7-3.

(a):

断开前

电路中电流 $I=\frac{30-10}{15+5}=1A$

电容器两端电压 $U_{0-}=1\times5+10=15V$

$i_{0-}=0$

断开后: $U_{0+}=U_{0-}=15V$

电路电压 $U_{0+}'=15V-10V=5V$.

$i_{0+}=\frac{U_{0+}'}{5+25}=\frac{1}{6}A=0.167A$

(b). ~~断开前电路中电流 $I=\frac{30}{30}$~~

开关动作前. 流过电感电流: $i_{0-}=3\times\frac{20}{20+30}=1.2A$

两端电压: $U_{0-}=0$

开关由1拨至2后

电路中电流 $i_{0+}=i_{0-}=1.2A$

$U_{0+}=1.2\times(30+15)=54V$.

7.4.

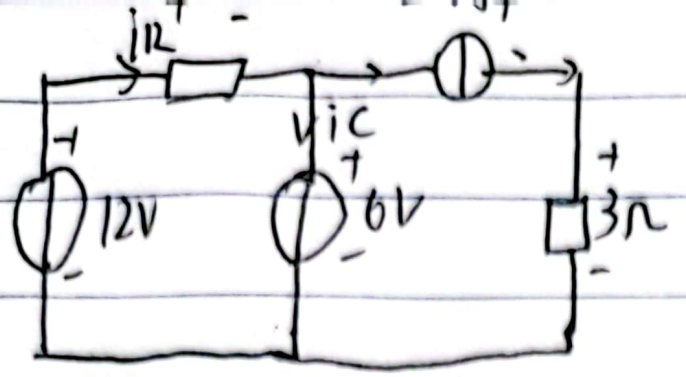
$i_L(0-)=12\times\frac{1}{3+\frac{6\times6}{6+6}}=2A$

$u_C(0-)=i_L(0-)\cdot3\Omega=6V$

易知 $i_L(0+)=i_L(0-)=2A$

$u_C(0+)=u_C(0-)=6V$

等效电路如图



$i_{R(0+)} = \frac{6}{6} = 1A$.

$i_{C(0+)} = i_{R(0+)} - i_{L(0+)}$

$= -1A$

$u_{4(0+)} = -6+6 = 0V$

$i_{C(0+)} = C \cdot \frac{du_{C(0+)}}{dt}$

$\frac{du_C}{dt}|_{0+} = \frac{1}{C} i_{C(0+)}$

$= 24 \cdot (-1)$

$= -24V/s$

$u_{L(0+)} = L \frac{di_{L(0+)}}{dt}$

$u_{L(0+)} = 0$

$\frac{di_L}{dt}|_{0+} = 0$

$\frac{di_R}{dt}|_{0+} = \frac{d(12-u_C)}{6}/dt = -\frac{1}{6} \frac{du_C}{dt}|_{0+} = 4A/s$