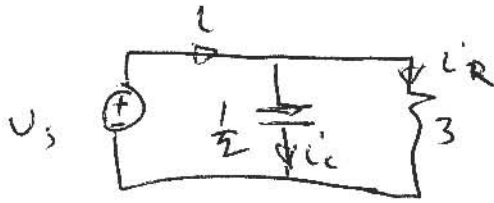


5.1.3



$$U_s(t) = \begin{cases} 0 & , t < -1 \\ t+1 & , -1 \leq t < 0 \\ -t+1 & , 0 \leq t < 2 \\ -1 & , 2 \leq t < 4 \\ t-5 & , 4 \leq t < 5 \\ 0 & , t \geq 5 \end{cases}$$

$$i_R = \frac{U_s}{3} = \begin{cases} 0 & \\ \frac{t+1}{3} & \\ -\frac{t+1}{3} & \\ -1/3 & \\ \frac{t-5}{3} & \\ 0 & \end{cases}$$

for the same intervals given for $U_s(t)$

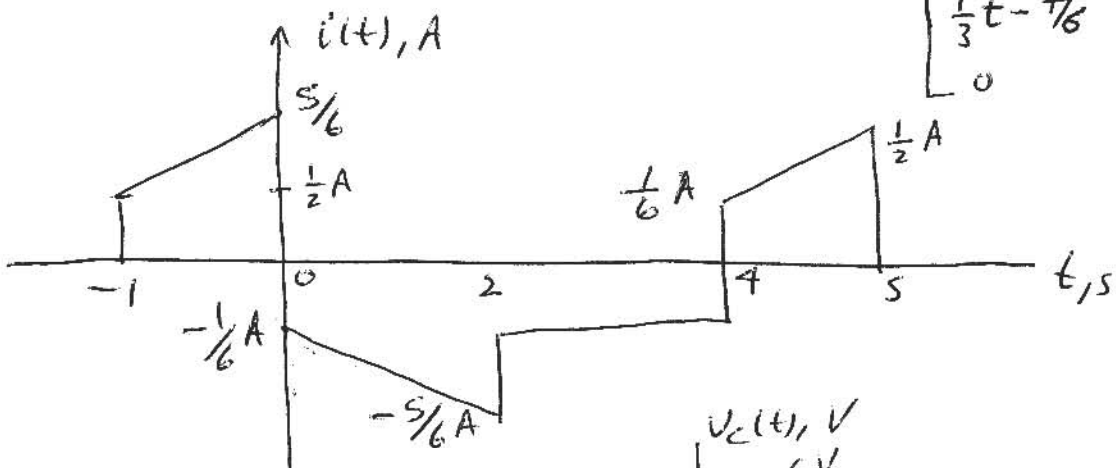
$$i_c = c \frac{dU_s}{dt} = \begin{cases} 0 & \\ 1/2 & \\ -1/2 & \\ 0 & \\ 1/2 & \\ 0 & \end{cases}$$

for the same intervals given for $U_s(t)$

KCL:

$$i = i_R + i_c = \begin{cases} 0 & \\ \frac{1}{3}t + \frac{5}{6} & \\ -\frac{1}{3}t - \frac{1}{6} & \\ -1/3 & \\ \frac{1}{3}t - \frac{7}{6} & \\ 0 & \end{cases}$$

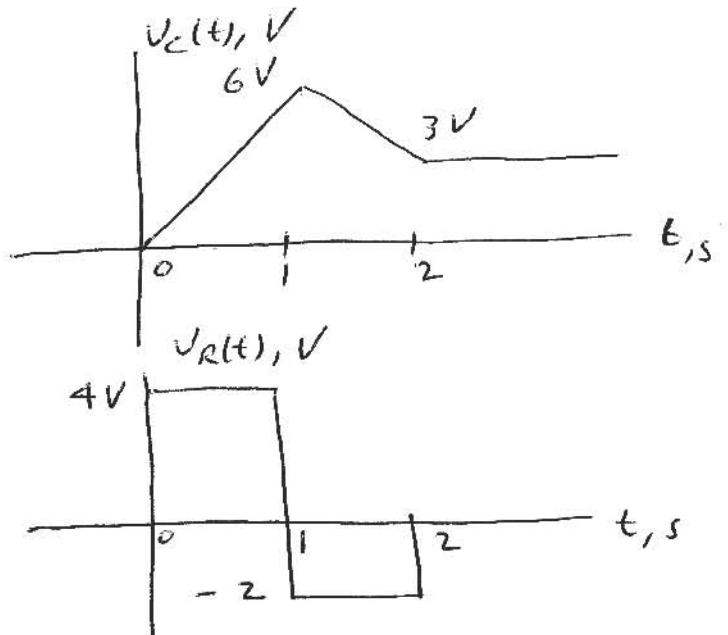
for the same intervals given for $U_s(t)$



