

Question #99**Key: B**

Model Solution:

Let S denote aggregate losses before deductible.

$$E[S] = 2 \times 2 = 4, \text{ since mean severity is } 2.$$

$$f_S(0) = \frac{e^{-2} 2^0}{0!} = 0.1353, \text{ since must have } 0 \text{ number to get aggregate losses} = 0.$$

$$f_S(1) = \left(\frac{e^{-2} 2}{1!} \right) \left(\frac{1}{3} \right) = 0.0902, \text{ since must have } 1 \text{ loss whose size is } 1 \text{ to get aggregate losses} = 1.$$

$$\begin{aligned} E(S \wedge 2) &= 0 \times f_S(0) + 1 \times f_S(1) + 2 \times (1 - f_S(0) - f_S(1)) \\ &= 0 \times 0.1353 + 1 \times 0.0902 + 2 \times (1 - 0.1353 - 0.0902) \\ &= 1.6392 \end{aligned}$$

$$\begin{aligned} E[(S - 2)_+] &= E[S] - E[S \wedge 2] \\ &= 4 - 1.6392 \\ &= 2.3608 \end{aligned}$$