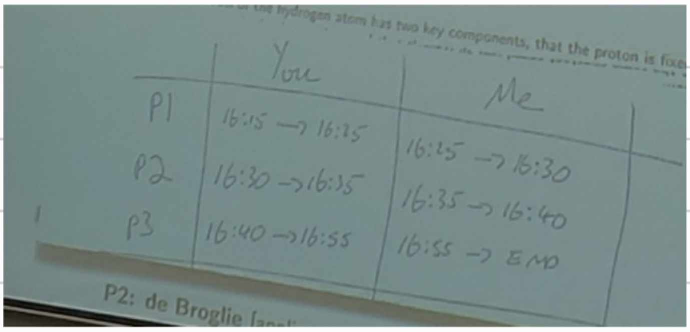


	You	Me
P1	16:15 → 16:25	16:25 → 16:30
P2	16:30 → 16:35	16:35 → 16:40
P3	16:40 → 16:55	16:55 → END

P2: de Broglie [...]

P1 : a) • limitation's => circular motion ✓

• ~~protons fixed (Newtonian models)~~

• ~~E quantised stops beyond a certain point -> fails take into account stat nature~~

• Only provides answers hydrogen atom

• no spin (fine-structure)

• no reason to quantise angular momentum

b) $r = \dfrac{-Ze^2}{4\pi\epsilon_0 V(r)}$

$= \dfrac{-Ze^2}{4\pi\epsilon_0 n^2 r \hbar^2}$

$F = m\dfrac{v^2}{r} = m\omega^2$

$= mn^2\hbar^2$

$V = n^2 r \hbar^2$

$F = V(r)$

$mn^2\hbar^2 = \dfrac{-e^2}{4\pi\epsilon_0 r}$

$\cancel{r = \dfrac{-e^2}{4\pi\epsilon_0 mn^2\hbar^2}}$

CENTRIPETAL ACC

$|F| = e^2/4\pi\epsilon_0 r^2$ COULOMB

$|F| = ma = m\left(\frac{v^2}{r}\right)$

$\dfrac{e^2}{4\pi\epsilon_0 r^2} = \dfrac{mv^2}{r}$

$v^2 = \dfrac{e^2}{4\pi\epsilon_0 m r}$ rearranging

$L = n\hbar = mvr$

$v = \dfrac{n\hbar}{mr}$

$\dfrac{4\pi\epsilon_0\hbar^2}{\ldots}\ n^2$ radius

me^2

P2: a) λ, r, n a) $C = 2\pi r = n\lambda$

$2\pi r = \frac{hn}{p}$ b) $\lambda = \frac{h}{p}$ ← de Broglie relationship

$2\pi r = \frac{nh}{p}$

$rp = \frac{nh}{2\pi}$

$\boxed{L = n\hbar}$ $\frac{h}{2\pi} = \hbar$

P3. a) $\Delta E = E_1 - E_n$

$\frac{\Delta E}{E_1} = \frac{1}{n^2}$

$n^2 \frac{0}{2} = 1$

$\frac{me^4}{32\pi^2 \epsilon_0^2 \hbar^2 n^2} = E_1 - E_n$

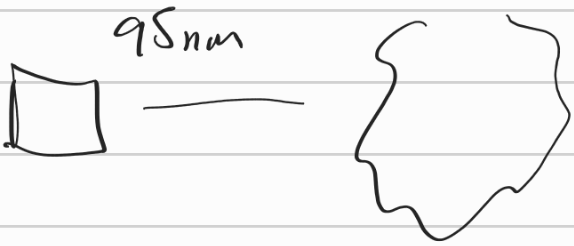
$\Delta E = \frac{1}{n^2} E_1 - E_1$

$n = \frac{1}{\frac{E}{\Delta E}}$

$n = \frac{\sqrt{32}\,\pi\,\epsilon_0 \hbar}{\sqrt{m}\, e^2 (E_1 - E_n)}$

$n = \sqrt{\frac{1}{1 - \frac{\Delta E}{E_1}}}$

b)



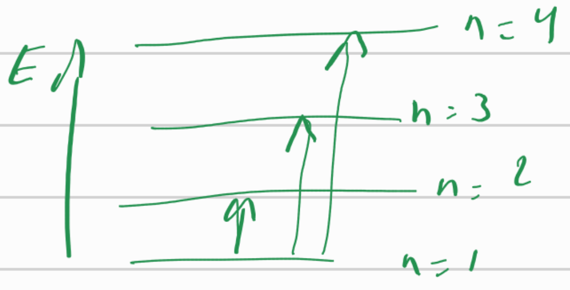
$E = hf = 2.05 \times 10^{-18}$ J

$= 13$ eV

~~Yes~~ NO

c) ~~1st excited~~ 2 4, 5, 6

a) $E_n = \frac{|E_1|}{n^2}$



$\Delta E = E_n - E_1$

$= |E_1| \left(1 - \frac{1}{n^2}\right)$

rearrange to get requested relat'

