

Question #5

Answer: B

$$\mu_x^{(\tau)} = \mu_x^{(1)} + \mu_x^{(2)} + \mu_x^{(3)} = 0.0001045$$

$${}_t p_x^{(\tau)} = e^{-0.0001045t}$$

$$\text{APV Benefits} = \int_0^{\infty} e^{-\delta t} 1,000,000 {}_t p_x^{(\tau)} \mu_x^{(1)} dt$$

$$+ \int_0^{\infty} e^{-\delta t} 500,000 {}_t p_x^{(\tau)} \mu_x^{(2)} dt$$

$$+ \int_0^{\infty} e^{-\delta t} 200,000 {}_t p_x^{(\tau)} \mu_x^{(3)} dt$$

$$= \frac{1,000,000}{2,000,000} \int_0^{\infty} e^{-0.0601045t} dt + \frac{500,000}{250,000} \int_0^{\infty} e^{-0.0601045t} dt + \frac{250,000}{10,000} \int_0^{\infty} e^{-0.0601045t} dt$$

$$= 27.5(16.6377) = 457.54$$