

Question #234**Answer: B**

$${}_t p_x^{(1)} \mu_x^{(1)}(t) = q_x^{(1)} = 0.20$$

$${}_t p_x^{(2)} = 1 - tq_x^{(2)} = 1 - 0.08t$$

$${}_t p_x^{(3)} = 1 - tq_x^{(3)} = 1 - 0.125t$$

$$q_x^{(1)} = \int_0^1 {}_t p_x^{(2)} {}_t p_x^{(3)} {}_t p_x^{(1)} \mu_{x+t}^{(1)} dt = \int_0^1 {}_t p_x^{(2)} {}_t p_x^{(3)} {}_t p_x^{(1)} \mu_{x+t}^{(1)} dt$$

$$= \int_0^1 (1 - 0.08t)(1 - 0.125t)(0.20) dt$$

$$= 0.2 \int_0^1 (1 - 0.205t + 0.01t^2) dt$$

$$= 0.2 \left[t - \frac{0.205t^2}{2} + \frac{0.01t^3}{3} \right]_0^1$$

$$= (0.2) \left[1 - 0.1025 + \frac{0.01}{3} \right] = 0.1802$$