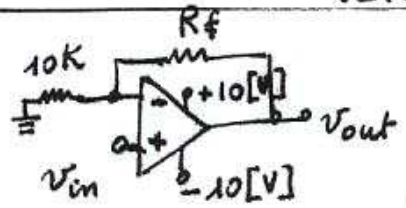
IV C INF 20/01/2007 ELETTRONICA

VERIFICA SU A. OPERAZIONALE FILA 1

1)



a) Quanto deve valere R_f perché v_{out} sia $= 6\, v_{in}$?

b) Qual è il max valore di v_{in}, in zona lineare ?

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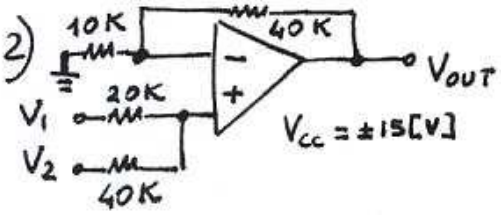
2)



a) determina V_{OUT} (in forma letterale)

b) poni $V_1 = 0,5$ [V] d.c.

$v_2(t) = 600 \sin(2\pi 100 t)$ [mV]

e determina $v_{out}(t)$.

c) disegna le 2 v_{in}, le 2 v_{out} parziali, la v_{out} totale

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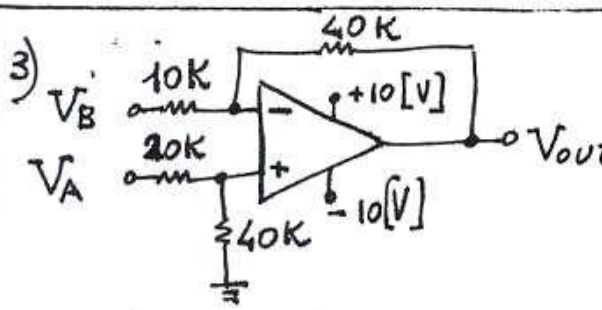
3)



a) determina V_{OUT}

b) modifica la R in modo da ottenere $V_{OUT} = 6(V_A - V_B)$

c) quanto vale V_{OUT} se, essendo nel caso b), $(V_A - V_B) = 2$ [V] ?

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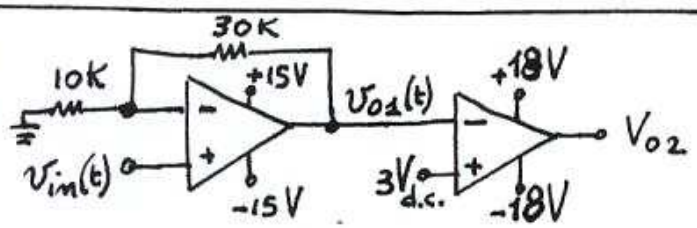
4)



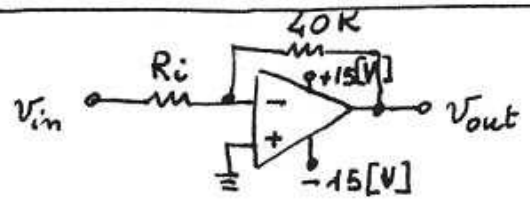
$v_{in}(t) = 2 \sin(2\pi 1000 t)$ [V]

determina e disegna $v_{o1}(t)$ e V_{o2}.

IV C INF 20/01/07 ELETTRONICA

VERIFICA SU A. OPERAZIONALE FILA 2

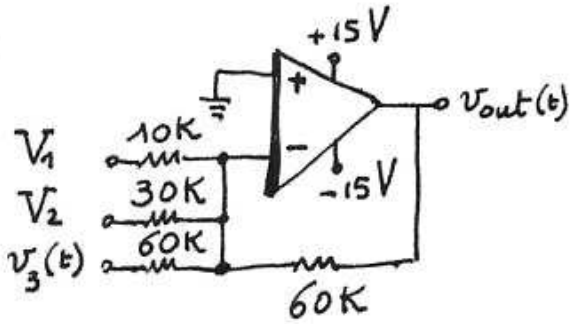
1)



a) Quanto deve valere R_i perché v_{out} sia $= -5\, v_{in}$?

b) Qual è il max valore di v_{in} in ZONA LINEARE ?

2)



a) determina v_{out} (in forma letterale)

b) poni $V_1 = 0{,}5$ [V] d.c.

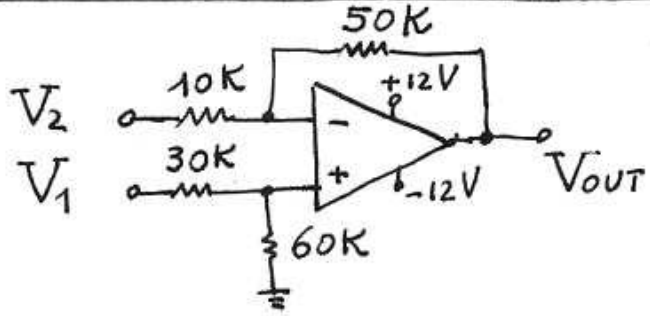
$V_2 = -1$ [V] d.c.

