Question #179
Key: D

For an exponential distribution, the maximum likelihood estimate of θ is the sample mean, 6. Let $Y = X_1 + X_2$ where each X has an exponential distribution with mean 6. The sample mean is $Y/2$ and Y has a gamma distribution with parameters 2 and 6.

$$\Pr(Y/2 > 10) = \Pr(Y > 20) = \int_{20}^{\infty} \frac{xe^{-x/6}}{36}\,dx$$

Then

$$= -\frac{xe^{-x/6}}{6} - e^{-x/6}\Big|_{20}^{\infty} = \frac{20e^{-20/6}}{6} + e^{-20/6} = 0.1546.$$