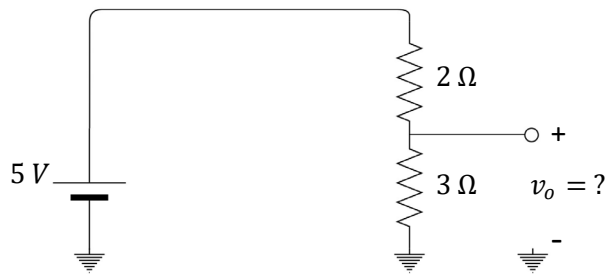


國立陽明交通大學 數位教學中心 開放式課程
(高中生專區) 電子學 小考試題 第一章 (含解答)

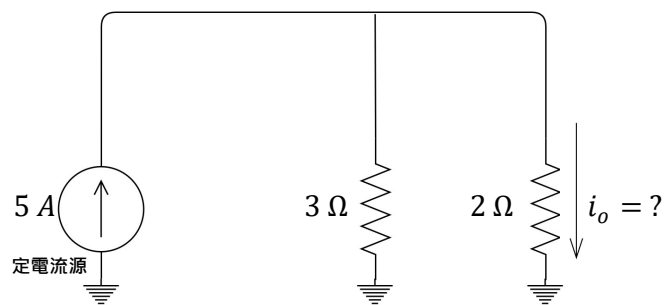
1.1



求 $v_o = ?$

(sol) $v_o = 5 \times \frac{3}{2+3} = 3 V$

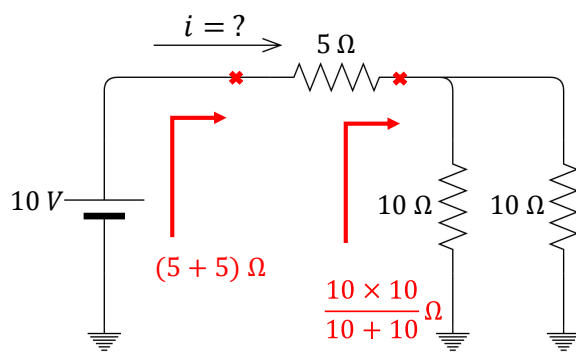
1.2



求 $i_o = ?$

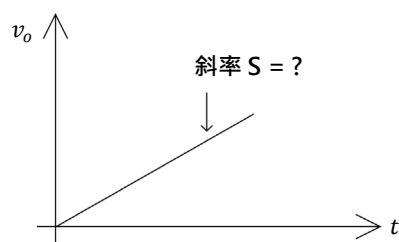
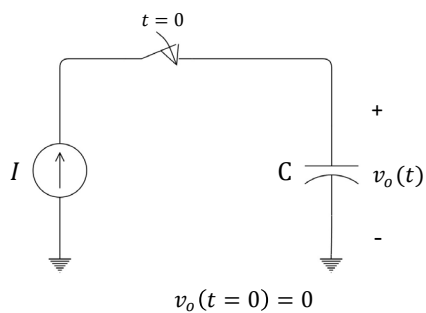
(sol) $i_o = 5 \times \frac{3}{3+2} = 3 A$

1.3



(sol) 等效電阻 $= 10 \Omega$, $i = \frac{10}{10} = 1 A$

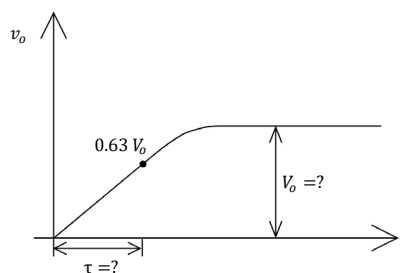
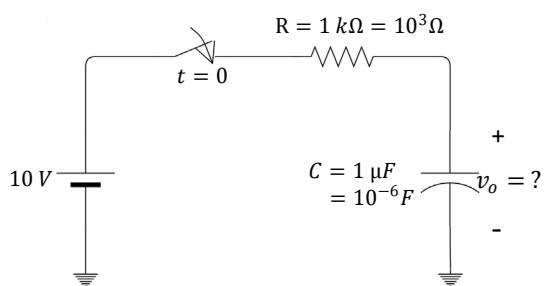
1.4



求斜率 $S = ?$

(sol) $v_o = \frac{1}{C} \int_0^t I dt = \frac{I}{C} t \Rightarrow S = \frac{I}{C}$

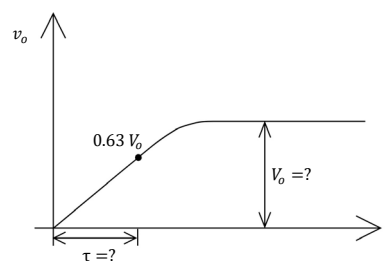
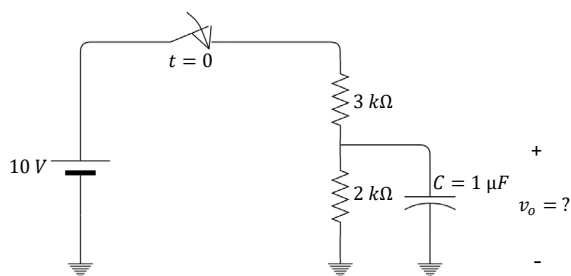
1.5



