EXAM MLC QUESTIONS OF THE WEEK

S. Broverman, 2007

Week of March 5/07

The actuarial present value of an annuity-immediate that pays \$1000 per annum while (65) and (70) are both alive, \$800 per annum while only (65) is alive and \$500 per annum while only (70) is alive is \$10,390. For independent lives, if $a_{65} = 10.553$ and $a_{70} = 8.780$, then $a_{65:70} =$

A) 8.10 B) 8.14 C) 8.18 D) 8.22 E) 8.26

The solution can be found below.

Week of March 5/07 - Solution

$$10{,}390 = 1000 \cdot a_{65:70} + 800 \cdot \sum_{k=1}^{\infty} v^k \cdot {}_kp_{65} \cdot {}_kq_{70} \; + \; 500 \cdot \sum_{k=1}^{\infty} v^k \cdot {}_kp_{70} \cdot {}_kq_{65}$$

$$= 1000 \cdot a_{65:70} + 800 \cdot (a_{65} - a_{65:70}) + 500 \cdot (a_{70} - a_{65:70}) = 800 \cdot a_{65} + 500 \cdot a_{70} - 300 \cdot a_{65:70}$$

$$\rightarrow a_{65:70} = \frac{-10{,}390 + 800 \cdot a_{65} + 500 \cdot a_{70}}{300} = 8.14 \text{ .} \quad \text{Answer: B.}$$