2.1 $\text{Bias} = E[z_n] - \lambda$

$E[z_n] = \frac{6}{n} E\left[\sum_{i=1}^{n} w_i\right] = \frac{6}{n} \cdot n \cdot E[w_i]$

Given that w_i is uniformly distributed $[0, \lambda]$

$E[w_i] = \lambda/2 \Rightarrow$

$E[z_n] = \frac{6}{n} \cdot n \cdot \frac{\lambda}{2} = 3\lambda$

$\boxed{\text{Bias} = 3\lambda - \lambda = 2\lambda}$

2.2 $V[z_n] = V\left[\frac{6}{n} \sum_{i=1}^{n} w_i\right] = \frac{6^2}{n^2} V\left[\sum_{i=1}^{n} w_i\right]$

Because of independence of w_i:

$V\left[\sum_{i=1}^{n} w_i\right] = n V(w_i) = n \cdot \left(E(w_i^2) - E^2(w_i)\right) =$

$= n \cdot \left(\int_0^{\lambda} x^2 \cdot \frac{1}{\lambda}\, dx - \left(\frac{\lambda}{2}\right)^2\right) = \frac{n}{12} \lambda^2$

$\boxed{V[z_n] = \frac{36}{n^2} \cdot \frac{n}{12} \lambda^2 = \frac{3}{n} \lambda^2}$

2.3 $MSE(z_n) = E[(z_n - \lambda)^2] = \underbrace{V[z_n]}_{= \frac{3}{n}\lambda^2} + (\underbrace{E[z_n]}_{= 3\lambda} - \lambda)^2 \Rightarrow$

$\boxed{MSE(z_n) = \frac{3\lambda^2}{n} + 4\lambda^2 = \lambda^2\left(4 + \frac{3}{n}\right)}$