$v_3(t) = 5 \sin(2\pi 500 t)$ [V]

e determina $v_{out}(t)$

c) disegna le 3 v_{in}, le 3 v_{out} parziali, la v_{out} totale.

3)

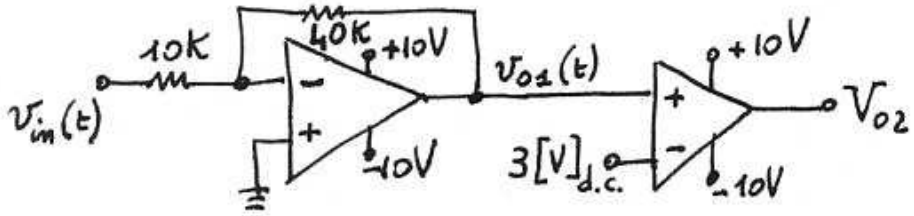


a) determina V_{OUT}

b) modifica le R in modo da avere $V_{OUT} = 5(V_1 - V_2)$

c) Quanto vale V_{OUT} se, essendo nel caso b), $(V_1 - V_2) = 3$[V] ?

4)



$v_{in}(t) = 1{,}5 \sin(2\pi 100 t)$ [V]

determina e disegna $v_{o1}(t)$ e V_{o2}.

IV CINF | 4ª VERIFICA (SU A.O.) - SOLUZIONE | FILA 1

1) (A. NON INVERTENTE)

a) $R_f = (6-1)\,R_{IN} = \boxed{50\,[K\Omega]}$

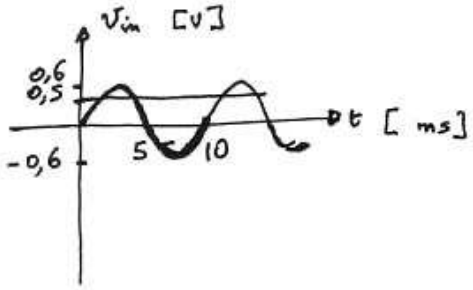
b) $|V_{INMAX}| \simeq \frac{8}{6} \cong \boxed{1{,}3\ [V]}$

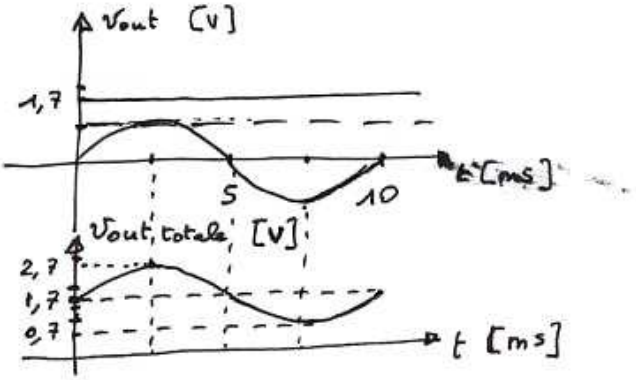
2) (SOMMATORE NON INVERTENTE)

a) $V_{OUT} = V_1 \frac{40}{30}\left(1+\frac{40}{10}\right) + V_2 \frac{20}{60}\left(1+\frac{40}{10}\right) = \boxed{\frac{10}{3}V_1 + \frac{5}{3}V_2}$

b) $v_{OUT}(t) = 0{,}5\cdot\frac{10}{3} + 0{,}6\cdot\frac{5}{3}\sin(2\pi 100t)\ \ [V] \cong \boxed{1{,}7 + 1\cdot\sin(\pi 100t)\ [V]}$

c)

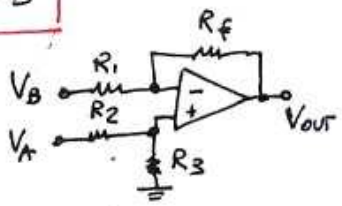




3) (DIFFERENZIALE)

a) $V_{OUT} = V_A \frac{40}{30}\left(1+\frac{40}{10}\right) - V_B\frac{40}{10} = \boxed{\frac{10}{3}V_A - 4V_B}$

b) es: $R_1 = R_2 = 10\ [K\Omega]$ $\quad R_f = R_3 = 60\ [K\Omega]$



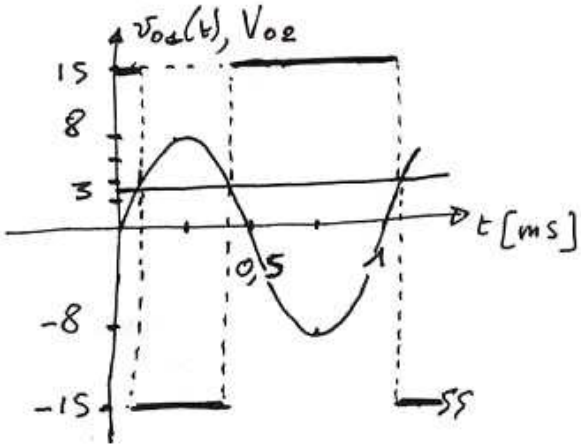
c) $V_{OUT} \cong 8\ [V]$

4) (AMPLI NON INVERTENTE + COMPARATORE INVERTENTE)

