M . Mythri Varshitha
EE19BTECH11014

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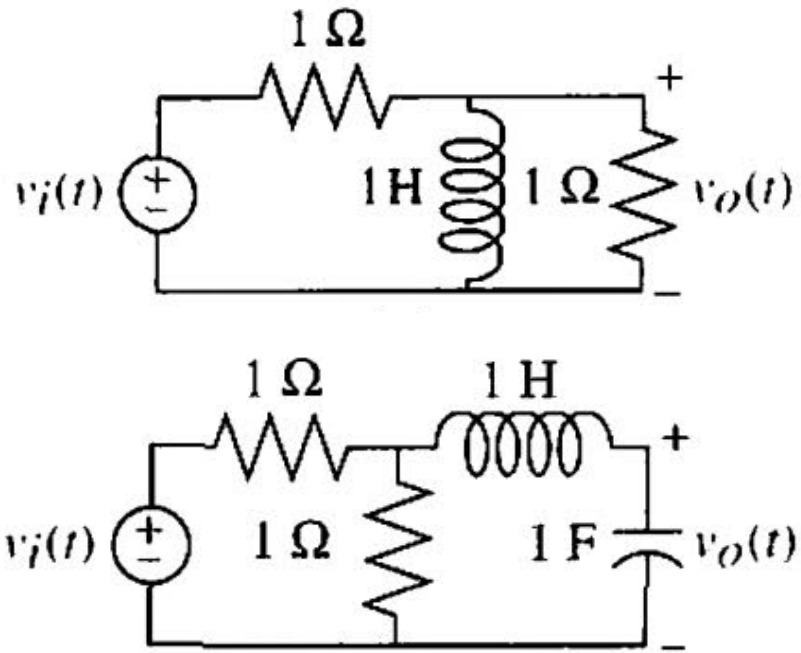
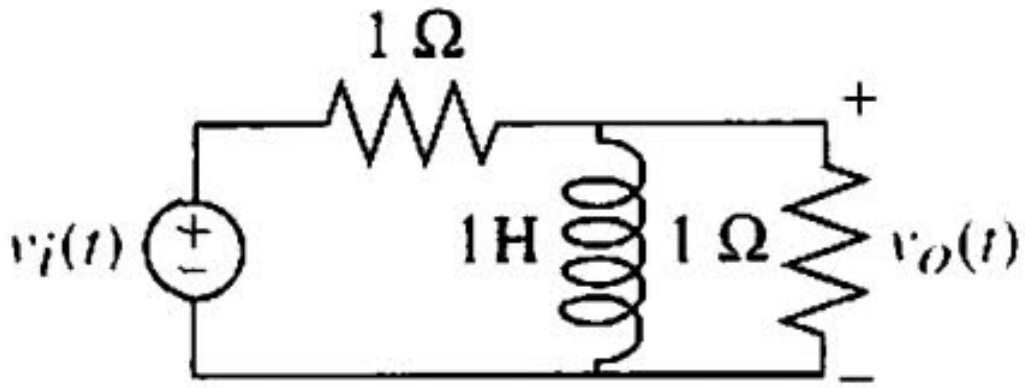
QUESTION

Find the transfer function, $G(s)=\frac{V_o(s)}{V_i(s)}$ for the networks given.



NETWORK 1



Writing equations of both loops in the circuit

$$V_i(t) = R + L\frac{di}{dt}$$

$$V_o(t) = L\frac{di}{dt}$$

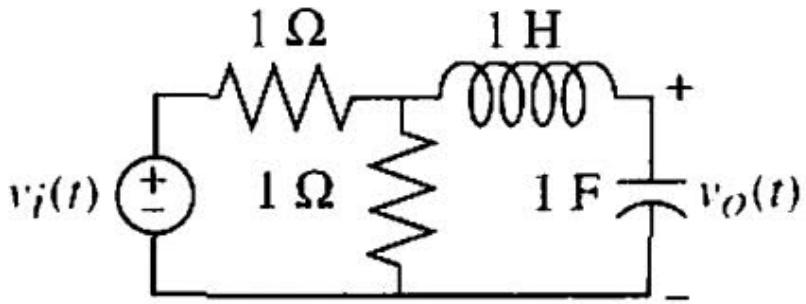
Applying laplace tranform on both equations

$$V_i(s) = i(s) + si(s)$$

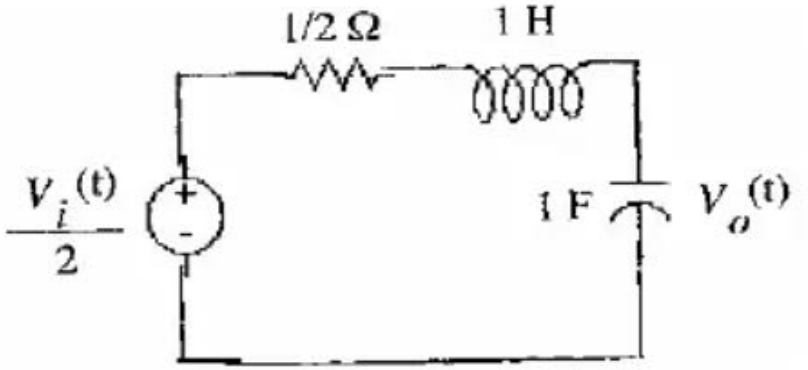
$$V_0(s) = si(s)$$

With this we get Tranfer Function G(s)$=\frac{V_o(s)}{V_i(s)} = \frac{s}{1+s}$

NETWORK 2



Thevinizing the circuit ,



By voltage division rule,

$$V_o(s) = \frac{V_i(s)}{2} \frac{1/s}{1/s + s + 1/2}$$

And hence
Transfer Function G(s)$=\frac{V_o(s)}{V_i(s)} = \frac{1}{2s^2+s+2}$

THANKYOU