

Question #174

Answer: C

Let P denote the gross premium.

$$P = \bar{a}_x = \int_0^{\infty} e^{-\delta t} e^{-\mu t} dt = \int_0^{\infty} e^{-0.05t} dt = 20$$

$$E[L] = \bar{a}_x^{IMP} - P$$

$$\bar{a}_x^{IMP} = \int_0^{10} e^{-0.03t} e^{-0.02t} dt + e^{-0.03(10)} e^{-0.02(10)} \int_0^{\infty} e^{-0.03t} e^{-0.01t} dt$$

$$= \frac{1 - e^{-0.5}}{0.05} + \frac{e^{-0.5}}{0.04} = 23$$

$$E[L] = 23 - 20 = 3$$

$$\frac{E[L]}{P} = \frac{3}{20} = 15\%$$