$v_{o1}(t) = 2\cdot\left(1+\frac{30}{10}\right)\sin(2\pi 1000t) = 8\sin(2\pi 1000t)$

$V_{o2} \cong 15\ [V]$ se $v_{o1} < 3\ [V]$

$V_{o2} \cong -15$ " " " > "



IV C_IN – 4ª VERIFICA (SU A.O.) – SOLUZIONE F.2

1) a) (ampli invertente di tensione) $\frac{v_{out}}{v_{in}} \triangleq A_f = -\frac{R_f}{R_i} = -5 = -\frac{40}{R_i} \Rightarrow \boxed{R_i = 8\,[K\Omega]}$

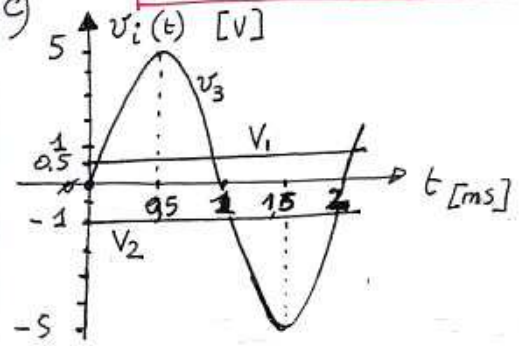
b) $|V_{in\,max}| = \frac{|V_{SAT}|}{|A_f|} \cong \frac{12}{5} \cong \boxed{2{,}4\,[V]}$

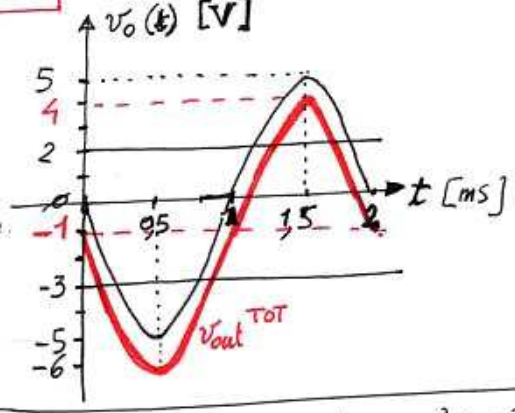
2) a) (Sommatore invertente) $v_{out} = V_1\left(-\frac{60}{10}\right) + V_2\left(-\frac{60}{30}\right) + v_3(t)\left(-\frac{60}{60}\right)$

b) $v_{out} = 0{,}5\cdot(-6) - 1\,(-2) + 5\sin(2\pi 500t)(-1) = -3 + 2 - 5\sin(2\pi 500t) =$

$\boxed{= -1 - 5\sin(2\pi 500t)}$ [V]

c)



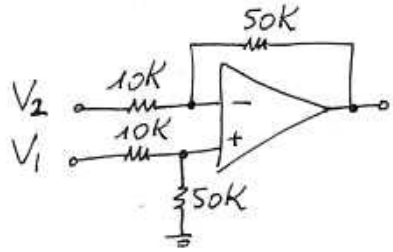


$\begin{cases} V_{o1} = -3\,[V] \text{ d.c.} \\ V_{o2} = +2 \;\; " \;\; " \\ v_{o3} = -5\sin(2\pi 500t)\,[V] \end{cases}$

$T = \frac{1}{f} = \frac{1}{500} = 2\,[ms]$

3) a) (DIFFERENZIALE) $v_{out} = V_1 \cdot \frac{60}{30+60}\left(1 + \frac{50}{10}\right) - V_2\left(\frac{50}{10}\right) = V_1 \frac{2}{3}\left(\frac{2}{3}\right) - 5V_2 = \boxed{\frac{4}{9}V_1 - 5V_2}$

b)



c) V_{OUT} dovrebbe valere $5 \cdot 3 = 15\,[V]$ ma essendo $+V_{SAT} \cong +10\,[V]$, questo sarà il valore assunto dall'uscita.

4) (A. invertente + Comparatore non invertente)

$v_{o1}(t) = 1{,}5\sin(2\pi 100t)\cdot\left(-\frac{40}{10}\right) = -6\sin(2\pi 100t)\,[V]$

$\begin{cases} V_{o2} \cong +8\,[V] \text{ se } v_{o1} > 3\,[V] \\ V_{o2} \cong -8 \;\; " \;\; \text{se} \;\; v_{o1} < 3 \;\; " \end{cases}$

$T = \frac{1}{f} = \frac{1}{100} = 10\,[ms]$