Given that \( h = 6.6 \times 10^{-34} \text{ J-sec} \), and that 1 eV (electron volt) of energy = \( 1.6 \times 10^{-19} \text{ J} \), what is the frequency of a 13.6 eV photon?

a) \( 7.6 \times 10^{18} \text{ Hz} \)
b) \( 6.8 \times 10^{17} \text{ Hz} \)
c) \( 5.5 \times 10^{16} \text{ Hz} \)
d) \( 3.3 \times 10^{15} \text{ Hz} \)

\( \checkmark \) d) \( 3.3 \times 10^{15} \text{ Hz} \)
e) None is within 10%
The correct answer is d); as follows.

- For a photon, Planck's law relates the energy and the frequency: \( E = h \cdot f \);
- Then \( f = E/h \), and we compute
- \( f = (13.6 \text{ ev})/(6.53 \times 10^{-34} \text{ J-sec}) = \)
- And multiply by \( 1 = (1.6 \times 10^{-19} \text{ J/ (1 eV)}, \)
- to get units, \((\text{sec})^{-1} = \text{Hz}.\)
- \( f = (13.6) \times (1.6 \times 10^{-19}) / (6.53 \times 10^{-34}) \text{ (sec)}^{-1} \)
- \( = 3.3 \times 10^{(34-19)} = 3.3 \times 10^{15} \text{ Hz}. \)
- (and what is the wave length (= c/f) of this photon?)