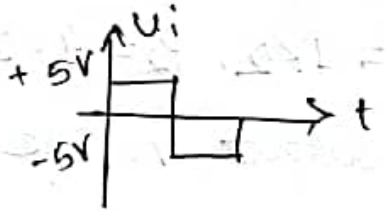
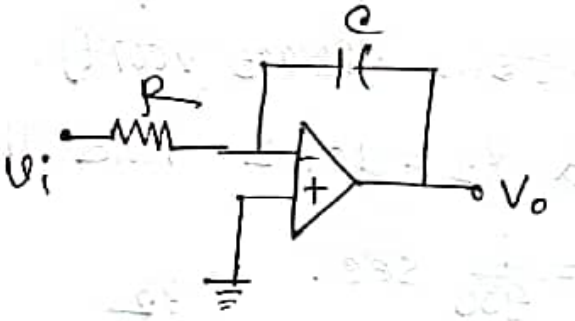
Assignment (15 Marks)

(01). Using an ideal op-amp, design a circuit that will take V_1, V_2 and V_3 as inputs and produce the following output:

$$V_{out} = -10V_1 + 5\frac{dV_2}{dt} + 2\int V_3 dt$$

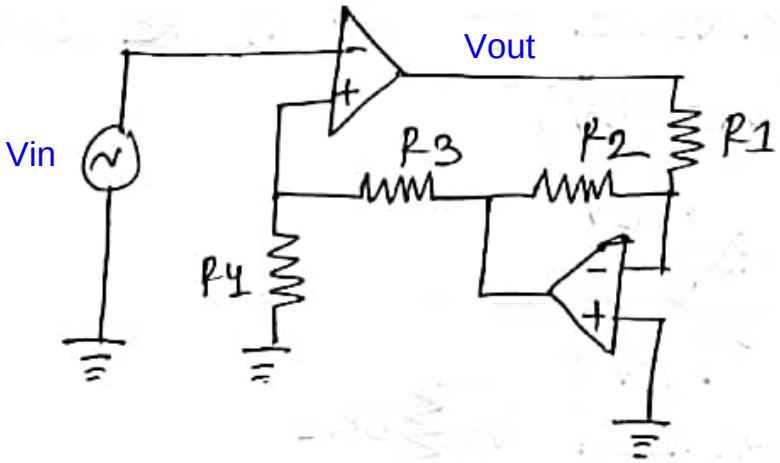
(02). A 10 V P-P and 1KHz rectangular pulse is input, draw the output waveshape for the following circuit:



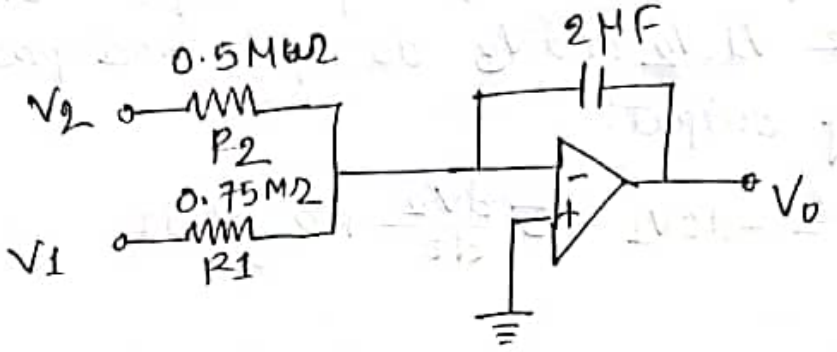


R=50K
C=0.02μF

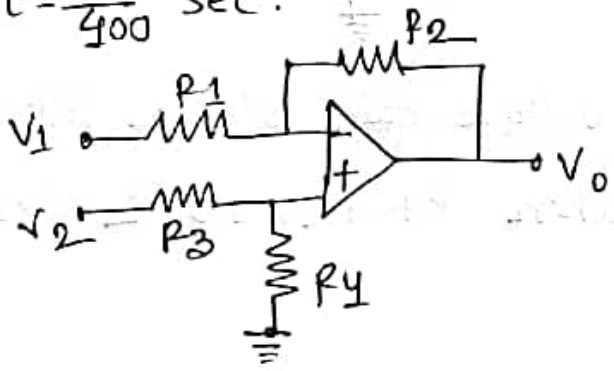
(03). Determine the voltage gain of the following op amp circuit, when $R_1 = R_2 = 15\ K\Omega$ and $R_3 = R_4 = 5\ K\Omega$



