Errata and Updates for ASM Exam LTAM (Second Edition Second Printing) Sorted by Date

[2/15/2022] On page 317, in the solution to Example 17B, on the line for A_{35}, on the line for A_{35}, replace the numerator of the second fraction with $(1-0.000195)(0.000205)$.

[10/7/2021] On page 1093, on the last line of the page, change $\frac{a}{2b}$ to $\frac{b}{2a}$. Accordingly, the last two lines can be combined into one line:

$$\frac{b}{2a} \qquad b \le \min(a, n)$$

[10/7/2021] On page 1154, 3 lines from the bottom of the page, change the second "insurance" to "insurances". On the next line, change 148.936 to 14,893.6 and 130,435 to 13,043,5. On the last line, change the final answer 5,151.89 to 4,495.84.

[9/18/2021] On page 1608, in the solution to question 2(b), change 174,349.35 to177,686.10 on the last two lines, once apiece on each line. In the solution to question 2(c), on the last line, change 174,349.35 to 177,686.10 and change 11,325.02 to 11,450.14.

[7/7/2021] On page 892, in the solution to exercise 47.25, on the first two displayed lines, change p_{x+t}^{03} and p_{x+t}^{13} to p_{x+5}^{03} and p_{x+5}^{13} respectively.

[7/7/2021] On page 911, exercise 48.3 is defective and should be skipped. It is inappropriate to use the claim acceleration method on annuities. It should only be used for insurance benefits, benefits paid upon a transition.

[7/7/2021] On page 916, in exercise 48.12, the benefit of 20,000 at the end of the year of death from chronical illness is in lieu of the 100,000 death benefit paid if one dies from a healthy state. (This is an unusual accelerated death benefit).

[7/7/2021] On page 921, exercise 48.23 is defective and should be skipped. The solution is incorrect, since it does not distinguish between an insurance that pays upon transition to state 3 regardless of the starting state of the transition and an insurance that pays upon transition to state 3 only if the transition starts in states 0 or 1.

[7/7/2021] On page 925, in the solution to exercise 48.6, on the seventh and eight linea, add "dt before the first equal sign on each line.

[7/6/2021] On page 175, exercise 10.10 belongs at the end of the exercises for Lesson 20.

[7/6/2021] On page 192, in the solution to exercise 11.3, on the second line, change $-c+\sigma_k Z(11)$ to $+c+\sigma_k Z_{11}$ and change $0.01Z_{11}$ to $0.1Z_{11}$.

[7/6/2021] On page 193, in the solution to exercise 11.10, on the las line of the page, change $0.01Z_{2017}^{(2)}$ to $0.05Z_{2017}^{(2)}$.

[7/6/2021] On page 194, in the solution to exercise 11.11(b), on the fist line, change $Z_{2019}^{(1)}$ to $Z_{2019}^{(2)}$ in two places.

[7/5/2021] On page 175, exercise 10.10 belongs at the end of the exercises for Lesson 20.

[7/4/2021] On page 893, in the solution to exercise 47.28, on the fifth through seventh lines, the (12) in the subscripts should be moved to the superscripts; change $\ddot{a}_{(12)55}^{01}$ to $\ddot{a}_{55}^{(12)01}$, $\ddot{a}_{(12)65}^{01}$ to $\ddot{a}_{65}^{(12)01}$, and $\ddot{a}_{(12)65}^{11}$ to $\ddot{a}_{65}^{(12)11}$.

[7/4/2021] On page 926, in the solution to exercise 48.11, on the second line, change $(\bar{D}\bar{A})_{x:\overline{10}|}^{13}$ to $(\bar{D}\bar{A})_{50+t:\overline{10}|}^{13}$. Make the same change on line 6, and on lines 6–9, change all nine ts to us. On line 7, add "du" at the end of the line.

