UNIVERSITY OF CALIFORNIA
College of Engineering
Department of Electrical Engineering
and Computer Sciences

	Midterm	**EECS 247**
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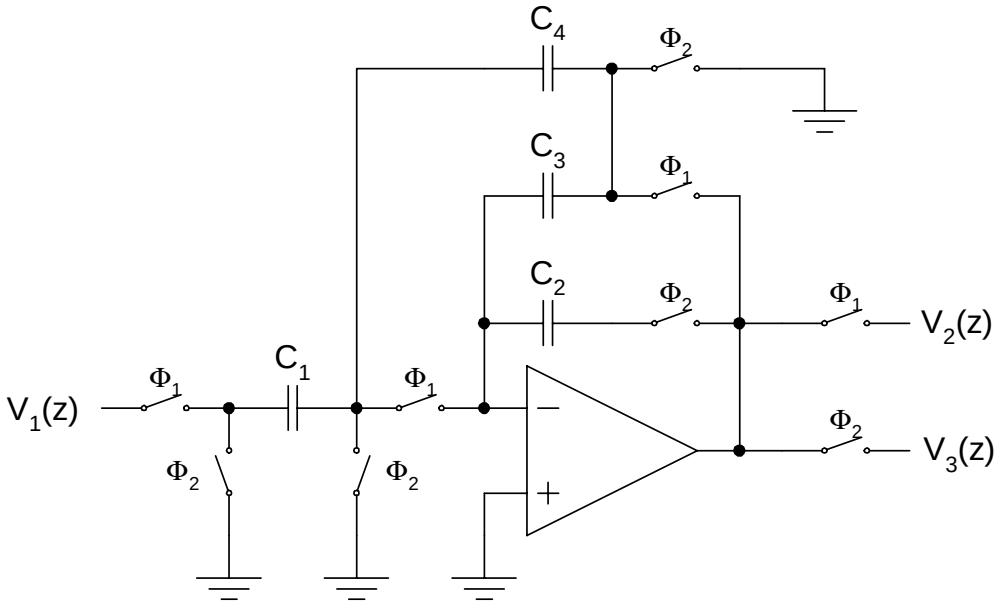
1. Find the following transfer functions (the amplifier is ideal):
   a) $H_1(z)=V_2(z) / V_1(z)$, during phase 1, and
   b) $H_2(z)=V_3(z) / V_1(z)$, for phase 1 input and phase 2 output.

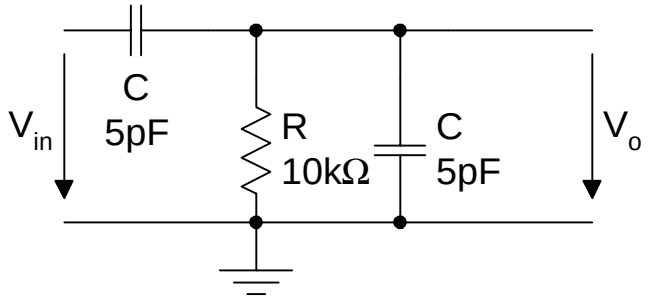


2. The transfer function H(s) is realized as a switched capacitor ladder filter with LDI integrators.

$$H(s) = \frac{0.0010005\,(s^2 + 1.235)\,(s^2 + 1.438)\,(s^2 + 2.408)\,(s^2 + 15.34)}{(s^2+0.4952s+0.1505)(s^2+0.28s+0.5605)(s^2+0.1106s+0.8742)(s^2+0.0272s+0.9987)}$$

a) Find the minimum clock frequency for the SC filter that is required to keep all zeros in the response.
b) What type of filter is H(s) realizing (low pass, band pass, etc)?

3. The output V_o of the filter shown below is processed by an ideal sampler operating at f_s=1MHz (e.g. an ideal A/D converter). V_{in} is a sinusoid with 1V amplitude and f_x=1.3MHz. Calculate the amplitude and frequency of the sampled output.



4. Find the transfer function $H(z)=V_2(z)/V_1(z)$ of the following SC circuit (for Φ_1):