

**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.

$$\begin{aligned} \text{Smith category 5 PVAB} &= \$1,998 \times 12 \times \ddot{a}_{65}^{(12)} \\ &= \$1,998 \times 12 \times 14.892 = \$357,051 \end{aligned}$$

$$\begin{aligned} \text{Jones category 5 PVAB} &= \$224.25 \times 12 \times \ddot{a}_{64}^{(12)} \\ &= \$224.25 \times 12 \times 15.382 = \$41,393 \end{aligned}$$

$$\text{Total PVAB in category 5} = \$357,051 + \$41,393 = \$398,444$$

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.

Smith

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

$$\begin{aligned}
 \text{Actuarial equivalent of this benefit on 1/1/2015} &= \$675 \times \cancel{a_{\overline{65}|}^{(12)}} \times 1.05 \div \cancel{a_{\overline{66}|}^{(12)}} \\
 &= \$675 \times 9.0817 \times 1.05 \div 8.7717 \\
 &= \$733.80
 \end{aligned}$$

$$\text{Accrued benefit on 1/1/2015} = \$75 \times 10 \text{ years of service} = \$750$$

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

$$\begin{aligned}
 \text{Actuarial equivalent of this benefit on 1/1/2016} &= \$750 \times \cancel{a_{\overline{66}|}^{(12)}} \times 1.05 \div \cancel{a_{\overline{67}|}^{(12)}} \\
 &= \$750 \times 8.7717 \times 1.05 \div 8.4617 \\
 &= \$816.35
 \end{aligned}$$

$$\text{Accrued benefit on 1/1/2016} = \$75 \times 11 \text{ years of service} = \$825$$

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

Jones

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

$$\text{Normal retirement benefit on 1/1/2015} = \$75 \times 19 \text{ years of service} = \$1,425$$

$$\begin{aligned}
 \text{Actuarial equivalent of this benefit on 1/1/2016} &= \$1,425 \times \cancel{a_{\overline{65}|}^{(12)}} \times 1.05 \div \cancel{a_{\overline{66}|}^{(12)}} \\
 &= \$1,425 \times 9.0817 \times 1.05 \div 8.7717 \\
 &= \$1,549.13
 \end{aligned}$$

$$\text{Accrued benefit on 1/1/2016} = \$75 \times 20 \text{ years of service} = \$1,500$$

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

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