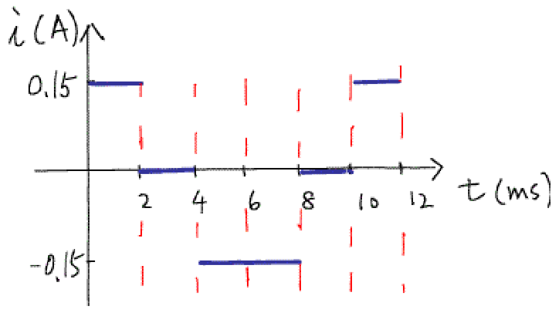
EECS70A / CSE 70A Network Analysis I
Prof. Peter Burke

Homework # 4 solution

Q1. Problem 6.6:

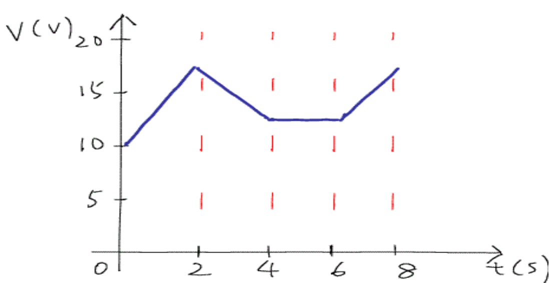
i = C (dV/dt)



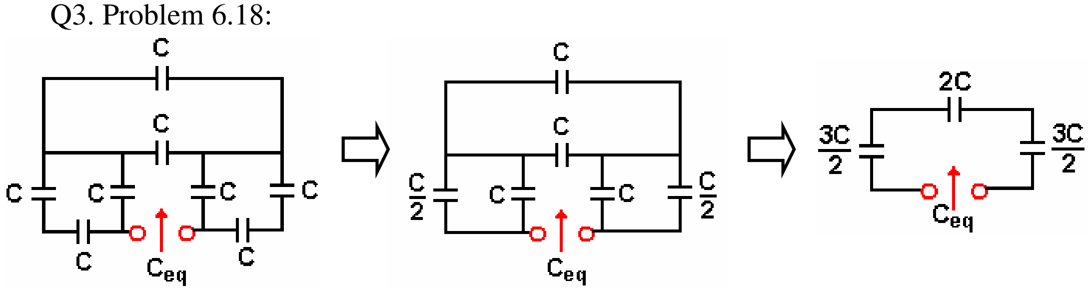
Q2. Problem 6.11:

i = C (dV/dt)

⇒ V= (1 / C) ∫ i(t) dt



Q3. Problem 6.18:



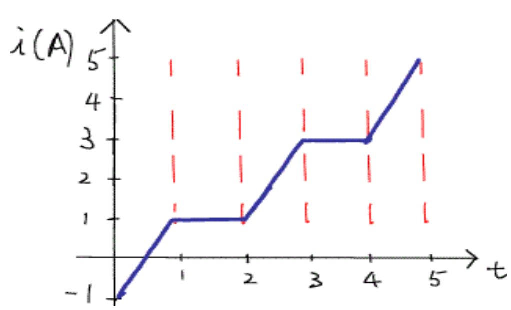
All capacitors are C = 4 μF.

$$\frac{1}{C_{eq}} = \frac{1}{2C} + \frac{2}{3C} + \frac{2}{3C} \Rightarrow \therefore C_{eq} = \frac{6C}{11} = 2.18\ \mu F$$

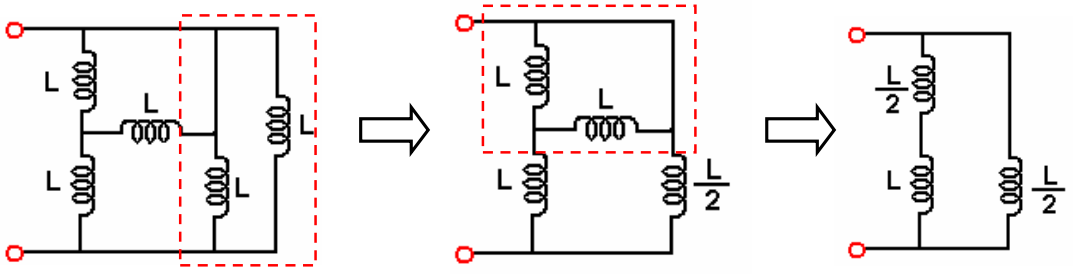
Q4. Problem 6.42:

V = L (di/dt)

⇒ I = (1 / L) ∫ V dt

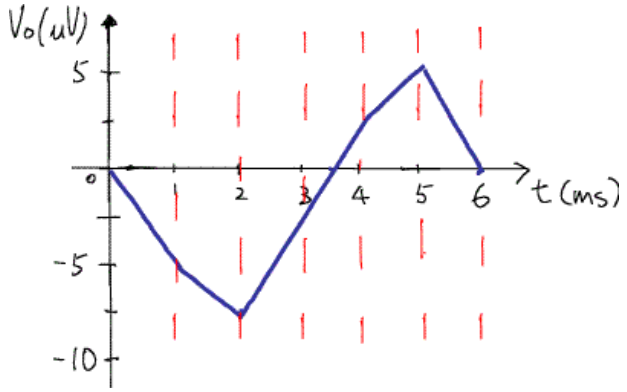


Q5. Problem 6.49:



$\therefore L_{eq} = 3L / 8 = 3.75$ mH

Q6. Problem 6.69:



$V_o(t) - V_o(0)$
$= (-1/RC) \int V_i(t)dt$

Q7. Problem 6.74:

Apply KCL at inverting terminal:

$I = C\, d(V_i - V_-) / dt = -V_o / 20K\Omega$

$\Rightarrow Vo = -(0.01\mu F)(20K\Omega)\, dV_i / dt$

$= -(2\times10^{-4})\, dV_i / dt$