ECE 301, H.W A6

October 20, 06

11-9

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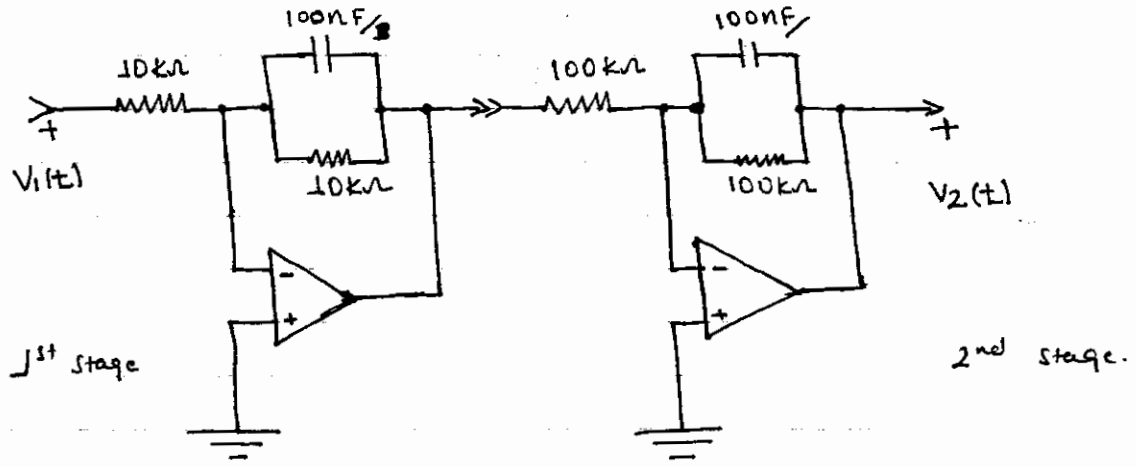

Qn. find the Voltage transfer function $T_V(s) = \frac{V_2(s)}{V_1(s)}$.

for the 1st stage.

$$Z_2(s) = \frac{1}{10^{-7}\cdot s + \frac{1}{10^4}} = \frac{10^7}{(s+1000)}$$

and

$$Z_1(s) = 10^4$$

$$\therefore T_{V1}(s) = \frac{-Z_2}{Z_1} = \frac{-1000}{s+1000}$$

For the 2nd Stage.

$$Z_2(s) = \frac{1}{10^{-7}s + \frac{1}{10s}} = \frac{10^7}{(s+100)}.$$

and

$$Z_1(s) = 10^5$$

$$\therefore T_{V2}(s) = \frac{-Z_2}{Z_1} = \frac{-100}{s+100}$$

Using the Chain rule:

$$T_V(s) = T_{V1}(s)\cdot T_{V2}(s) = \left(\frac{-1000}{s+1000}\right)\cdot\left(\frac{-100}{s+100}\right)$$

$$\boxed{T_V(s) = \frac{10^5}{(s+100)\,|\,(s+1000)}}$$

$\Rightarrow$ $T_V(s)$ has poles at $s=-100$ and $s=-1000$ and a double zero at infinity.