Risoluzione 060420

1. $V1 = \frac{Vcc\,R2 - Vcc\,R1}{R1 + R2} = -2.V$

2. $Icn[k+1] = \frac{V1 + Vcc - VT \setminus Log[\frac{Icn[k]}{IS}]}{R3}$

$\rightarrow Icn = 229\mu A$

3. $Iep = \frac{Vcc}{R5} = 2.5mA;\ Ibp = 100\mu A$

4. $V2 = -VT\ Log[\frac{Icp}{IS}] = -770mV$

5. $R4 = \frac{Vcc - V2}{Icn - Ibp} = 44.6k\Omega$

6. $gmn = \frac{Icn}{VT} = 8.5mA/V$

7. $gmp = \frac{Icp}{VT} = 88.9mA/V;\quad rbep = \frac{BF}{gmp} = 270\Omega$

8. $Rinp = rbep + (BF+1)R5 = 50.3k\Omega$

9. $Avp = \frac{(BF + 1)\ R5}{Rinp} = 0.995$

10. $Avn = -\frac{gmn\ \frac{R4\ Rinp}{R4+Rinp}}{1 + gmn\ R3} = -2.34$

11. $Av = Avp\ Avn\ \frac{\frac{R1\ R2}{R1+R2}\ s\ Ca}{1 + \frac{R1\ R2}{R1+R2}\ s\ Ca} = -\frac{(2.44\times10^{-4})\ s}{1 + (1.05\times10^{-4})\ s}$

12. $Rout = \frac{rbep + R4}{BF + 1} = 1794.71$

oppure $Rout = \frac{rbep + R4}{BF + 1} || R5 = 945.9$

13. Si tratta di un circuito dinamico del primo ordine e la resistenza differenziale connessa al condensatore $(\frac{R1\ R2}{R1 + R2})$ è >0.