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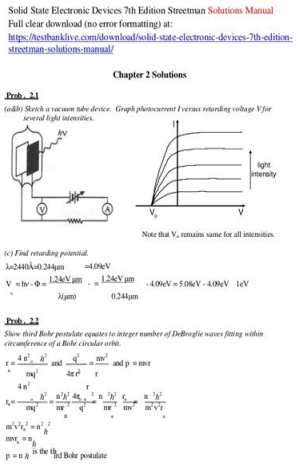
so many fake sites. this is the first one which worked! Many thanks



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Chapter 2 Solutions

Prob. 2.1

(a&b) Sketch a vacuum tube device. Graph photocurrent I versus retarding voltage V for several light intensities.

hν

light intensity

I

V_o

V

Note that V_o remains same for all intensities.

(c) Find retarding potential.

$\lambda = 2440\text{Å} = 0.244\mu m$ $= 4.09eV$

$V = h\nu - \Phi = \frac{1.24eV\,\mu m}{\lambda(\mu m)} - = \frac{1.24eV\,\mu m}{0.244\mu m} - 4.09eV = 5.08eV - 4.09eV \quad 1eV$

Prob. 2.2

Show third Bohr postulate equates to integer number of DeBroglie waves fitting within circumference of a Bohr circular orbit.

$r = \frac{4\pi\varepsilon_o n^2 \hbar^2}{mq^2}$ and $\frac{q^2}{4\pi\varepsilon_o r^2} = \frac{mv^2}{r}$ and $p = mvr$

$r_n = \frac{4\pi\varepsilon_o n^2 \hbar^2}{mq^2} = \frac{n^2\hbar^2}{mr} \frac{4\pi\varepsilon_o r}{q^2} = \frac{n^2\hbar^2}{mr^2} \frac{r_n}{mv^2} = \frac{n^2\hbar^2}{m^2v^2r}$

$m^2v^2r_n^2 = n^2\hbar^2$

$mvr_n = n\hbar$ is the third Bohr postulate

$p = n\hbar$

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