求 $V_o = ?$ $\tau = ?$

(sol) $V_o = 10 V, \tau = RC = 10^3 \times 10^{-6} = 10^{-3} sec$

1.6



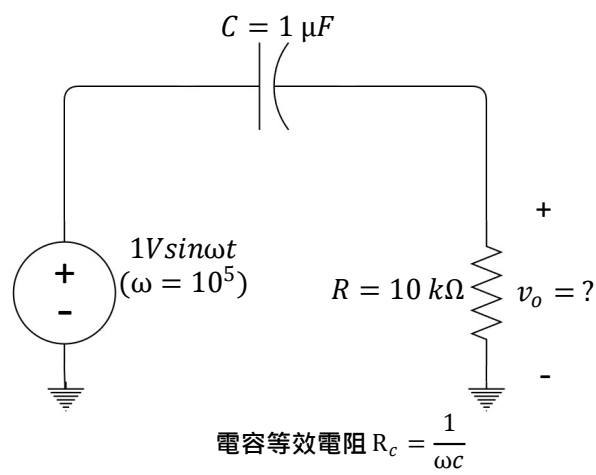
求 $V_o = ?$ $\tau = ?$

(sol)

(a) $V_o = 10 \times \frac{2}{3+2} = 4 V$

(b) $\tau = (3 k\Omega \text{ 並聯 } 2 k\Omega) C = \frac{2 \times 3}{2+3} \times 10^3 \times 10^{-6} = \frac{6}{5} \times 10^{-3} sec$

1.7



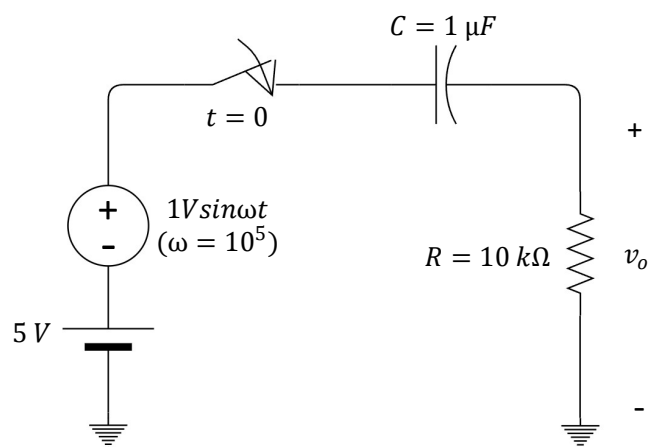
求 $v_o = ?$

(sol)

$$R_c = \frac{1}{\omega C} = \frac{1}{10^5 \times 10^{-6}} = 10 \Omega$$

$$v_o = 1 V \sin \omega t \times \frac{10^4}{10 + 10^4} \cong 1 V \sin \omega t$$

1.8



求一秒之後 $v_o = ?$

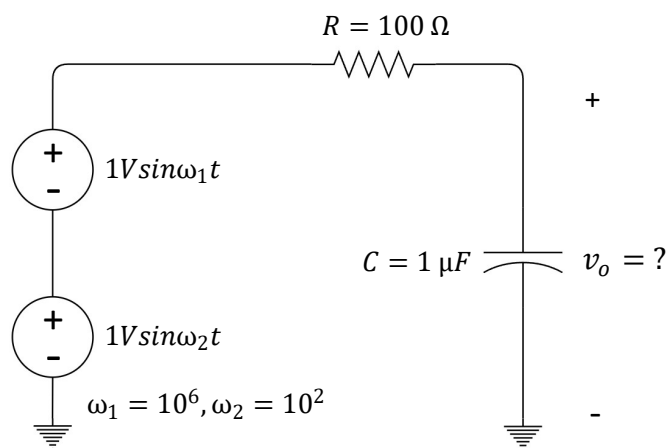
(sol)

$$\tau = RC = 10^4 \times 10^{-6} = 10^{-2} \text{ sec}$$

1 秒 $\gg \tau \Rightarrow C$ 充電至 5 V

$$\Rightarrow v_o = 1 V \sin \omega t \times \frac{10^4}{10 + 10^4} \cong 1 V \sin \omega t$$

1.9



求 $v_o = ?$

(sol)

$$R_c = \frac{1}{\omega C}$$

for $\omega = \omega_1 = 10^6$

$$R_c = \frac{1}{10^6 \times 10^{-6}} = 1 \Omega$$

for $\omega_2 = 10^2$

$$R_c = \frac{1}{10^2 \times 10^{-6}} = 10 \text{ k}\Omega = 10000 \Omega$$

$$v_o = 1 \text{ V sin } \omega_1 t \times \frac{1}{100 + 1} + 1 \text{ V sin } \omega_2 t \times \frac{10000}{10 + 10000} \cong 1 \text{ V sin } \omega_2 t$$