

Question #6

Key: D

For the method of moments estimate,

$$386 = e^{\mu + .5\sigma^2}, \quad 457,480.2 = e^{2\mu + 2\sigma^2}$$

$$5.9558 = \mu + .5\sigma^2, \quad 13.0335 = 2\mu + 2\sigma^2$$

$$\hat{\mu} = 5.3949, \quad \hat{\sigma}^2 = 1.1218.$$

Then

$$\begin{aligned} E(X \wedge 500) &= e^{5.3949 + .5(1.1218)} \Phi\left(\frac{\ln 500 - 5.3949 - 1.1218}{\sqrt{1.1218}}\right) + 500 \left[1 - \Phi\left(\frac{\ln 500 - 5.3949}{\sqrt{1.1218}}\right)\right] \\ &= 386\Phi(-.2853) + 500[1 - \Phi(.7739)] \\ &= 386(.3877) + 500(.2195) = 259. \end{aligned}$$

Note-these calculations use exact normal probabilities. Rounding and using the normal table that accompanies the exam will produce a different numerical answer but the same letter answer.