

Question #283

Answer: A

Note that this is the same as Question 33, but using multi-state notation rather than multiple-decrement notation.

The only way to be in State 2 one year from now is to stay in State 0 and then make a single transition to State 2 during the year.

$$p_x^{02} = \int_0^1 {}_t p_x^{00} \mu_{x+t}^{02} dt = \int_0^1 e^{-(0.3+0.5+0.7)t} 0.5 dt = 0.5 \frac{e^{-1.5t}}{-1.5} \Big|_0^1 = \frac{1}{3} (1 - e^{-1.5}) = 0.259$$