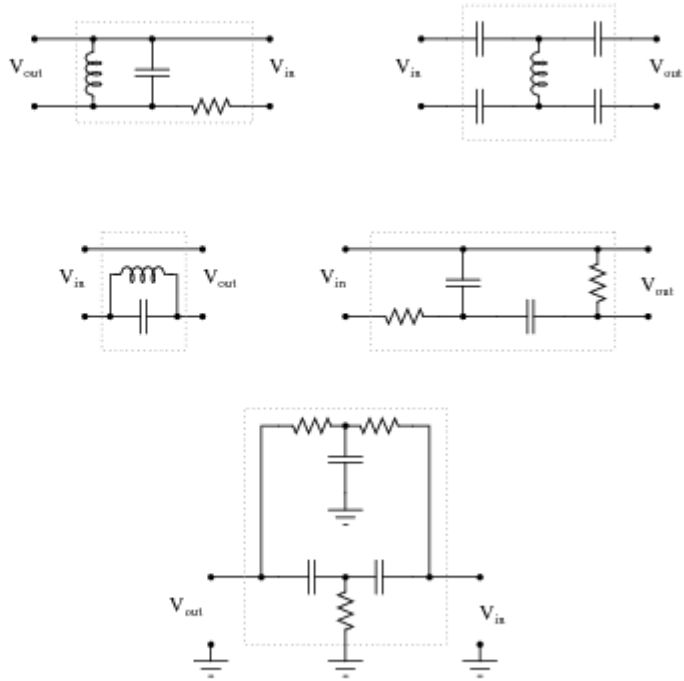
Filter circuits don't just attenuate signals, they also shift the phase of signals. Calculate the amount of phase shift that these two filter circuits impart to their signals (from input to output) operating at the cutoff frequency:



16.

17. What is the difference between active and passive filters?

Identify the following filter types, and be prepared to explain your answers:



18.

19. What is a high band filter?

20. What is a High Pass Filter?

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