

**Question #56****Answer: C**

$${}^2\bar{A}_x = \frac{\mu}{\mu + 2\delta} = 0.25 \rightarrow \mu = 0.04$$

$$\bar{A}_x = \frac{\mu}{\mu + \delta} = 0.4$$

$$(\bar{IA})_x = \int_0^{\infty} {}_s\bar{A}_x ds$$

$$\int_0^{\infty} {}_sE_x \bar{A}_x ds$$

$$= \int_0^{\infty} (e^{-0.1s})(0.4) ds$$

$$= (0.4) \left( \frac{-e^{-0.1s}}{0.1} \right) \Big|_0^{\infty} = \frac{0.4}{0.1} = 4$$

Alternatively, using a more fundamental formula but requiring more difficult integration.

$$\begin{aligned} (\bar{IA})_x &= \int_0^{\infty} t {}_tP_x \mu_x(t) e^{-\delta t} dt \\ &= \int_0^{\infty} t e^{-0.04t} (0.04) e^{-0.06t} dt \\ &= 0.04 \int_0^{\infty} t e^{-0.1t} dt \end{aligned}$$

(integration by parts, not shown)

$$\begin{aligned} &= 0.04 \left( \frac{-t}{0.1} - \frac{1}{0.01} \right) e^{-0.1t} \Big|_0^{\infty} \\ &= \frac{0.04}{0.01} = 4 \end{aligned}$$