

Question #103

Answer: B

$$\begin{aligned} {}_k P_x^{(\tau)} &= e^{-\int_0^k \mu_{x+t}^{(\tau)} dt} = e^{-\int_0^k 2\mu_{x+t}^{(1)} dt} \\ &= \left(e^{-\int_0^k \mu_{x+t}^{(1)} dt} \right)^2 \\ &= ({}_k P_x)^2 \text{ where } {}_k P_x \text{ is from Illustrative Life Table, since } \mu^{(1)} \text{ follows I.L.T.} \\ {}_{10} P_{60} &= \frac{6,616,155}{8,188,074} = 0.80802 \\ {}_{11} P_{60} &= \frac{6,396,609}{8,188,074} = 0.78121 \\ {}_{10|} q_{60}^{(\tau)} &= {}_{10} P_{60}^{(\tau)} - {}_{11} P_{60}^{(\tau)} \\ &= ({}_{10} P_{60})^2 - ({}_{11} P_{60})^2 \text{ from I.L.T.} \\ &= 0.80802^2 - 0.78121^2 = 0.0426 \end{aligned}$$