

Question #62**Answer is D**

The number of claims for each insured has a binomial distribution with $n = 1$ and q unknown. We have

$$\mu(q) = q, v(q) = q(1 - q)$$

$$\mu = E(q) = 0.1, \text{ given in item (iv)}$$

$$a = \text{Var}(q) = E(q^2) - E(q)^2 = E(q^2) - 0.01 = 0.01, \text{ given in item (v)}$$

$$\text{Therefore, } E(q^2) = 0.02$$

$$v = E(q - q^2) = 0.1 - 0.02 = 0.08$$

$$k = v/a = 8, Z = \frac{10}{10+8} = 5/9.$$

Then the expected number of claims in the next one year is $(5/9)(0) + (4/9)(0.1) = 2/45$ and the expected number of claims in the next five years is $5(2/45) = 2/9 = 0.22$.