

**JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY**  
**Electronics and Communication Engineering**  
**Electrical Science-II (15B11EC211)**  
**Tutorial Sheet: 6**

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Q.1 [CO2] Assuming the OP-Amp to be ideal, the voltage gain of amplifier shown in Figure (a) is

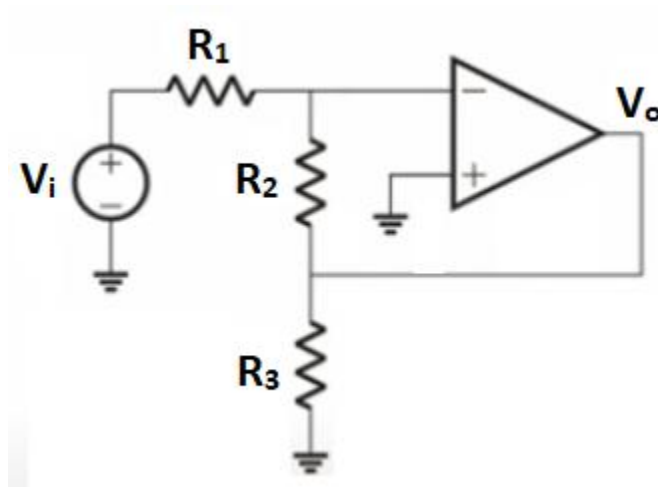


Fig. (a)

Q.2 [CO2] For the Op-Amp circuit shown in the Figure (b),  $V_o$  is

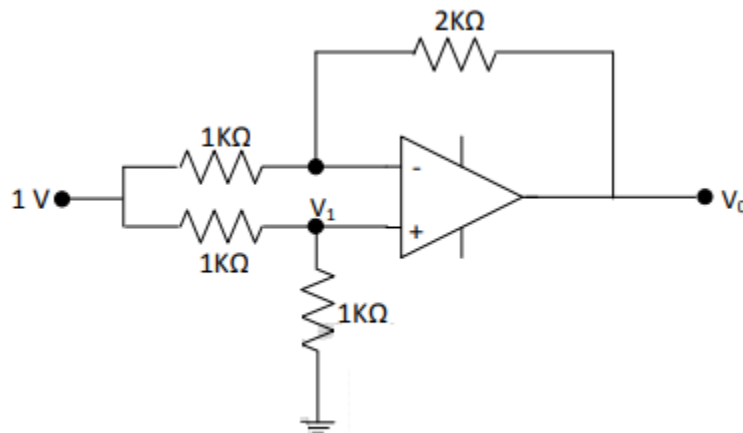
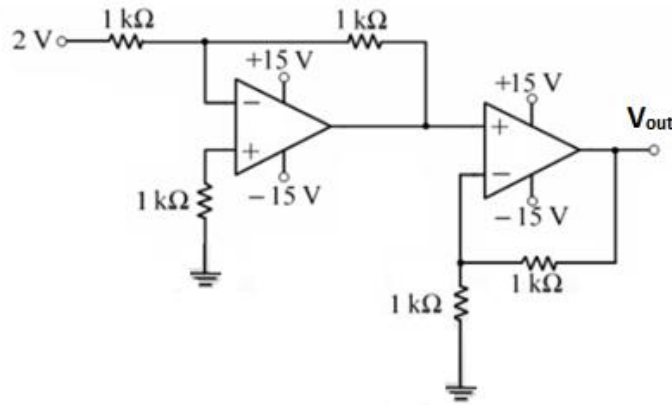


Fig. (b)

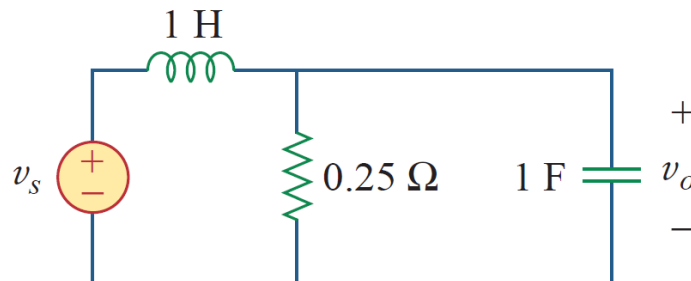
**Q.3 [CO2]** In the circuit shown below, the OP-AMPs are ideal, then out output (in volts) is



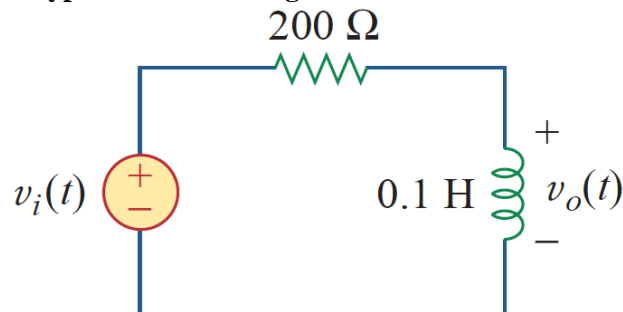
**Fig. (c)**

**Q.4 [CO2]** Show that a series LR circuit is a lowpass filter if the output is taken across the resistor. Calculate the corner frequency  $f_c$  if  $L = 2 \text{ mH}$  and  $R = 10 \text{ k}\Omega$ .

**Q.5 [CO2]** Find the transfer function  $V_o/V_s$  of the circuit shown in Figure. Show that the circuit is a lowpass filter.



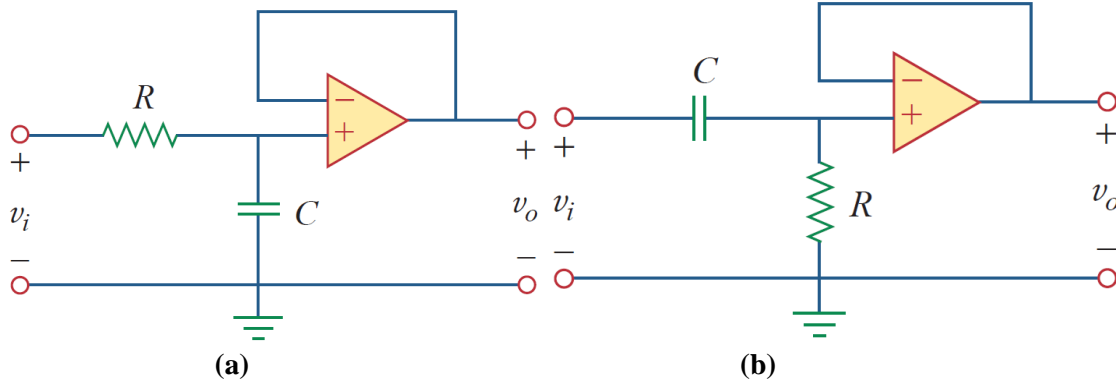
**Q.6 [CO2]** Determine what type of filter is in Figure. Calculate the corner frequency  $f_c$ .



**Q.7 [CO2] Design a series RLC type bandpass filter with cutoff frequencies of 10 kHz and 11 kHz. Assuming  $C = 80 \text{ pF}$ , find  $R$ ,  $L$ , and  $Q$ .**

**Q.8 [CO2] Obtain the transfer function of a highpass filter with a passband gain of 10 and a cutoff frequency of 50 rad/s.**

**Q.9 [CO2] Find the transfer function for each of the active filters shown in Figures.**



**Q.10 [CO2] Obtain the transfer function of the active filter shown in Figure. What kind of filter is it?**