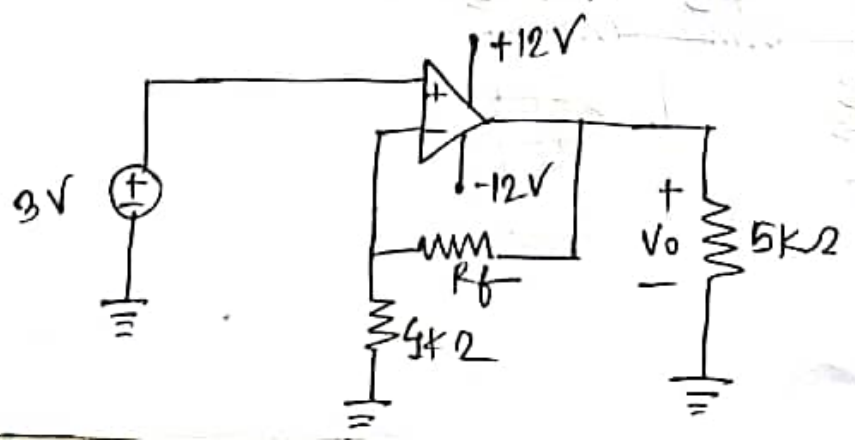
(04) for the ideal op-amp given below, $V_1 = 10\sin(200t)$ and $V_2 = 15\sin(200t)$, Find the output voltage, V_o.



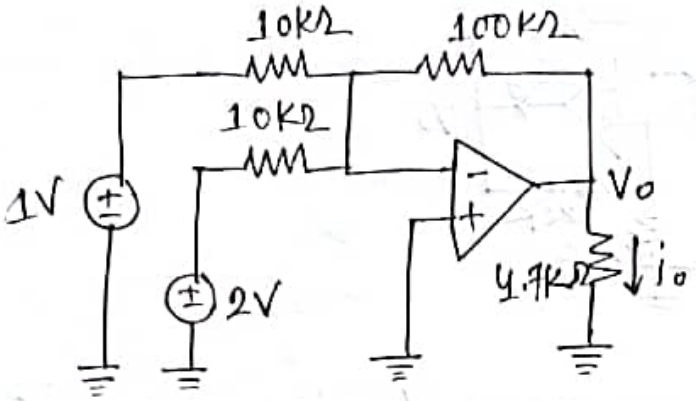
(05). In the following circuit, $V_1 = 10\sin(200\pi t)$, $V_2 = $ ~~$10\sin$~~ $10\cos(200\pi t)$, $R_1 = 1K\Omega$, $R_2 = 4K\Omega$, $R_3 = 5K\Omega$ and $R_4 = 10K\Omega$. Find the output voltage when $t = \frac{1}{400}$ sec.



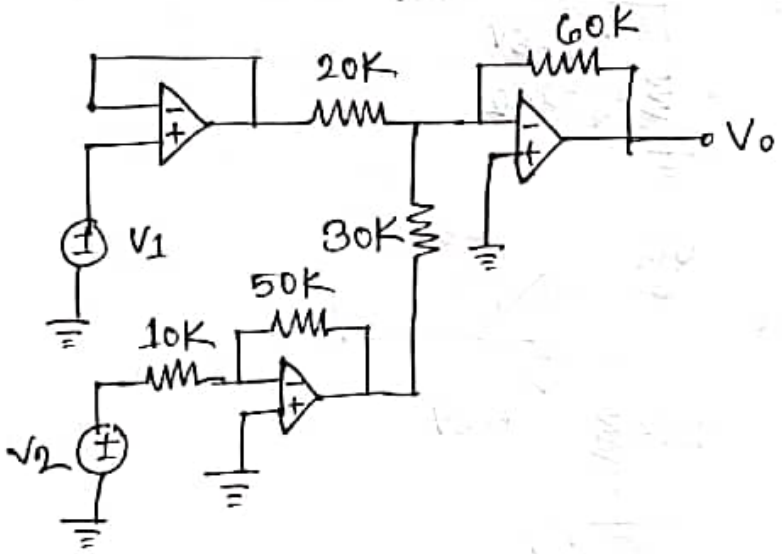
(06). Find the value of R_f in the following circuit. ($V_o = 75V$)



