Question #240
Key: D

$$\bar{x} = \frac{5000(0) + 2100(1) + 750(2) + 100(3) + 50(4)}{8000} = 0.5125 \text{ and}$$

$$s^2 = \frac{5000(0.5125)^2 + 2100(0.4875)^2 + 750(1.4875)^2 + 100(2.4875)^2 + 50(3.4875)^2}{7999} = 0.5874.$$

Then, $\hat{\mu} = \hat{v} = \bar{x} = 0.5125$ and $\hat{a} = s^2 - \bar{x} = 0.0749$. The credibility factor is

$$Z = \frac{1}{1 + 0.5125/0.0749} = 0.1275 \text{ and the estimate is } 0.1275(1) + 0.8725(0.5125) = 0.5747.$$