

Find solutions for your homework

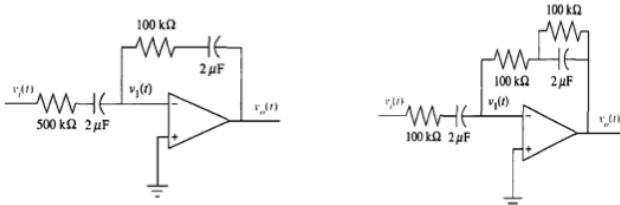
Search

home / study / engineering / electrical engineering / electrical engineering questions and answers / 4. (p2.21) find transfer function, $g(s) = v_0(s)/v_i(s)$...

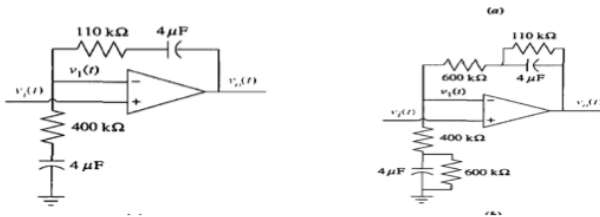
Question: 4. (P2.21) Find transfer function, $G(s) = V_0(s)/V_i(s)$, fo...

(13 bookmarks)

4. (P2.21) Find transfer function, $G(s) = V_0(s)/V_i(s)$, for each operational amplifier circuit shown below.



5. (P2.22) Find the transfer function, $G(s) = V_0(s)/V_i(s)$, for each operational amplifier circuit shown below.



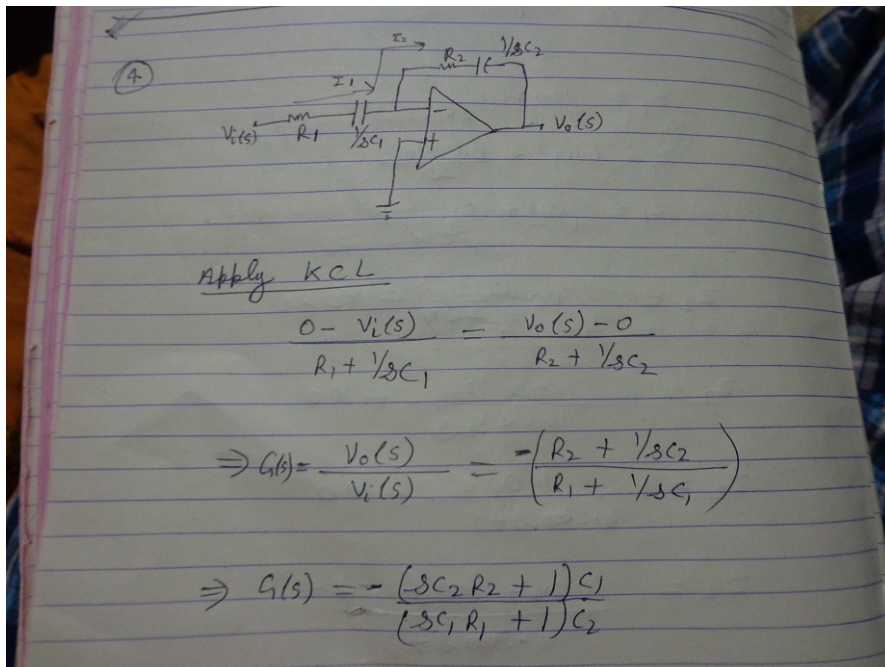
Show transcribed image text

View comments (7) >

Expert Answer

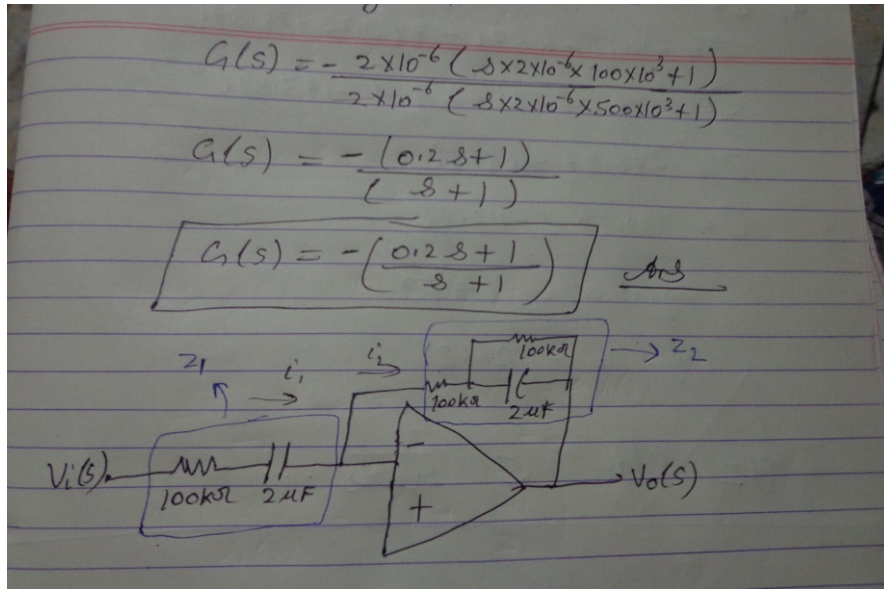
trainer answered this
1,472 answers

Was this answer helpful?