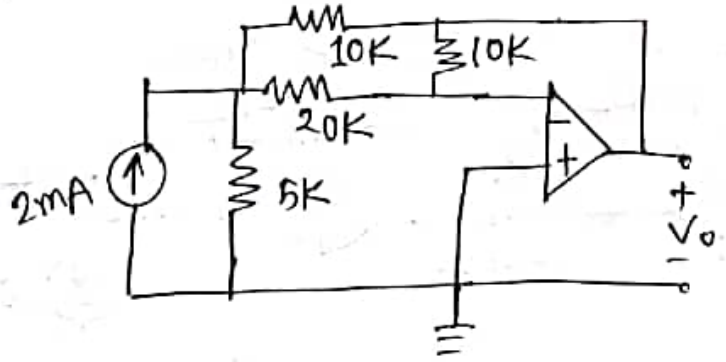
(07) Find i_o in the following ideal op-amp.



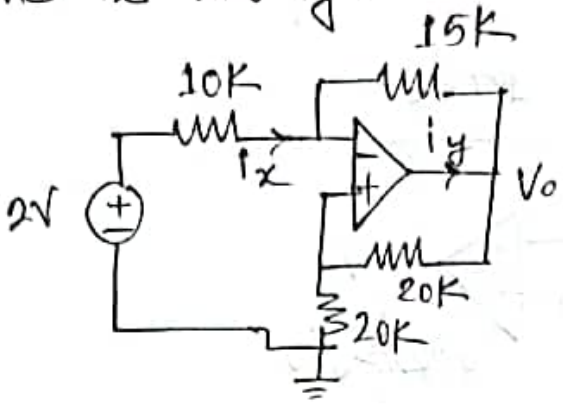
(08) Find the output of the op-amp circuit shown in figure below. If $V_1 = 7V$ and $V_2 = 3.1V$



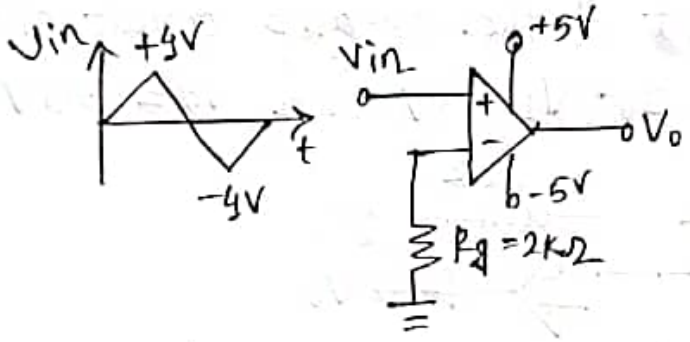
(09) Determine the output voltage V_o

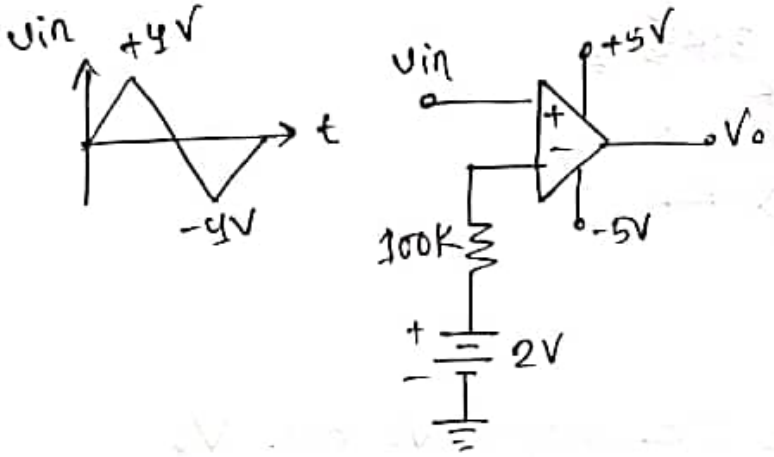


(10) Find i_x and i_y



(11). Draw the output shape of the op-amp circuit.





(12). Find i_o in the op-amp circuit.