

Question #221

Answer: B

$$\ddot{a}_{30:\overline{20}|} = \ddot{a}_{30:\overline{10}|} + {}_{10}E_{30} \times \ddot{a}_{40:\overline{10}|}$$

$$15.0364 = 8.7201 + {}_{10}E_{30} \times 8.6602$$

$${}_{10}E_{30} = (15.0364 - 8.7201) / 8.6602 = 0.72935$$

Expected present value (EPV) of benefits =

$$= 1000 \times A_{40:\overline{10}|}^1 + 2000 \times {}_{10}E_{30} \times A_{50:\overline{10}|}^1$$

$$= 16.66 + 2 \times 0.72935 \times 32.61 = 64.23$$

EPV of premiums = $\pi \times \ddot{a}_{30:\overline{10}|} + 2\pi \times 0.72935 \times \ddot{a}_{40:\overline{10}|}$

$$= \pi \times 8.7201 + 2 \times \pi \times 0.72935 \times 8.6602$$

$$= 21.3527\pi$$

$$\pi = 64.23 / 21.3527 = 3.01$$