

Question #67

Answer is E

$$\mu(r) = E(X | r) = E(N)E(Y) = r\beta\theta / (\alpha - 1) = 100r$$

$$\begin{aligned}v(r) &= \text{Var}(X | r) = \text{Var}(N)E(Y)^2 + E(N)\text{Var}(Y) \\ &= r\beta(1 + \beta)\theta^2 / (\alpha - 1)^2 + r\beta\alpha\theta^2 / [(\alpha - 1)^2(\alpha - 2)] = 210,000r.\end{aligned}$$

$$v = E(210,000r) = 210,000(2) = 420,000$$

$$a = \text{Var}(100r) = (100)^2(4) = 40,000$$

$$k = v / a = 10.5$$

$$Z = 100 / (100 + 10.5) = 0.905.$$