[7/2/2021] On pages 890-891, make the following corrections to the solution to exercise 47.18:

- On the last line of page 890, change $\bar{a}_{40}^{11}$ to $\bar{a}_{x}^{11}$.
- On the third line of page 891, delete $\bar{a}_{40+t}^{11}$ from both integrals.
- On the seventh line of page 891, change e^1 to e^{-1}.

[7/2/2021] On page 892, in the solution to exercise 47.22, on the last line, change ${}_5V^{(1)}$ to ${}_{10}V^{(1)}$.

[6/28/2021] On page 183, 3 lines above Example 11D, replace the sentence beginning with “So the distribution” with

So the distribution of $1-\phi^m(x,t)$ has a mean that is 1 minus the mean of that lognormal and variance equal to the variance of that lognormal.

[6/28/2021] On page 195, in the solution to exercise 11.13, replace all lines after “Subtract the third equation from this to eliminate $K_{2020}^{(1)}$ with

$$\begin{aligned}
-2K_{2020}^{(3)} &= -0.020243\\
K_{2020}^{(3)} &= 0.010121\\
K_{2020}^{(1)} &= -4.01946+142(0.010121) = -2.582232\\
K_{2020}^{(2)} &= 4.18459-0.04-139(0.010121)-2.582232 = 0.155484
\end{aligned}$$

Now we’re ready to calculate q_{71} in 2020. The cohort factor for it is $G_{2020-71} = -0.05$.

$$\begin{aligned}
l\,q(71,2020) &= -2.582232+0.155494+(1^2-140)(0.010121)-0.05 = -3.88360\\
q(71,2020) &= \frac{e^{-3.88360}}{1+e^{-3.88360}} = \boxed{\mathbf{0.020162}}
\end{aligned}$$

[6/16/2021] On page 553, in the solution to exercise 29.10, change the last line to

$$P = \frac{100{,}000(0.05413)}{12(7.7210)} = \boxed{\mathbf{58.4267}}$$

[3/15/2021] On page 1324, replace the solution to exercise 71.28 with

The amount of time in state 0 is 1 apiece for the 8 policyholders who didn’t transition, 0.7 for the first transitioner, and $0.2+(0.6-0.3)=0.5$ for the second transitioner, a total of $8(1)+0.7+0.5=9.2$. In addition, the disabled policyholder who becomes healthy at time 0.4 spends 0.6 in state 0. So total exposure for state 0 is 9.8. There are three transitions to state 1; the two transitions of the second transitioner count as 2, not as 1. The estimate of $\mathrm{Var}(\hat{\mu}^{01})$ is $3/9.8^2$, and the square root of that is $\sqrt{3}/9.8 = \boxed{\mathbf{0.176740}}$.

[3/9/2021] On page 1116, in the solution to exercise 59.6, on the third line, change $\mu_{x+t:y+t}^{01}$ to $\mu_{x+t:y+t}^{02}$.

[1/4/2021] On page 178, in the solution to Quiz 10-1, on the last line, change $2020+28=\boxed{\mathbf{2048}}$ to $2020+29=\boxed{\mathbf{2049}}$.

[1/4/2021] On page 181, on the second line of the solution to Example 11B, change K_t to K_{t+1}.

[1/4/2021] On page 184, in Example 11E, question 3, change “$q(50,1)$ is greater than 0.007” to “$q(50,1)$ is less than 0.007”.

[12/27/2020] On page 872, make the following corrections to the Woolhouse formulas:

- In formula (47.7), change $\bar{a}_x^{ij}$ to $\bar{a}_x^{ii}$.
- In formula (47.9), change $\bar{a}_x^{ij}$ to $\bar{a}_x^{ii}$.
- In formula (47.11), delete the plus sign after the minus sign.

[12/27/2020] On page 873, fix equations (47.7), (47.9), and (47.11) as indicated in the errata for page 872. Also, delete the second line under Two-term Woolhouse formulas, and on the first line, change the equation number (47.12) to (47.6).

