Result:

1. -1.976×10^{-19} J
2. 1005 nm

Solution:

1. $E_n = -\frac{2.179\times10^{-18}\ \text{J}}{n^2}$ $so,\ E_7 = -\frac{2.179\times10^{-18}\ \text{J}}{7^2} = -4.447 \times 10^{-20}\ \text{J}$

$$E_3 = -\frac{2.179 \times 10^{-18}\ \text{J}}{3^2} = -2.421 \times 10^{-19}\ \text{J}$$

$$\Delta E = E_{\text{final}} - E_{\text{initial}} = -2.421 \times 10^{-19}\ \text{J} - (-4.447 \times 10^{-20}\ \text{J}) = -1.976 \times 10^{-19}\ \text{J}$$

2. $\lambda = \frac{hc}{|\Delta E|} = \frac{(6.626\times10^{-34}\ \text{J s})\times(2.998\times10^{8}\ \text{m s}^{-1})}{1.976\times10^{-19}\ \text{J}} = 1005\ \times 10^{-9}\ \text{m} = 1005\ \text{nm}$