Question # 33
Answer: A

$$q_x^{(i)} = q_x^{(\tau)}\left[\frac{\ln\ p_x'^{(i)}}{\ln\ p_x{}^{(\tau)}}\right] = q_x^{(\tau)}\left[\frac{\ln\ e^{-\mu^{(i)}}}{\ln\ e^{-\mu^{(\tau)}}}\right]$$

$$= q_x^{(\tau)} \times \frac{\mu^{(i)}}{\mu^{(\tau)}}$$

$$\mu_x{}^{(\tau)} = \mu_x{}^{(1)} + \mu_x{}^{(2)} + \mu_x{}^{(3)} = 1.5$$

$$q_x^{(\tau)} = 1 - e^{-\mu(\tau)} = 1 - e^{-1.5}$$

=0.7769

$$q_x^{(2)} = \frac{(0.7769)\mu^{(2)}}{\mu^{(\tau)}} = \frac{(0.5)(0.7769)}{1.5}$$

$$= 0.2590$$

Question # 34
Answer: D

$${}_{2|2}A_{[60]} = v^3 \times {}_2p_{[60]} \times q_{[60]+2} +$$

↓ ↓ ↓

pay at end of year 3 | live 2 years | then die in year 3

$$+v^4 \times {}_3p_{[60]} \times q_{60+3}$$

pay at end of year 4 | live 3 years | then die in year 4

$$= \frac{1}{(1.03)^3}(1-0.09)(1-0.11)(0.13) + \frac{1}{(1.03)^4}(1-0.09)(1-0.11)(1-0.13)(0.15)$$

$$= 0.19$$