Question #45
Answer: E

For the given life table function: $\mathring{e}_x = \frac{\omega - x}{2}$

$$ {}_{k|}q_x = \frac{1}{\omega - x} $$

$$ A_x = \sum_{k=b}^{\omega-x-1} v^{k+1} \, {}_{k|}q_x = \frac{1}{\omega - x} \sum_{k=b}^{\omega-x-1} v^{k+1} $$

$$ A_x = \frac{a_{\overline{\omega-x}|}}{\omega - x} $$

$$ \ddot{a}_x = \frac{1 - A_x}{d} $$

$\mathring{e}_{50} = 25 \Rightarrow \omega = 100$ for typical annuitants

$\mathring{e}_y = 15 \Rightarrow y =$ Assumed age = 70

$A_{70} = \frac{a_{\overline{30}|}}{30} = 0.45883$

$\ddot{a}_{70} = 9.5607$

$500000 = b\,\ddot{a}_{20} \Rightarrow b = 52,297$