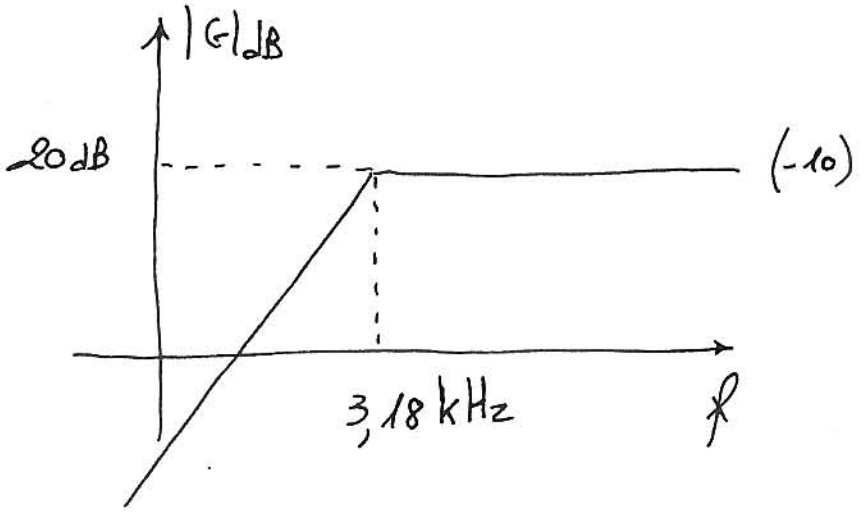
es1

a) $$G = -\frac{Z_2}{Z_1} = -\frac{sC_1R_2}{1+sC_1R_1}$$



PASSA ALTO

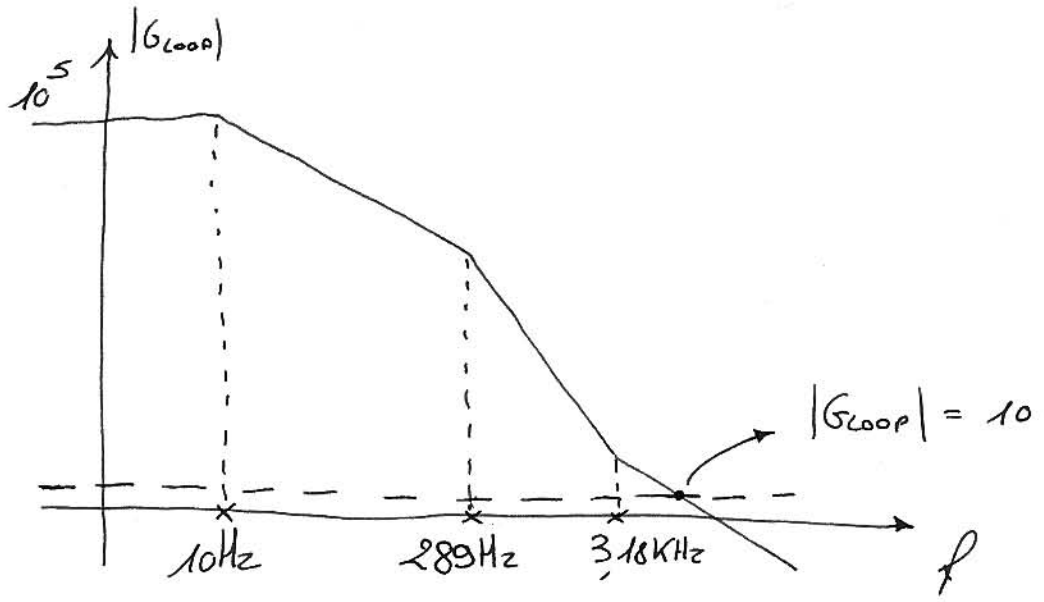
b) $$Z_{IN} = \frac{1+sC_1R_1}{sC_1}$$

c) $V_{OUT,\,offset} = 2mV$

$V_{OUT,\,I_{BIAS}} = 5mV$ (supponendo correnti entranti)

d) $$G_{LOOP} = -\frac{10^5}{1+s\tau_{op}} \cdot \frac{1+sC_1R_1}{1+sC_1(R_1+R_2)}$$

