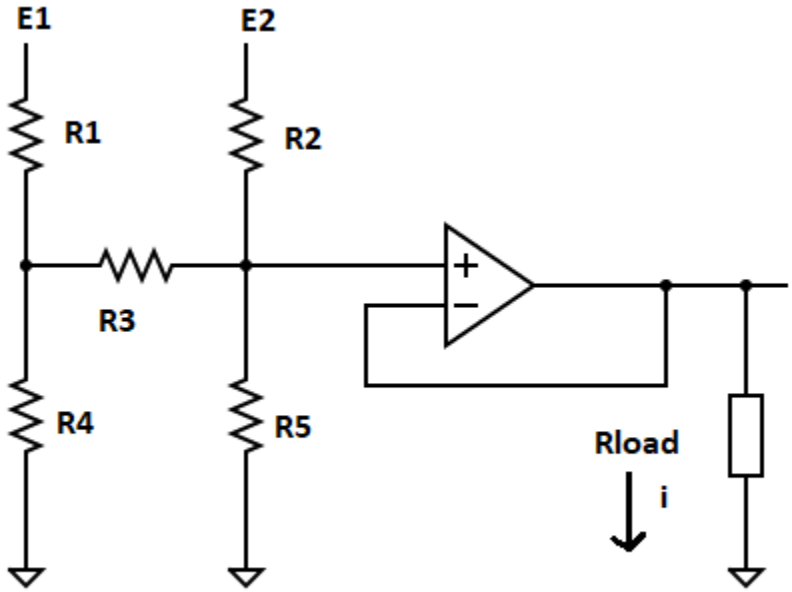
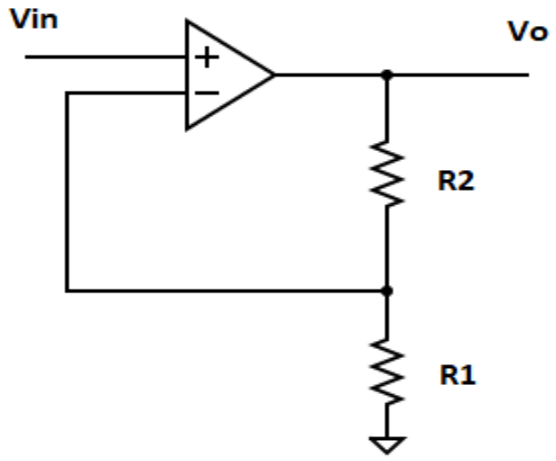
EE 1100 Basic Electrical Engineering
March – June 2023
Tutorial 8 Opamp Circuits

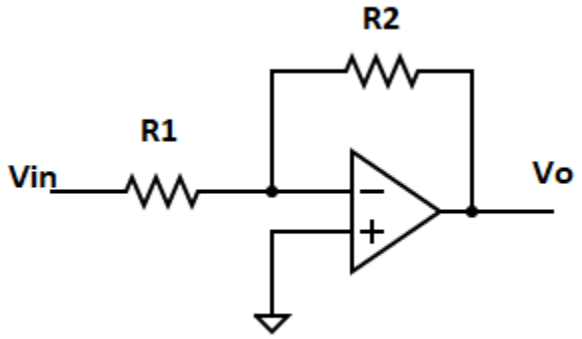
1) Find the expression for current **i** through load resistance **Rload**.Assume opamp is operating in linear region



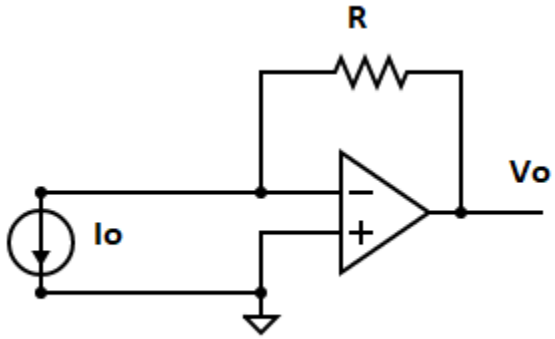
2) Find the output voltage **Vo**. Take Vin = 5 V, R1 = 4 ohms and R2 = 8 ohms.



