Corrections and Modifications to 2016 EA-2L Exam Solutions (as of 3/29/2017)

Question 23: The annuity factors provided in this question are annual annuities, not annual annuities payable monthly. Recall the standard approximation:

$$\ddot{a}_x^{(12)} = \ddot{a}_x - \frac{11}{24}$$

Using that approximation,

$$\ddot{a}_{64}^{(12)} = \ddot{a}_{64} - \frac{11}{24} = 15.84 - \frac{11}{24} = 15.382$$
$$\ddot{a}_{65}^{(12)} = \ddot{a}_{65} - \frac{11}{24} = 15.35 - \frac{11}{24} = 14.892$$

This changes the numerical solution to this question as follows.

Smith category 5 PVAB = $\$1{,}998 \times 12 \times \ddot{a}_{65}^{(12)}$
$= \$1{,}998 \times 12 \times 14.892 = \$357{,}051$
Jones category 5 PVAB = $\$224.25 \times 12 \times \ddot{a}_{64}^{(12)}$
$= \$224.25 \times 12 \times 15.382 = \$41{,}393$

Total PVAB in category 5 = $357,051 + $41,393 = $398,444

Question 41: The annuity factors provided in this question are annual annuities, not annual annuities payable monthly. Recall the standard approximation:

$$\ddot{a}_x^{(12)} = \ddot{a}_x - \frac{11}{24}$$

Using that approximation,

$$\ddot{a}_{65}^{(12)} = \ddot{a}_{65} - \frac{11}{24} = 9.54 - \frac{11}{24} = 9.0817$$
$$\ddot{a}_{66}^{(12)} = \ddot{a}_{66} - \frac{11}{24} = 9.23 - \frac{11}{24} = 8.7717$$
$$\ddot{a}_{67}^{(12)} = \ddot{a}_{67} - \frac{11}{24} = 8.92 - \frac{11}{24} = 8.4617$$

This changes the numerical solution to this question as follows.

<u>Smith</u>

Smith reached normal retirement age on 1/1/2014, with 9 years of service at that time.

Normal retirement benefit on 1/1/2014 = $75 × 9 years of service = $675

Actuarial equivalent of this benefit on 1/1/2015 = $675 × $\ddot{a}_{65}^{(12)}$ × 1.05 ÷ $\ddot{a}_{66}^{(12)}$
= $675 × 9.0817 × 1.05 ÷ 8.7717
= $733.80

Accrued benefit on 1/1/2015 = $75 × 10 years of service = $750

The larger of the actuarial equivalent benefit and the accrued benefit is $750 as of 1/1/2015.

Actuarial equivalent of this benefit on 1/1/2016 = $750 × $\ddot{a}_{66}^{(12)}$ × 1.05 ÷ $\ddot{a}_{67}^{(12)}$
= $750 × 8.7717 × 1.05 ÷ 8.4617
= $816.35

Accrued benefit on 1/1/2016 = $75 × 11 years of service = $825

The larger of the actuarial equivalent benefit and the accrued benefit is $825 as of 1/1/2016. X = $825.

<u>Jones</u>

Jones reached normal retirement age on 1/1/2015, with 19 years of service at that time.

Normal retirement benefit on 1/1/2015 = $75 × 19 years of service = $1,425

Actuarial equivalent of this benefit on 1/1/2016 = $1,425 × $\ddot{a}_{65}^{(12)}$ × 1.05 ÷ $\ddot{a}_{66}^{(12)}$
= $1,425 × 9.0817 × 1.05 ÷ 8.7717
= $1,549.13

Accrued benefit on 1/1/2016 = $75 × 20 years of service = $1,500

The larger of the actuarial equivalent benefit and the accrued benefit is $1,549.13 as of 1/1/2016. Y = $1,549.13.

|X – Y| = |$825 - $1,549.13| = $724.13