Snap a photo from your phone to post a question
We'll send you a one-time download link

By providing your phone number, you agree to receive a one-time automated text message with a link to get the app. Standard messaging rates may apply.



Handwritten derivation of the impedances Z_1 and Z_2 for the circuit:

$$Z_1 = 100 \times 10^3 + \frac{1}{2 \times 10^{-6} s}$$

$$Z_1 = 0.1 \times 10^6 + \frac{0.5 \times 10^6}{s}$$

$$Z_1 = \left(0.1 + \frac{0.5}{s} \right) 10^6$$

$$Z_2 = \left(100 \times 10^3 \parallel \frac{1}{2 \times 10^{-6} s} \right) + 100 \times 10^3$$

$$Z_2 = \frac{100 \times 10^3 \times \frac{1}{2s}}{100 + \frac{1}{2s}} + 100$$

$$Z_2 = \frac{100 \times 10^3}{0.2s + 1} + 100$$

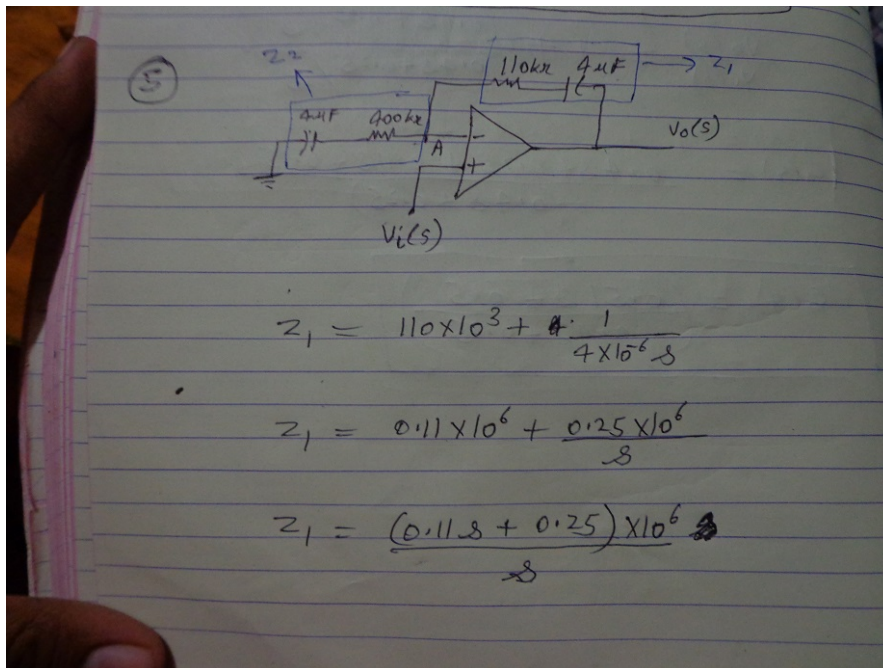
$$Z_2 = \frac{100 \times 10^3 + 100 (0.2s + 1)}{0.2s + 1}$$

$$Z_2 = \frac{20s + 100/0.001}{0.2s + 1}$$

apply KCL in ckt

$$\frac{V_0(s)}{V_i(s)} = - \frac{Z_2}{Z_1}$$

$$\Rightarrow \frac{V_0(s)}{V_i(s)} = - \frac{(20s + 100)/(0.2s + 1)}{(0.1s + 0.5)10^6/s}$$



$$Z_2 = 0.4 \times 10^6 + \frac{0.25 \times 10^6}{s}$$

$$Z_2 = \frac{(0.4s + 0.25) 10^6}{s}$$

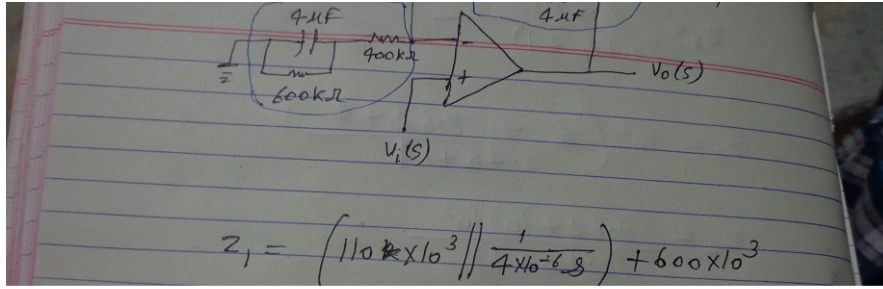
apply kcl at node A

$$\frac{V_0(s)}{V_i(s)} = 1 + \frac{(0.118 + 0.25)/s}{(0.4s + 0.25)/s}$$

$$G(s) = \frac{0.4s + 0.25 + 0.118 + 0.25}{(0.4s + 0.25)}$$

$$G(s) = \frac{0.518s + 0.5}{0.4s + 0.25}$$

≡ **Chegg Study** Textbook Solutions Expert Q&A Practice



$$Z_1 = \frac{110 \times 10^3}{0.44s + 1} + 600 \times 10^3$$

$$Z_1 = 10^3 \left(\frac{110}{0.44s + 1} + 600 \right)$$

[View comments \(1\) >](#)

COMPANY 

LEGAL & POLICIES 

CHEGG PRODUCTS AND SERVICES 



© 2003-2021 Chegg Inc. All rights reserved.