ERRATA for the Solutions Manual

Chapter 1.

Exercise 14. There should be " ... If $u(x) = -1/x^{\alpha}$ for $\alpha > 0$, then $u^{-1}(y) = (-1/y)^{1/\alpha}$, and $c(X) = (E\{X^{-\alpha}\})^{-1/\alpha}$. ..."

Chapter 2.

Exercise 10. There should be
"(a) ... The probability that an injury will result in a claim is

$$P(\xi > 6) = 0.4 \cdot \frac{1}{1 + (6/5)^3} + 0.6 \cdot \frac{1}{1 + (6/3)^2} \approx 0.267.$$

(b) The probability that a particular contract will result in a claim is $qP(\xi > 6) \approx 0.0134$."

Chapter 4.

Exercise 21. ... Taking into account a deductible of 50, we should find $P(S > 250) \approx 1 - \Gamma(250, 0.12, 23.53) \approx 0.097$ (instead of 0.4345).

Exercise 22a. $E\{S\} = \left(2 \cdot \frac{1}{3} + 3 \cdot \frac{1}{2} + 4 \cdot \frac{1}{6}\right) \cdot 150 = 425$; $Var\{S\} = \left(2^2 \cdot \frac{1}{3} + 3^3 \cdot \frac{1}{2} + 4^2 \cdot \frac{1}{6}\right) \cdot 150 = 1275$.

Exercise 34b. $E\{S\} = \frac{35000}{3}$ (instead of $\frac{3500}{3}$).

Chapter 5.

Exercise 1(b). There should be "... $P(N_2 = 2 \,|\, N_{1.5} = 2,\ N_1 = 2) = 0$ ... " and "... $P(N_2 = 2 \,|\, N_{1.5} = 2) > 0$ ... ".

Exercise 2. The words "... should be much larger ..." should be replaced by "... should be smaller... ".

Exercise 9d. ... The question concerns the standard deviation equal to $\sqrt{0.16} = 0.4$.

Exercise 12c. ...$E\{T_{n+m} \,|\, N_t = n\} = t + E\{T_m\} = t + \frac{m}{\lambda}$. ...

Exercise 44. In the representation for $E\{K \,|\, X_0 = 0,\, X_1 = 1\}$ the term "1+" has been missed, so equation (M-5.1) is wrong. *To make it more convenient,* we repeat the whole solution.
Let K be the number of time moments when the process X_t under consideration is in the state

0. Set $m_0 = E\{K \,|\, X_0 = 0\}$, and $m_1 = E\{K \,|\, X_0 = 1\}$. We may write

$$\begin{aligned}
m_0 &= E\{K \,|\, X_0 = 0,\, X_1 = 0\}P(X_1 = 0 \,|\, X_0 = 0) \\
+E\{K \,|\, X_0 &= 0,\, X_1 = 1\}P(X_1 = 1 \,|\, X_0 = 0) + E\{K \,|\, X_0 = 0,\, X_1 = 2\}P(X_1 = 2 \,|\, X_0 = 0) \\
+E\{K \,|\, X_0 &= 0,\, X_1 = 3\}P(X_1 = 3 \,|\, X_0 = 0).
\end{aligned}$$

Since the process is Markov,
$E\{K \,|\, X_0 = 0,\, X_1 = 0\} = 1 + E\{K \,|\, X_1 = 0\} = 1 + m_0$;
$E\{K \,|\, X_0 = 0,\, X_1 = 1\} = E\{K \,|\, X_1 = 1\} = 1 = 1 + m_1$;
$E\{K \,|\, X_0 = 0,\, X_1 = 2\} = 1$, $E\{K \,|\, X_0 = 0,\, X_1 = 3\} = 1$.
Then,

$$m_0 = (1 + m_0) \cdot 0.9 + (1 + m_1) \cdot 0.05 \, + 0.01 + 0.04,$$

and

$$2m_0 = 20 + \, m_1. \tag{5.1}$$

Similarly,

$$\begin{aligned}
m_1 &= E\{K \,|\, X_0 = 1,\, X_1 = 0\}P(X_1 = 0 \,|\, X_0 = 1) \\
+E\{K \,|\, X_0 &= 1,\, X_1 = 1\}P(X_1 = 1 \,|\, X_0 = 1) + E\{K \,|\, X_0 = 1,\, X_1 = 2\}P(X_1 = 2 \,|\, X_0 = 1) \\
+E\{K \,|\, X_0 &= 1,\, X_1 = 3\}P(X_1 = 3 \,|\, X_0 = 1) = 0.1m_0 + 0.8m_1 + 0 + 0,
\end{aligned}$$

and $0.2m_1 = 0.1m_0$, or

$$m_0 = 2m_1.$$

Together with (M-5.1), it gives $m_1 = \frac{20}{3}$, and $m_0 = \frac{40}{3}$.
Next,

$$\begin{aligned}
E\{K\} &= E\{K \,|\, X_0 = 0\}P(X_0 = 0) + E\{K \,|\, X_0 = 1\}P(X_0 = 1) + 0 + 0 \\
&= m_0 \cdot 0.94 + m_1 \cdot 0.06 = 12.8.
\end{aligned}$$

Chapter 10.

Exercise 28. There is a mistake at the very end of the solution: the numerical value of v should correspond to the daily discount (rather than to the annual). So, $v = (0.96)^{1/365} \approx 0.99989$. In this case, $E\{Y\} \approx 8/(1 - 0.9 \cdot 0.99989) \approx 79.9137$, $E\{v^{\Psi}\} \approx 0.9989$, $E\{v^{2\Psi}\} \approx 0.9977$, and in accordance with (M-10.9), $Var\{Y\} \approx 5748.9$.

Chapter 11.

Exercise 21. $\ddot{a}_x$ in l.2 p.115 should be replaced by $\overline{a}_x$.