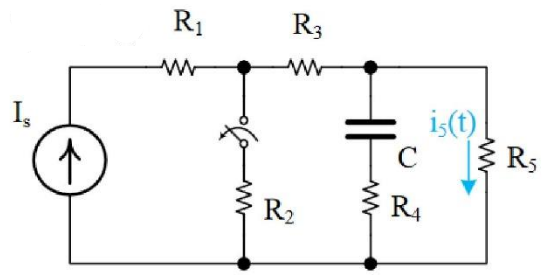
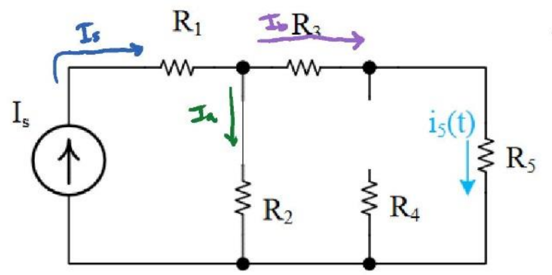


- Is = 8 A
- R1 = 4 Ω
- R2 = 6 Ω
- R3 = 12 Ω
- R4 = 4 Ω
- R5 = 2 Ω
- C = 0.1 F.

At $t < 0$ the switch is closed and the capacitor acts as an open circuit (dc steady state)

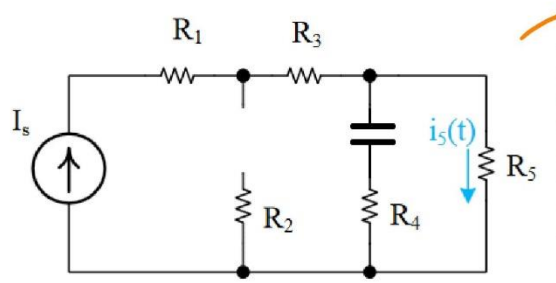


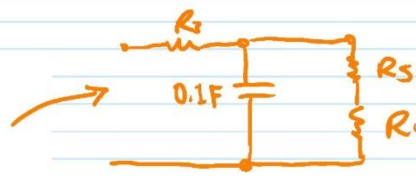
$$I_5(0) = \frac{I_S \times R_2}{(R_2+R_3+R_5)}$$

$$I_5(0) = \frac{8 \times 6\Omega}{20\Omega}$$

$$I_5(0) = 2.4A$$

After $t > 0$





$$R_{eq} = R_5 + R_4 = 2\Omega + 4\Omega$$

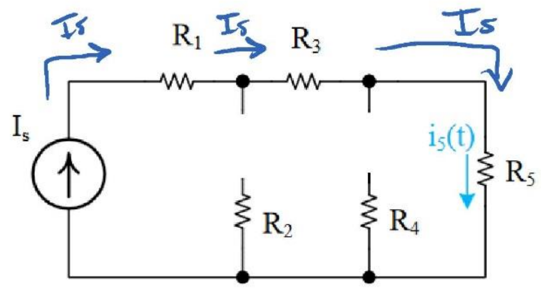
$$R_{eq} = 6\Omega$$

$$\tau = RC$$

$$\tau = (6\Omega)(0.1F)$$

$$\tau = 0.6 \text{ sec}$$

At $t = \infty$



$$I_5(\infty) = I_s = 8A$$

Current as a function of time:

$$I_5(t) = I_5(\infty) + (I_5(0) - I_5(\infty))e^{\frac{-t}{\tau}}$$

$$I_5(t) = 8A + (2.4A - 8A)e^{-t/0.6}$$

$$\boxed{I_5(t) = 8 - 5.6e^{\left(-\frac{5}{3}t\right)}}$$