[12/16/2020] On page 1890, the solution to 1(a)(ii) is incorrect. The correct solution is

By equation (25.7), Woolhouse's formula (first two terms only)

$$\ddot{a}_{45}^{(12)} = \ddot{a}_{45} - \frac{11}{24} = 14.4893 - \frac{11}{24} = 14.03097$$

Multiplying this by the annual amount of 48,000, we find that the APV of the monthly annuity-due is $\boxed{\textbf{673,486}}$.

[12/16/2020] On page 1893, 3 lines from the end of the page, 0.38424 should be 0.34824. As a result, the solutions to 4(c), 4(d), and 4(e) are incorrect. The correct solutions are

(c) [**Lesson 60**] The EPV of benefits is

$$100{,}000(2A_{50} - A_{50:50}) = 100{,}000\big(2(0.18931) - 0.24669\big) = 13{,}193$$

The EPV of 1 unit of premium per year is $\ddot{a}_{\overline{50:50}}$ minus $\ddot{a}_{\overline{50:50}:\overline{20}|} - \ddot{a}^{(2)}_{\overline{50:50}:\overline{20}|}$.

$$\ddot{a}_{\overline{50:50}} = 2\ddot{a}_{50} - \ddot{a}_{50:50} = 2(17.0245) - 15.8195 = 18.2295$$

From part (b), the item to subtract is $2(0.25)(1 - {}_{20}E_{50}) - 0.25(1 - {}_{20}E_{50:50})$:

$$2(0.25)(1 - 0.34824) - 0.25(1 - 0.32177) = 0.1563$$

So the EPV of 1 unit of premium per year is $18.2295 - 0.1563 = 18.0732$. The gross premium is

$$G = \frac{13{,}193}{0.9(18.07321) - 0.7} = \boxed{\textbf{847.56}}$$

(d) [**Lesson 60**]

(i)

$$\begin{aligned} {}_{20}V &= 100{,}000A_{\overline{70:70}} - 0.9G\,\ddot{a}_{\overline{70:70}} \\ A_{\overline{70:70}} &= 2(0.42818) - 0.52488 = 0.33148 \\ \ddot{a}_{\overline{70:70}} &= 2(12.0083) - 9.9774 = 14.0392 \end{aligned}$$

$\ddot{a}_{\overline{70:70}}$ may also be computed using $\ddot{a}_{\overline{70:70}} = \frac{1 - A_{\overline{70:70}}}{d}$

$${}_{20}V = 33{,}148 - 0.9(847.56)(14.0392) = \boxed{\textbf{22,439}}$$

(ii)

$$\begin{aligned} {}_{20}V &= 100{,}000A_{70} - 0.9G\,\ddot{a}_{70} \\ &= 42{,}818 - 0.9(847.56)(12.0083) = \boxed{\textbf{33,658}} \end{aligned}$$

(e) [**Section 47.4 and Lesson 60**] We will use multistate recursion from time 20.

$$\begin{aligned}({}_{19.5}V + 0.9(0.5G))(1+i)^{0.5} &= ({}_{0.5}p_{69.5})^2\,{}_{20}V^{(\text{both alive})} + 2\,{}_{0.5}p_{69.5}\,{}_{0.5}q_{69.5}\,{}_{20}V^{(\text{one alive})}\\ &\quad + ({}_{0.5}q_{69.5})^2(100{,}000)\\ {}_{0.5}p_{69.5} &= p_{69}^{0.5} = (1-0.009294)^{0.5} = 0.9953422\\ \Big({}_{19.5}V + 0.9\big(0.5(847.56)\big)\Big)(1.05)^{0.5} &= 0.990706(22{,}439) + 2(0.9953422)(1-0.9953422)(33{,}658)\\ &\quad + (1-0.9953422)^2(100{,}000) = 22{,}545\\ {}_{19.5}V &= \frac{22{,}545}{1.05^{0.5}} - 0.9\big(0.5(847.56)\big) = \boxed{\mathbf{21{,}620}}\end{aligned}$$