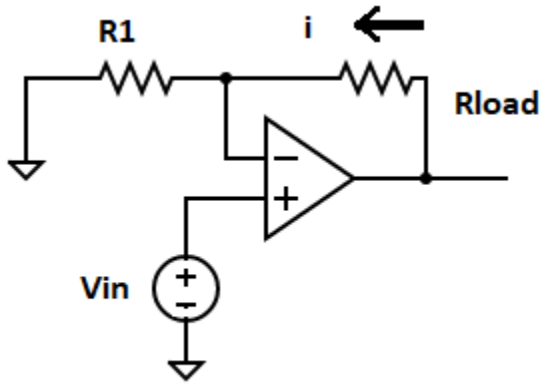
3) Find the output voltage **Vo**. Take Vin = 3 V, R1 = 5 ohms and R2 = 7 ohms.



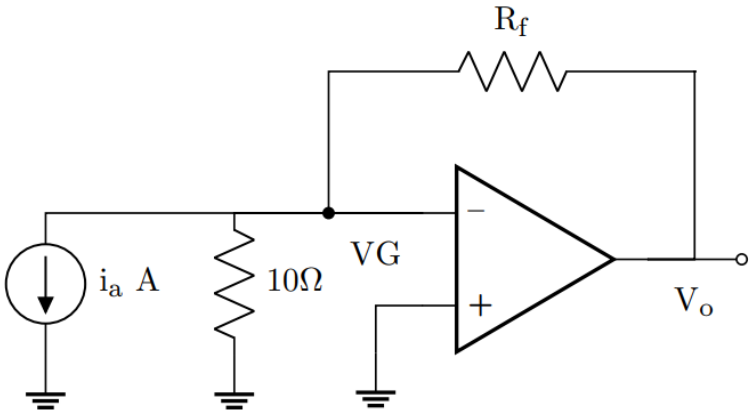
4) What will be the voltage **Vo** at the output of the op amp? Take Io = 2 A and R = 5 ohms.



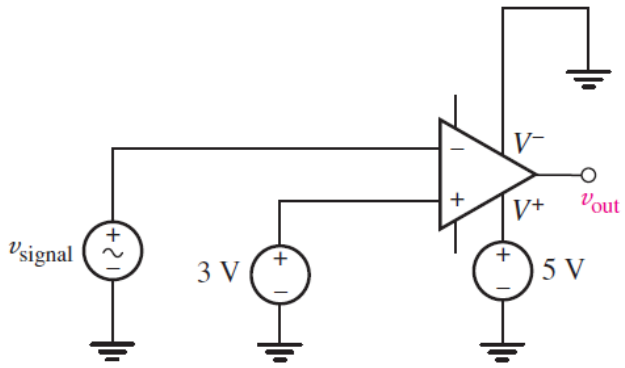
5) What will be the current **i** through the load resistance **Rload**? Take Vin = 6 V and R1 = 2 ohms.



6. A third year EE student at IITM wanted to measure the torque of a DC motor. He knew that for that particular motor, the relationship between the torque and the armature current is given by the relationship $T_a = k_a.i_a$ and i_a are the torque constant and armature current of the motor respectively. ka = 5 Nm/A. He knew that the circuit shown in the figure can be used and its output voltage is to be fed to a voltmeter. Instruct him on what the value of the feedback resistance Rf should be such that the voltmeter shows the magnitude of the torque.



7. Consider the input signal to the following circuit is a sine-wave, *$V_{in}(t) = 4 Sin (100t) V.$* Plot the shape of the output.



8. Consider that a sine-wave signal is provided to the following circuit at Vin. Analyse and find out the expected shape of the output signal at Vout. Assume that the diodes have a finite forward voltage drop (say 0.7V), and infinite reverse bias resistance.