

### Question #160

Answer: C

At any age,  $p'_x{}^{(1)} = e^{-0.02} = 0.9802$

$q'_x{}^{(1)} = 1 - 0.9802 = 0.0198$ , which is also  $q_x^{(1)}$ , since decrement 2 occurs only at the end of the year.

Expected present value (EPV) at the start of each year for that year's death benefits

$$= 10,000 * 0.0198 \quad v = 188.1$$

$$p_x^{(\tau)} = 0.9802 * 0.96 = 0.9410$$

$$E_x = p_x^{(\tau)} v = 0.941 \quad v = 0.941 * 0.95 = 0.8940$$

$$\text{EPV of death benefit for 3 years } 188.1 + E_{40} * 188.1 + E_{40} * E_{41} * 188.1 = 506.60$$