Question #233
Answer: B

$$p_{xx} = 1 - q_{xx} = 0.96$$

$$p_x = \sqrt{0.96} = 0.9798$$

$$p_{x+1:x+1} = 1 - q_{x+1:x+1} = 0.99$$

$$p_{x+1} = \sqrt{0.99} = 0.995$$

$$\ddot{a}_x = 1 + vp_x + v^2 \times {}_2p_x = 1 + \frac{0.9798}{1.05} + \frac{(0.9798)(0.995)}{1.05^2}$$
$$= 2.8174$$

$$\ddot{a}_{xx} = 1 + vp_{xx} + v^2 \times {}_2p_{xx} = 1 + \frac{0.96}{1.05} + \frac{(0.96)(0.99)}{1.05^2} = 2.7763$$

EPV = $2000\,\ddot{a}_x + 2000\,\ddot{a}_x + 6000\,\ddot{a}_{xx}$
$= (4000)(2.8174) + (6000)(2.7763)$
$= 27{,}927$

Notes: The solution assumes that the future lifetimes are identically distributed. The precise description of the benefit would be a special 3-year temporary life annuity-due.