LAST NAME (Print): _____ FIRST: _____

Statistics 111 **Quiz 13**

1. _____ Assume that the number of driving accidents a person has in their life follows a Poisson distribution with unknown parameter λ. You think λ has a Gamma(1, 3) distribution. Among four elderly people who have stopped driving, they report 0, 2, 3, and 0 accidents. What is your posterior distribution for λ?

2. The NSF wants to know what proportion of Duke econ majors are women. Based on data from other universities, the NSF thinks the proportion has beta distribution with parameters $\alpha = 2$ and $\beta = 5$. They sample ten Duke econ majors at random, and eight are female. What is (a) their new belief about the distribution of p at Duke, and (b) what is the mean of their belief.

   (a) _____ (b) _____

_____ 3. A sample of 100 Duke students have sample mean GPA 3.00 and sample standard deviation 0.4. Set a one-sided 95% upper confidence interval on the mean GPA of all Duke students.

_____ 4. A sample of 10 Duke students have sample mean GPA 3.00 and sample standard deviation 0.4. Set a one-sided 95% upper confidence interval on the mean GPA of all Duke students.

_____ 5. A sample of 10 Duke students from a class of 20 have sample mean GPA 3.00 and sample standard deviation 0.4. Set a one-sided 95% upper confidence interval on the mean GPA of the class.

6. List all, and only, the true statements. (6 pts) _____

   A. As $1 - \alpha$ increases, the width of the interval decreases.

   B. As σ increases, the width of the interval decreases.

   C. As n increases, the width of the interval decreases.

   D. As the FPCF increases, the width of the interval decreases.

   E. If a 95% CI on mean GPA is [3, 3.2], then you expect that 95% of the students will have GPAs in this range.

   F. MLEs are asymptotically unbiased and have minimum variance.