Solutions

Each answer shows the steps, then the **result**.

2.1

- $E = h\nu$

2.2

- $\nu = \dfrac{3.00 \times 10^{8}}{6.00 \times 10^{-7}} = 5.00 \times 10^{14}$ Hz

2.3

- $E = (6.63 \times 10^{-34})(5.0 \times 10^{14}) = 3.3 \times 10^{-19}$ J

3.1 B

- $E = h\nu$, proportional to frequency

3.2

(a)

- 650 nm $= 6.50 \times 10^{-7}$ m; $\nu = \dfrac{3.00 \times 10^{8}}{6.50 \times 10^{-7}} = 4.62 \times 10^{14}$ Hz

(b)

- $E = h\nu = (6.63 \times 10^{-34})(4.62 \times 10^{14}) = 3.06 \times 10^{-19}$ J

3.3

- UV light has a shorter wavelength and higher frequency, so by $E = h\nu$ each UV photon carries more energy — enough to break bonds/damage molecules that visible photons cannot