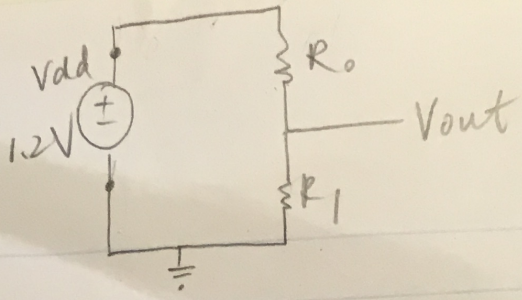
$V_{out} = V_{in} \cdot \frac{R_2}{R_1 + R_2}$



(1)

i. (a) if $R1 \ll R0$, $R1 = 10\Omega$, $R0 = 1k\Omega$

$V_{out} = V_{in} \cdot \frac{R_1}{R_1 + R_0} = 1.2V \cdot \frac{10\Omega}{10\Omega + 1K\Omega} = 1.2 \cdot \frac{10}{1010} = 0.01188V$

$\approx (0)$

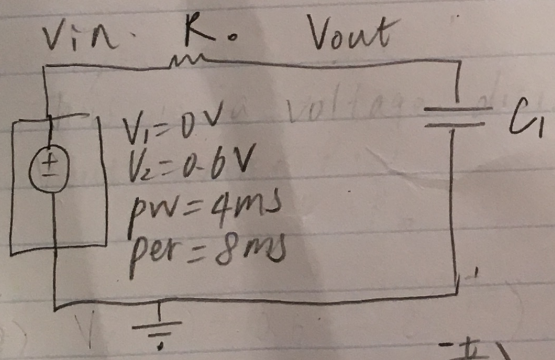
(b) if $R_1 \gg R0$, $R_1 = 10M\Omega$, $R0 = 1K\Omega$

$V_{out} = V_{in} \cdot \frac{R_1}{R_1 + R_0} = 1.2V \cdot \frac{10,000,000\Omega}{10,001,000\Omega} = 1.1988V \ (\approx V_{in})$

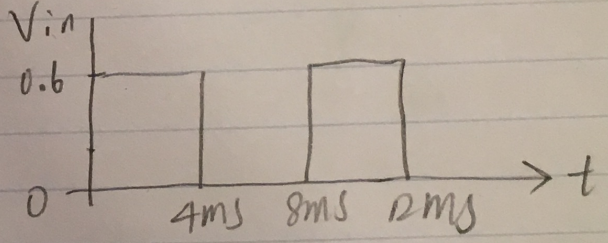
ii (a)

iii (b)

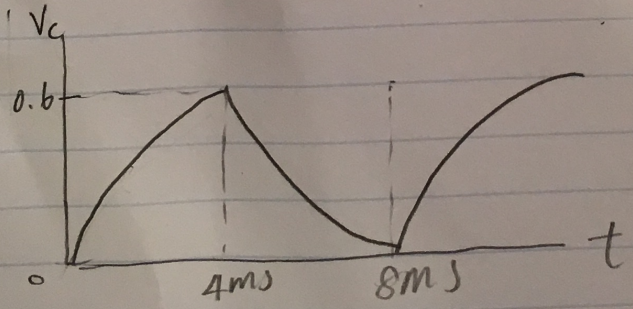
(2)



(a) $V_c(t) = 0.6(1 - e^{-\frac{t}{RC}})$



(b)



(c) final result for $V_c(t)$ is $V_{in} = 0.6V$

(d) $\tau = RC = 1K\Omega \cdot 1\mu F = 0.001s = 1ms$