$\boxed{\text{exam qst's}}$

write what U r doing

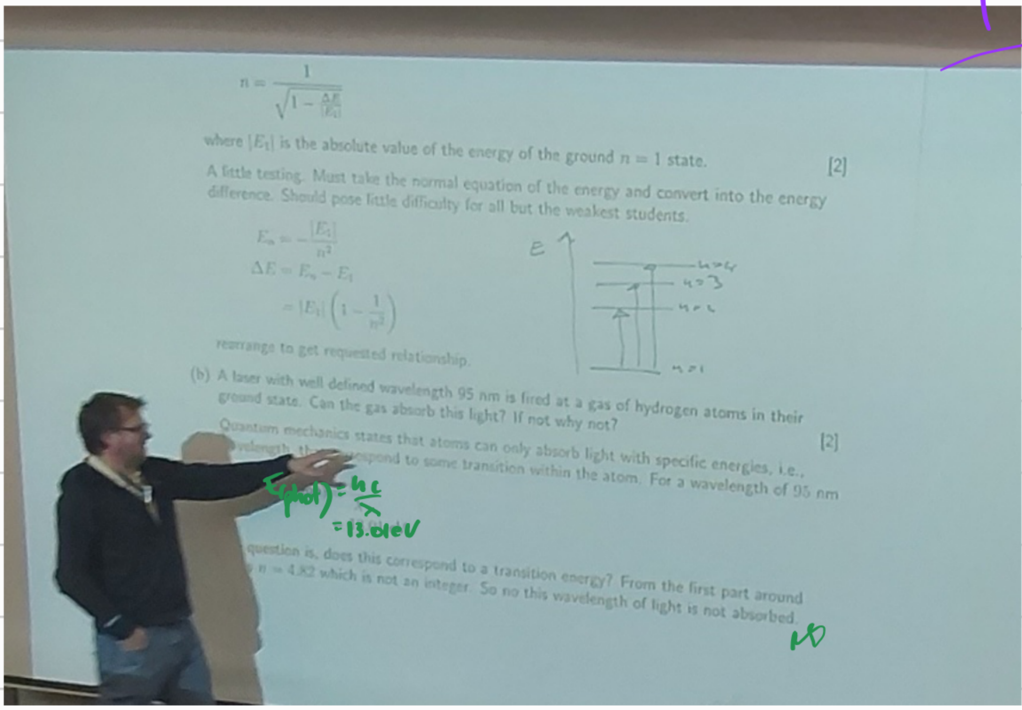
↓

do it

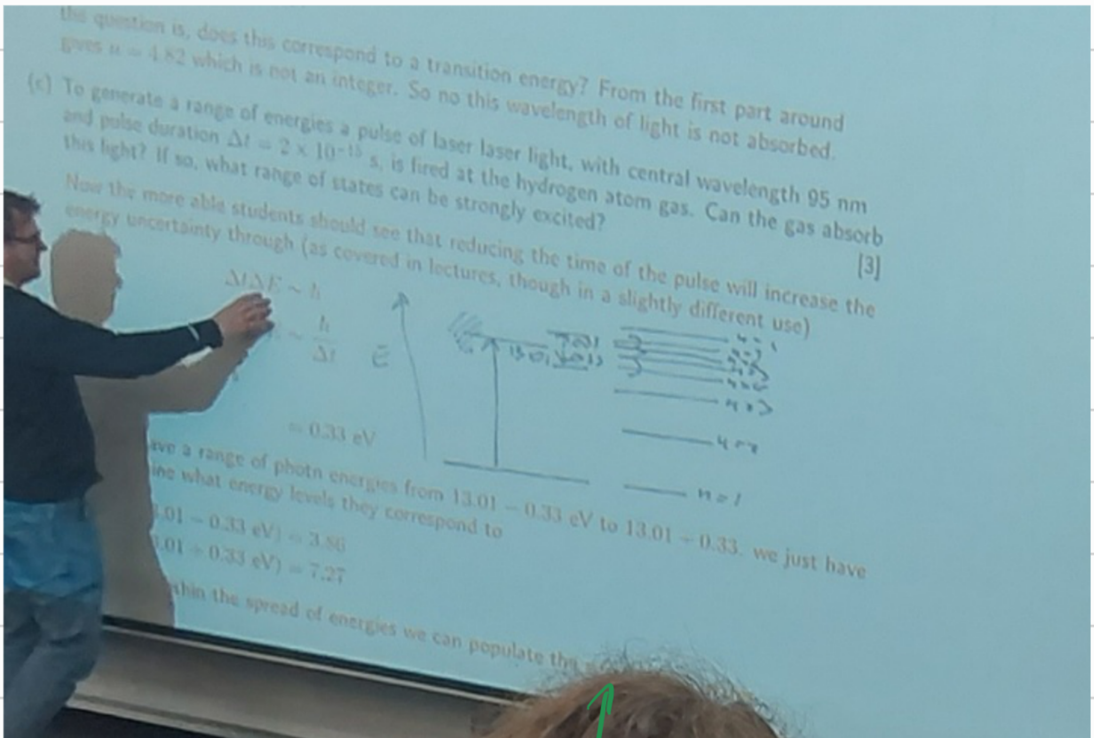
↓

results

b)



c)



4, 5, 6, 7 states

d)