18. (a) For $\lambda = 565\,\text{nm}$

$$hf = \frac{hc}{\lambda} = \frac{1240\,\text{eV}\cdot\text{nm}}{565\,\text{nm}} = 2.20\ \text{eV}\ .$$

Since $\Phi_{\text{potassium}} > hf > \Phi_{\text{cesium}}$, the photoelectric effect can occur in cesium but not in potassium at this wavelength. The result of problem 3 is used in our calculation.

(b) Now $\lambda = 518\,\text{nm}$ so

$$hf = \frac{hc}{\lambda} = \frac{1240\,\text{eV}\cdot\text{nm}}{518\,\text{m}} = 2.40\,\text{eV}\ .$$

This is greater than both Φ_{cesium} and $\Phi_{\text{potassium}}$, so the photoelectric effect can now occur for both metals.