Problem MLC #5

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

$${}_tp_x^{(\tau)} = e^{-\mu^{(\tau)} \cdot t}$$

$$\text{Single Premium} = \text{APV Benefits} = \int_0^\infty B_t^{(1)} \cdot v^t \cdot {}_tp_x^{(\tau)} \cdot \mu_{x+t}^{(1)} \, dt$$

$$+ \int_0^\infty B_t^{(2)} \cdot v^t \cdot {}_tp_x^{(\tau)} \cdot \mu_{x+t}^{(2)} \, dt$$

$$+ \int_0^\infty B_t^{(3)} \cdot v^t \cdot {}_tp_x^{(\tau)} \cdot \mu_{x+t}^{(3)} \, dt$$

$$= \int_0^\infty 1{,}000{,}000 \cdot e^{-\delta t} \cdot e^{-\mu^{(\tau)} \cdot t} \cdot \frac{1}{2{,}000{,}000} \, dt$$

$$+ \int_0^\infty 500{,}000 \cdot e^{-\delta t} \cdot e^{-\mu^{(\tau)} \cdot t} \cdot \frac{1}{250{,}000} \, dt$$

$$+ \int_0^\infty 250{,}000 \cdot e^{-\delta t} \cdot e^{-\mu^{(\tau)} t} \cdot \frac{1}{10{,}000} \, dt$$

$$= 457.54$$

B