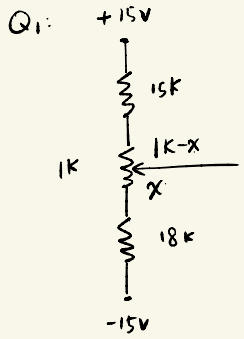
Post-lab 04

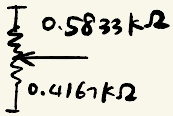
Q1:



$$V = -15 + \frac{18k+x}{18k+1k+15k} \cdot 30 = 1.25V$$

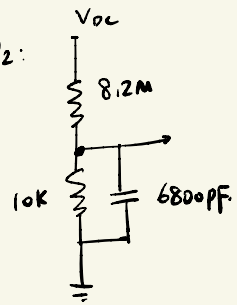
$$\Rightarrow \frac{18+x}{34} = \frac{16.25}{30} \Rightarrow x = 0.4167\,k\Omega$$

So potentiometer set up to



41.67%

Q2:



$$V_{trip} = \frac{10k}{10k+8.2M} \cdot V_{DC} = 1.25V$$

$$\Rightarrow V_{DC} = 1025\,V$$

Q3:

$$V_{initial} = 200V \times \frac{10k}{10k+8.2M} = 0.244V$$

$$V_{out} = 1500V \times \frac{10k}{10k+8.2M} = 1.827V$$

$$\tau = Req \cdot C = 10k\Omega \cdot 6800\,pF = 68\,\mu s$$

$$V_{out}(t) = 0.244 + (1.827-0.244)\left(1-e^{\frac{-t}{68\mu}}\right) = 1.25$$

$$\Rightarrow t = 68.6\,\mu s$$

Q4: No. Since it required less than 50 μs but we have 68.6 μs