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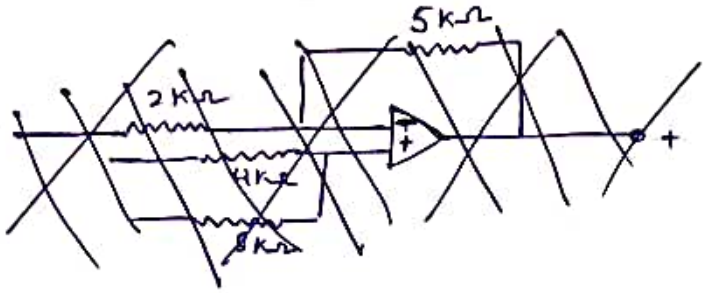
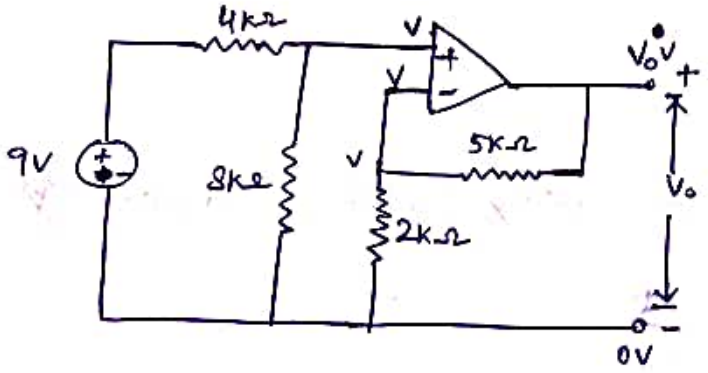
Electrical Science - II

Take Away - 5

Q.1.





$$\frac{V-9}{4} + \frac{V-0}{8} = 0 \quad -(1) \quad \rightarrow \quad \frac{V}{4} + \frac{V}{8} = \frac{9}{4}$$

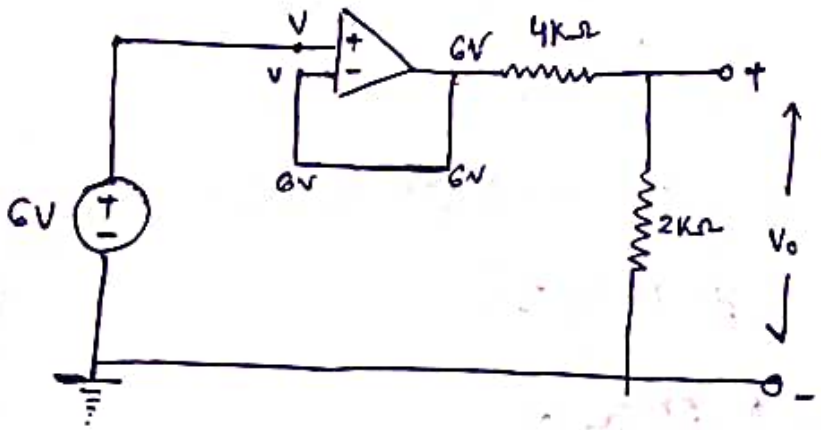
$$\frac{V-V_o}{5} + \frac{V-0}{2} = 0 \quad -(2) \quad \rightarrow \quad \frac{V}{5} + \frac{V}{2} - \frac{V_o}{5} = 0$$

$$\frac{3V}{2} = \frac{9}{4} \rightarrow V = 6$$

$$\frac{7V}{10} - \frac{V_o}{5} = 0$$

$$\frac{42}{10} - \frac{V_o}{5} = 0 \rightarrow \frac{42}{10} = \frac{V_o}{5} = 21\ V$$

Q.2.



~~6o~~ ~~i~~ ~~6~~. ~~6V~~ $V = 6V$

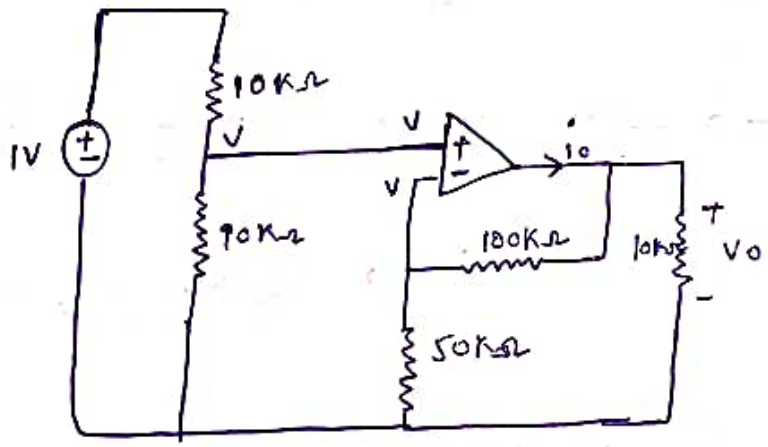
$6 = 6i$

$i = 1mA$

$V_o = 2V$

$P_{4K\Omega} = i^2R = 10^{-6} \times 4 \times 10^3 = 4mW$

Q.3



$\frac{V-1}{10} + \frac{V-0}{90} = 0$ — (1) $\longrightarrow V = 0.9$

$\frac{V-V_o}{100} + \frac{V-0}{50} = 0$ — (2)

$i_o = \frac{V_o - V}{100K\Omega} + \frac{V_o}{10K\Omega}$

$\frac{0.9-V_o}{100} + \frac{0.9}{50} = 0$

$= \frac{1.8}{100} + \frac{2.7}{10}$

$V_o = 2.7V$

$= 0.288mA$