(4-26) Longest & shortest wavelengths in the Lyman series ($n_f = 1$) of H atom:

Longest wavelength $\Rightarrow$ smallest $E_\gamma \Rightarrow n_i = 2$

$$\therefore E_\gamma = E_2 - E_1 = -\frac{13.6}{2^2} - \left(\frac{-13.6}{1^2}\right) = 10.2\,eV$$

$$\therefore \lambda_{longest} = \frac{c}{f} = \frac{hc}{hf} = \frac{hc}{E_\gamma} = \frac{1240\ eV.nm}{10.2\ eV} = 121\ nm$$

~~Longest~~ λ shortest : $n_i = \infty$

$$E_\gamma = \frac{-13.6}{\infty^2} - \left(\frac{-13.6}{1^2}\right) = 13.6\,eV$$

$$\lambda_{shortest} = \frac{1240\,eV.nm}{13.6\,eV} = 91.2\,nm$$

Visible Region: $400\ nm < \lambda < 750\ nm$

$\Rightarrow$ None of the Lyman series photons are visible (All are in UV region)