5.1.6

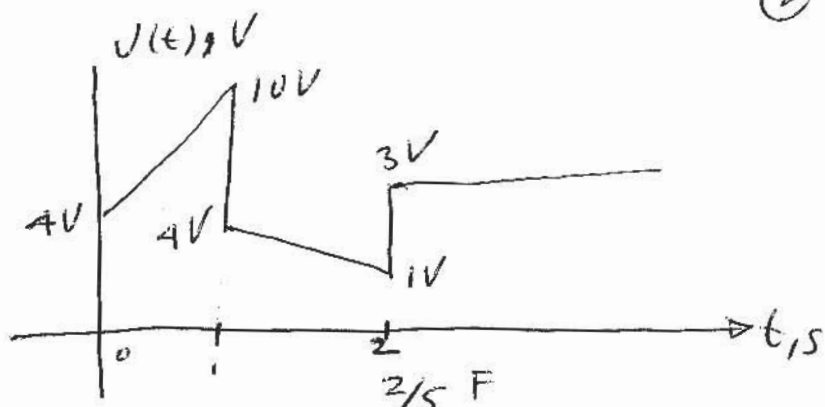
$$U_c = 3 \int_{-\infty}^t i_s(\tau) d\tau$$

$$U_R = 2i_s$$

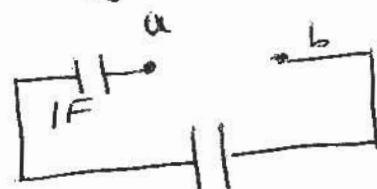
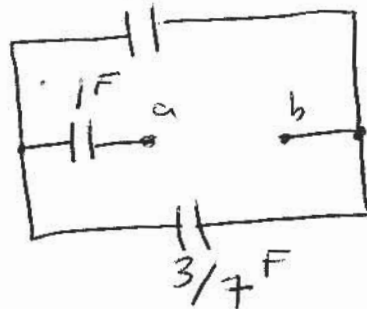
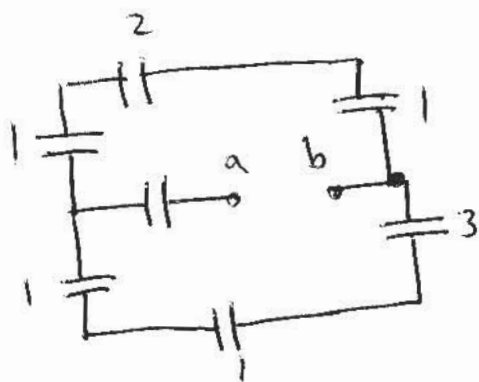


S.1.6 (cont.)

