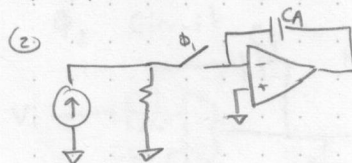
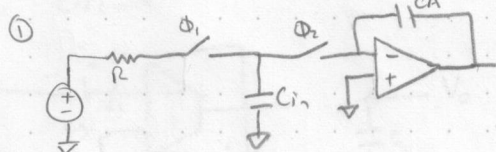


2) b) WEB of sine prefilter 3.4x smaller than voltage sampling designed for 0.1% settling in  $DT_s$

error @  $t = nT_s = 0.1\%$

$n = -\ln(0.1\%) = 6.90$



$$ENBW_1 = \frac{KT}{C} \cdot \frac{1}{4kTn} = \frac{1}{4RC}$$

$$DT_s = n \cdot T_s = n \cdot R \cdot C \quad RC = \frac{DT_s}{n}$$

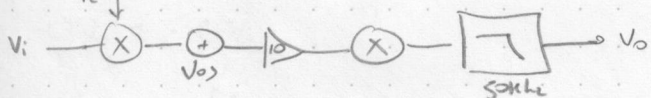
$$ENBW_1 = \frac{n}{4DT_s} =$$

(2) Boxcar sampler -  $ENBW_2 = \frac{f_s}{2} = \frac{1}{2DT_s}$

$$\frac{ENBW_1}{ENBW_2} = \frac{\frac{n}{4DT_s}}{\frac{1}{2DT_s}} = \frac{n}{2} = 3.45$$

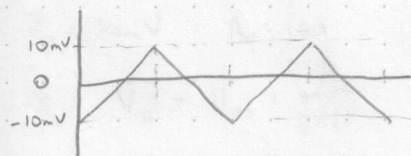
3)  $A=10$   $BW \rightarrow$   $Z_{in} = \infty$   $Z_{out} = 0$   $V_{os} = 20mV$   $f_c = 1MHz$   $f_{LFF} = 50kHz$

$f_c = 20 \cdot f_{LFF}$  on period of  $\frac{1}{2}T_c$ , step response looks like triangle wave



a)  $V_i = 0$ , plot  $V_o$

$V_{os} \cdot 10 = 200mV$  @  $1MHz$ , 1 pole - gain =  $\frac{1}{\sqrt{1 + \frac{1MHz^2}{50kHz^2}}} = 0.05$   
 $V_p = V_{os} \cdot 10 \cdot 0.05 = 0.1V$



b)  $V_{pp} = 2 \cdot V_p$   $V_p = 10mV$   $V_{pp} = 20mV$