$$\frac{1}{2\pi\tau_{op}} = 10Hz$$

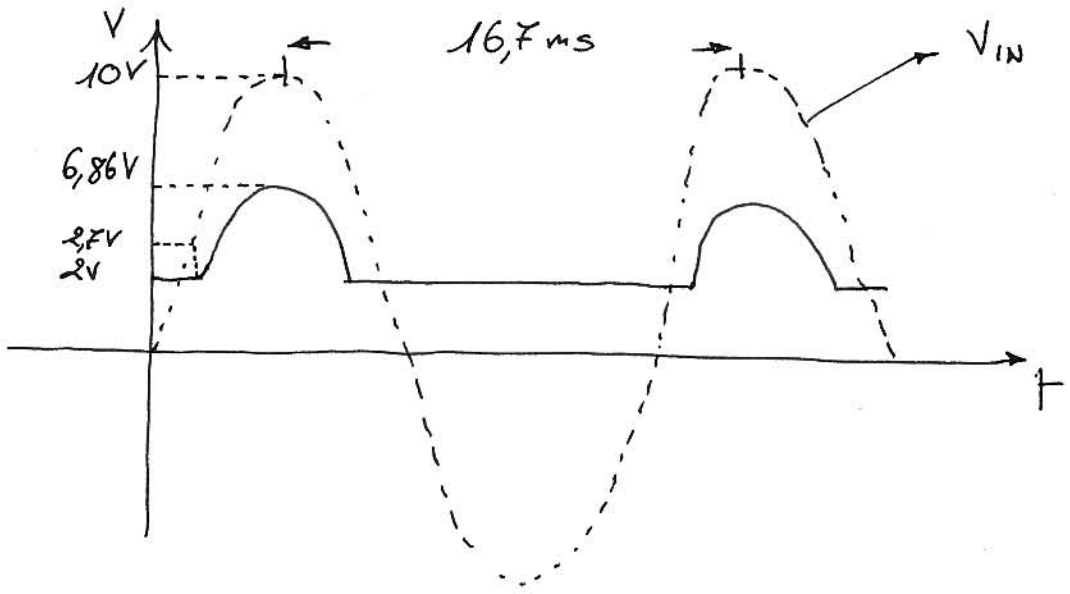


e) $f_{MAX} \simeq 9,1\ kHz$

---

es 2

1)



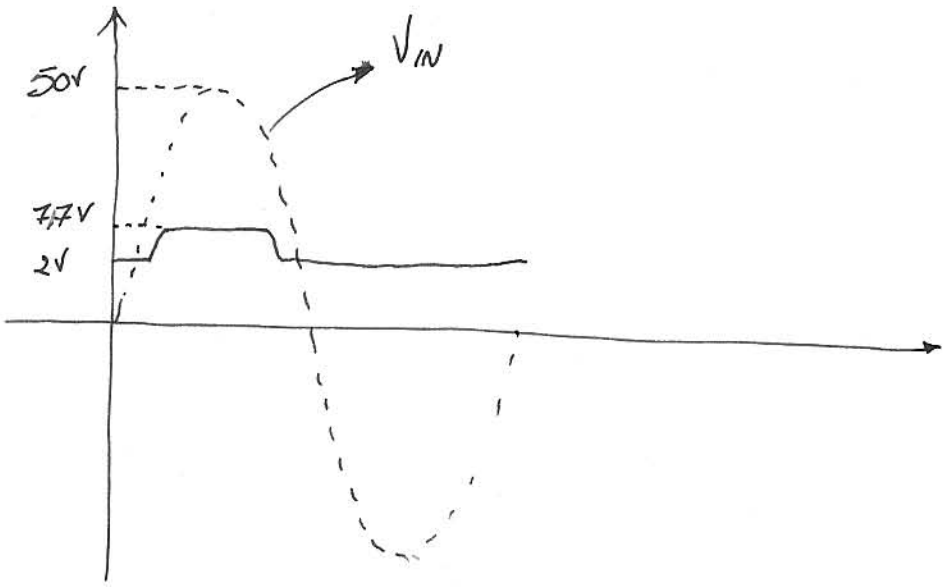
D_1 OFF $\rightarrow$ $V_{OUT} = 2V$

D_1 ON $\rightarrow$ $V_{OUT} = 2V + \frac{2}{3}(V_{IN} - 2,7) = \frac{2}{3}V_{IN} + 0,2V$

D_2 sempre OFF

es

2)



Per $V_{IN} > 11,25V$ D2 ON e $V_{OUT} = 7,7V$

es 3

1) $V_G = -1V$
$V_S = -2V$
$V_D = 1V = V_{OUT}$
$I_D = 1mA$
MOS IN saturazione

2) $G = \frac{V_{out}}{V_{IN}} = -2$

3) $G = \frac{V_{out}}{V_{IN}} = -1$

4) → IL MOS va in zona ohmica
$V_{IN,MAX} = +1V$

es 4

A	B	C
1	0	1
1	1	0
0	1	0
0	0	0