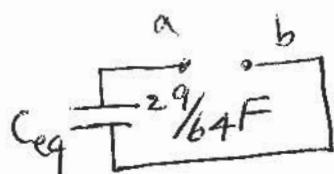
$v(t) = v_R + v_C$



S.1.8



1F in series with $\frac{29}{35} F$



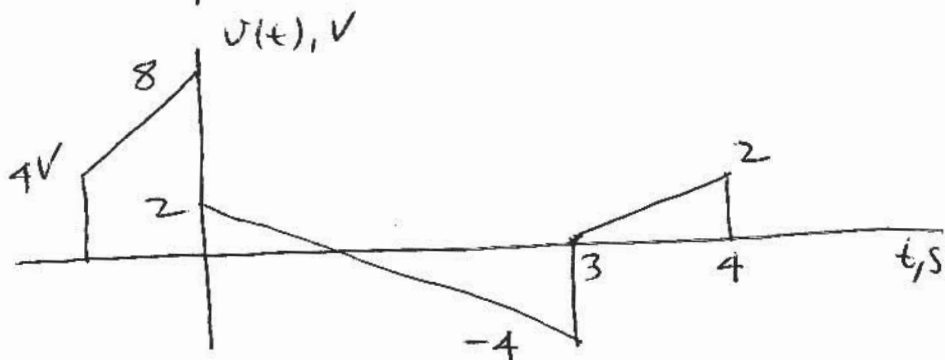
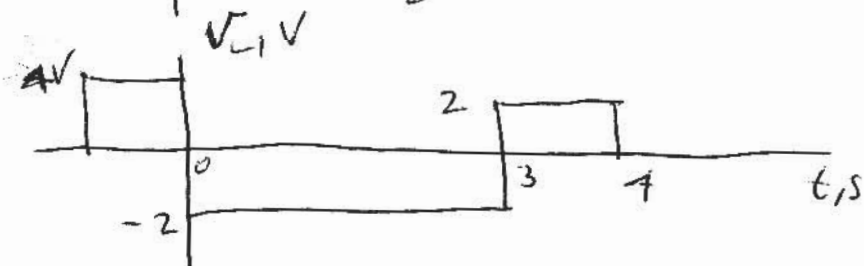
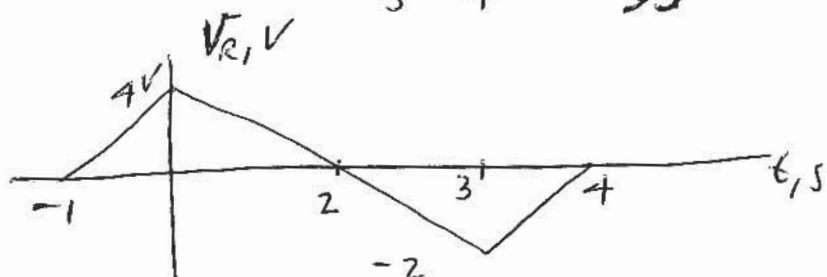
$\frac{2}{5} + \frac{3}{7} = \frac{29}{35} F$

5.2.3

$v_R = 2i_s$

$v_L = 2 \frac{di_s}{dt}$

$v(t) = v_R(t) + v_L(t)$



5.2.6 KCL! $i(t) = i_R + i_C + i_L$ (3)

$$i_R = \frac{V_S}{2}$$

$$i_C = \frac{1}{2} \frac{dv_S}{dt}$$

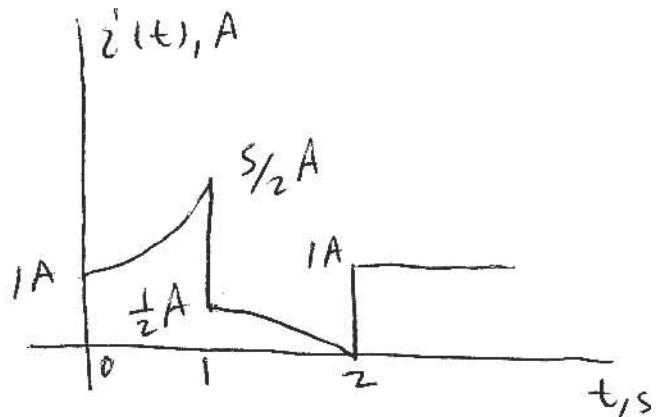
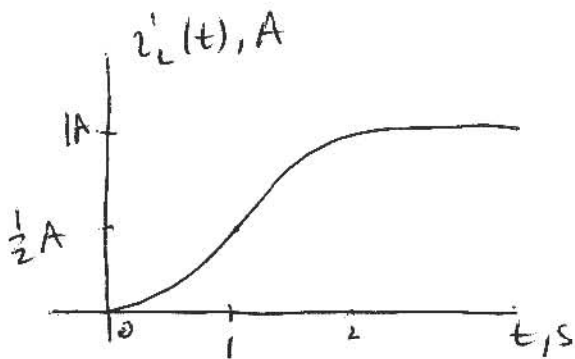
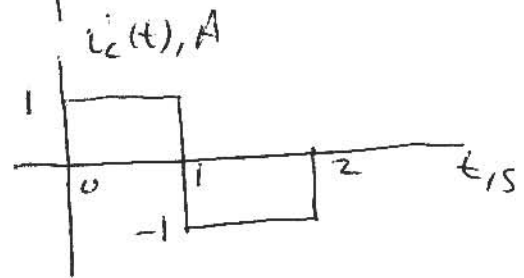
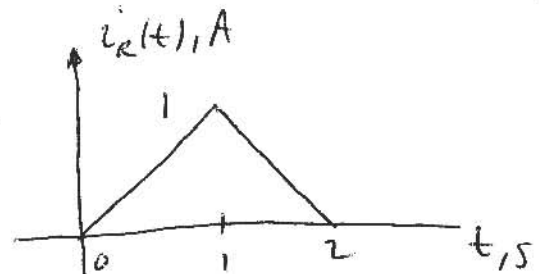
$$i_L = \frac{1}{2} \int_{-\infty}^t v_S(\tau) d\tau$$

