

**Question #203****Answer: A**

$$\begin{aligned}\bar{a}_{30} &= \int_0^{10} e^{-0.08t} e^{-0.05t} dt + {}_{10}E_x \int_0^{\infty} e^{-0.08t} e^{-0.08t} dt \\ &= \int_0^{10} e^{-0.13t} dt + e^{-1.3} \int_0^{\infty} e^{-0.16t} dt \\ &= \left. \frac{-e^{-0.13t}}{0.13} \right|_0^{10} + \left( e^{-1.3} \right) \left. \frac{-e^{-0.16t}}{0.16} \right|_0^{\infty} \\ &= \frac{-e^{-1.3}}{0.13} + \frac{1}{0.13} + \frac{e^{-1.3}}{0.16} \\ &= 7.2992\end{aligned}$$

$$\begin{aligned}\bar{A}_{30} &= \int_0^{10} e^{-0.08t} e^{-0.05t} (0.05) dt + e^{-1.3} \int_0^{\infty} e^{-0.16t} (0.08) dt \\ &= 0.05 \left( \frac{1}{0.13} - \frac{e^{-1.3}}{0.13} \right) + (0.08) \frac{e^{-1.3}}{0.16} \\ &= 0.41606 \\ &= \bar{P}(\bar{A}_{30}) = \frac{\bar{A}_{30}}{\bar{a}_{30}} = \frac{0.41606}{7.29923} = 0.057\end{aligned}$$

$$\bar{a}_{40} = \frac{1}{0.08 + 0.08} = \frac{1}{0.16}$$

$$\begin{aligned}\bar{A}_{40} &= 1 - \delta \bar{a}_{40} \\ &= 1 - (0.08/0.16) = 0.5\end{aligned}$$

$$\begin{aligned}{}_{10}\bar{V}(\bar{A}_{40}) &= \bar{A}_{40} - \bar{P}(\bar{A}_{40}) \bar{a}_{40} \\ &= 0.5 - \frac{(0.057)}{0.16} = 0.14375\end{aligned}$$