Q2:

a) $1-\frac{1}{N}\sum_{i=1}^{N} I[\max\{r_1^{(i)}, r_2^{(i)}, r_3^{(i)}\}=0]$. We estimate the prob. of at least one day would rain by estimating the prob. of none of the day rains, this prob. can be estimated by counting the event that $\max\{r_1^{(i)}, r_2^{(i)}, r_3^{(i)}\}=0$, which means none of the three days would rain.

b) Estimator 1: unbiased

Estimator 2: biased

Estimator 3: biased

c) Estimator 1. Since estimator 2 & 3 are just one bernoulli r.v., the variance is not reduced by sample number N, but the estimator 1's variance is reduced due to sampling N times.