for $t < 0$, $i_L(t) = 0$

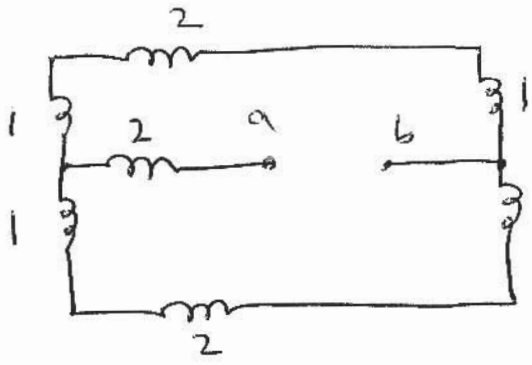
for $0 \leq t < 1$, $i_L(t) = i_L(0) + \frac{1}{2} \int_0^t 2\tau d\tau = \frac{t^2}{2} \Rightarrow i_L(1) = \frac{1}{2}$

for $1 \leq t < 2$, $i_L(t) = i_L(1) + \frac{1}{2} \int_1^t (-2\tau + 4) d\tau = -\frac{t^2}{2} + 2t - 1 \Rightarrow i_L(2) = 1$

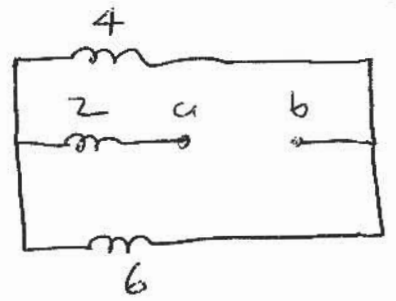
for $t \geq 2$, $i_L(t) = i_L(2) + \int_2^t 0 d\tau = i_L(2) = 1$



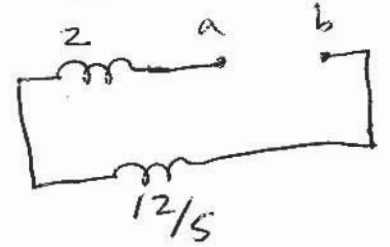
5.2.8



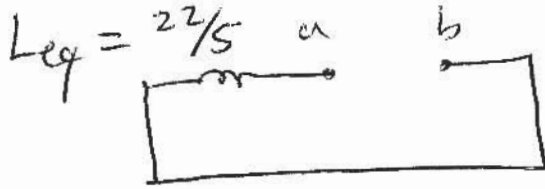
\Rightarrow



\Downarrow

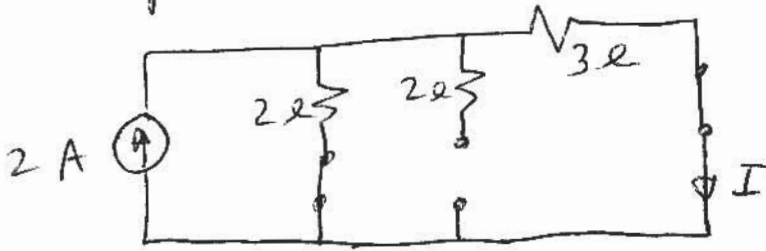


\Leftarrow



5.4-2 Because the circuit is DC:

\Rightarrow Inductors are short circuited
Capacitors are open circuit



$$I = 2 \left(\frac{2}{2+3} \right) = 4/5 \text{ A}$$