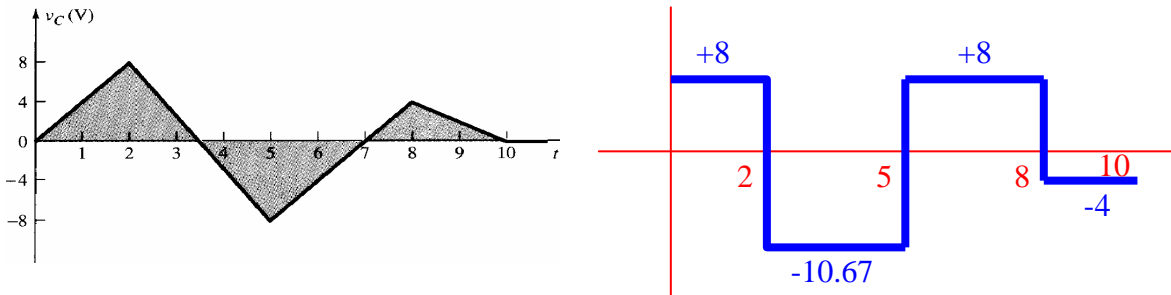


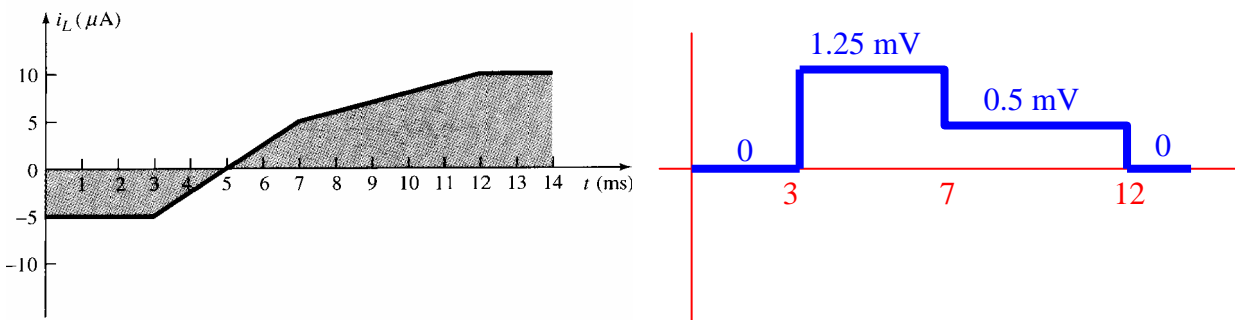
# 生機系電工學第六次隨堂測驗 2011/03/23

學號：\_\_\_\_\_ 姓名：\_\_\_\_\_

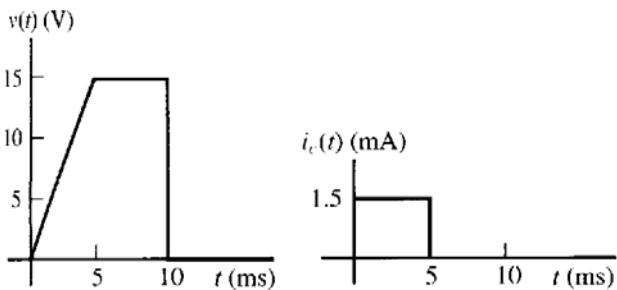
1. Determine the waveform for the current  $i_c$  of a  $2\text{-}\mu\text{F}$  capacitor for the applied-voltage  $v_c$ .



2. Determine the wave form for the  $v_L$  of a  $0.5\text{-H}$  inductor for the current  $i_L$ .



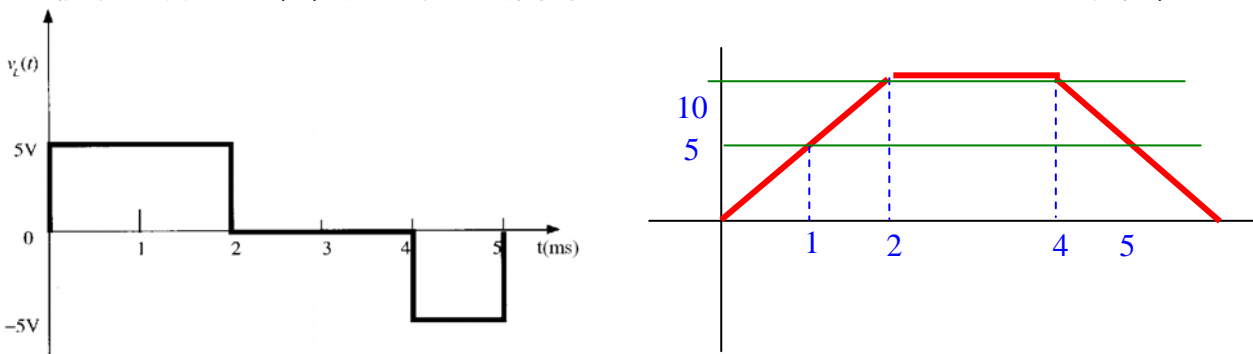
3. 圖示為跨越與流經電容 (capacitor) 之電壓與電流，求該電容之電容值 (capacitance)。8%



$$i_c = C \frac{dV_c}{dt}$$

$$1.5\text{mA} = C \frac{15 - 0\text{V}}{5\text{ms}} = 0.5\mu\text{F}$$

4. 圖示為跨越電感值為  $1\text{-mH}$  之電感 (inductor) 之電壓，畫出流經該電感之電流  $i_L(t)$ 。8% (假設  $i_L(0) = 0\text{ A}$ ) (請明確標示時間為  $1\text{ ms}$ 、 $2\text{ ms}$ 、 $3\text{ ms}$ 、 $4\text{ ms}$ 、 $5\text{ ms}$  之電流值)



$$V_L = L \frac{di_L}{dt}; t=0 \sim 2\text{ms} \quad 5\text{V} = 1\text{mH} \frac{10 - 0\text{A}}{2\text{ms}}; t=2 \sim 4\text{ms} \quad 0\text{V} = 1\text{mH} \frac{10 - 10\text{A}}{2\text{ms}}$$

$$t = 1\text{ms} \quad i_L = 5\text{A} \quad t = 2\text{ms} \quad i_L = 10\text{A} \quad t = 3\text{ms} \quad i_L = 10\text{A} \quad t = 4\text{ms} \quad i_L = 10\text{A} \quad t = 5\text{ms} \quad i_L = 5\text{A}$$