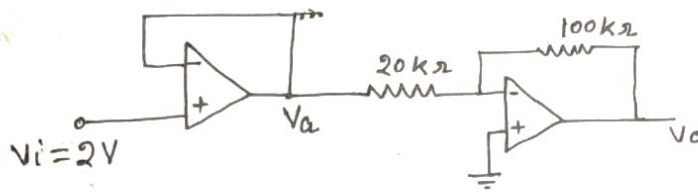


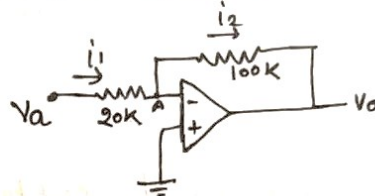
Prob calculate the o/p voltage for the ckt



→ First op-amp configuration is Voltage follower.

$$\therefore V_a = V_i = 2V.$$

Now the ckt will be



Apply KCL at node A

$$i_1 = i_2$$

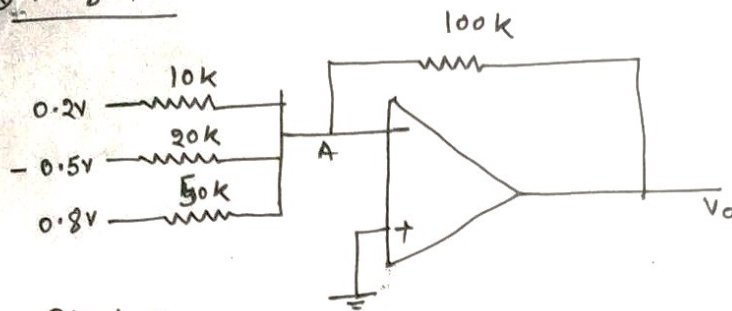
$$\frac{V_a - 0}{20} = \frac{0 - V_o}{100}$$

$$\frac{2}{20} = \frac{-V_o}{100}$$

$$V_o = - \frac{2 \times 100}{20} = -10V$$

So o/p voltage  $V_o = \underline{-10V}$

\* Prob-1

Find  $V_o$ .

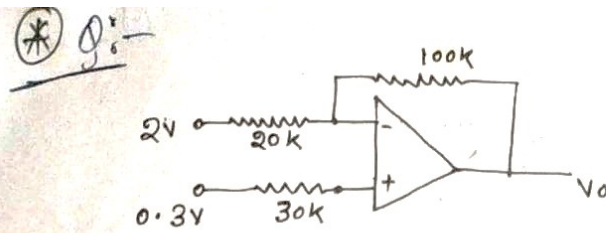
→ By applying KCL at node A

$$\frac{0.2-0}{10} + \frac{-0.5-0}{20} + \frac{0.8-0}{50} = \frac{0-V_o}{100}$$

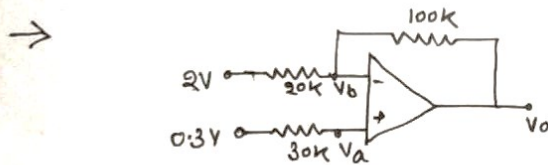
$$\frac{0.2}{10} - \frac{0.5}{20} + \frac{0.8}{50} = -\frac{V_o}{100}$$

$$V_o = -[2 - 2.5 + 1.6]$$

$$= -[3.6 - 2.5] = \underline{\underline{-1.1V}}$$



Find out  $V_o$



As there is no input current into the op-amp, so voltage drop across 30k resistor is zero.

$$\therefore V_a = 0.3V.$$

$$V_b = V_a = 0.3V.$$

$$\therefore \frac{2 - 0.3}{20} = \frac{0.3 - V_o}{100}$$

$$5 \times 1.7 = 0.3 - V_o$$

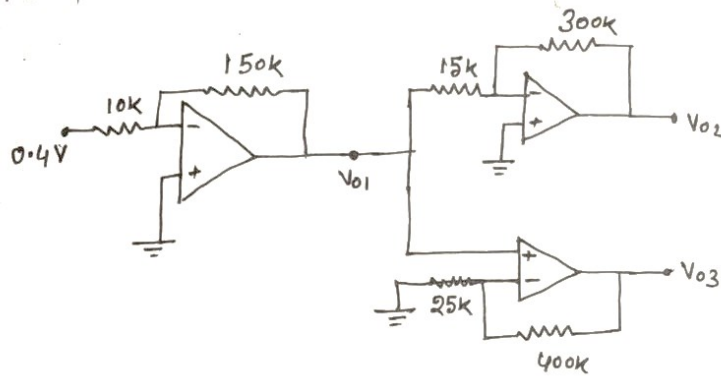
$$V_o = 0.3 - 5 \times 1.7$$

$$= 0.3 - 8.5$$

$$= \underline{\underline{-8.2V}}$$

Q:- Find  $V_{o1}$ ,  $V_{o2}$  &  $V_{o3}$  for given circuit.

② 10

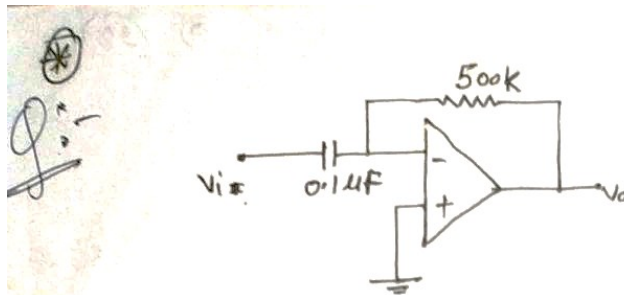


$$\begin{aligned} V_{o1} &= \left( -\frac{R_f}{R_i} \right) 0.4 \text{ V} \\ &= - \left( \frac{150}{10} \times 0.4 \right) \text{ V} \\ &= \underline{-6 \text{ V.}} \end{aligned}$$

$$\begin{aligned} V_{o2} &= \left( -\frac{R_f}{R_i} \right) V_{o1} \\ &= - \frac{300}{15} \times (-6) \text{ V} \\ &= \underline{120 \text{ V.}} \end{aligned}$$

$$\begin{aligned} V_{o3} &= \left( 1 + \frac{R_f}{R_i} \right) \cdot V_{o1} \\ &= \left( 1 + \frac{400}{25} \right) \cdot (-6) \\ &= (1 + 16) (-6) = \underline{-102 \text{ V}} \end{aligned}$$





Find o/p  $V_o$  for  $V_i = (3 \sin 5t + 10 \cos 3t)$

→

$$i_c = i_f$$

$$C \cdot \frac{dV_i}{dt} = \frac{-V_o}{500 \times 10^3}$$

$$V_o = -500 \times 10^3 \times 0.1 \times 10^{-6} \cdot \frac{dV_i}{dt}$$

$$= -0.05 \cdot [15 \cos 5t - 30 \sin 3t]$$

$$= [-0.75 \cos 5t + 1.5 \sin 3t]$$