

Question #257

Key: C

The estimate of the overall mean, μ , is the sample mean, per vehicle, which is $7/10 = 0.7$.

With the Poisson assumption, this is also the estimate of $\nu = \text{EPV}$. The means for the two insureds are $2/5 = 0.4$ and $5/5 = 1.0$. The estimate of a is the usual non-parametric estimate,

$$\text{VHM} = \hat{a} = \frac{5(0.4 - 0.7)^2 + 5(1.0 - 0.7)^2 - (2 - 1)(0.7)}{10 - \frac{1}{10}(25 + 25)} = 0.04$$

(The above formula: Loss Models page 596, Herzog page 116, Dean page 25)

Then, $k = 0.7/0.04 = 17.5$ and so $Z = 5/(5+17.5) = 2/9$. The estimate for insured A is $(2/9)(0.4) + (7/9)(0.7) = 0.6333$.