Solution # 43

Given associated single decrement assumptions

200 employees

of 40	10, 6, 8	fail to make adequate progress
of 30	6, 8, 2	resign
of 20	2, 2, 4	leave - other reasons

$q_x'^{(1)} = .25$ $\quad q_{x+1}'^{(1)} = .2$ $\quad q_{x+2}'^{(1)} = .333$

$q_x'^{(2)} = .2$ $\quad q_{x+1}'^{(2)} = .333$ $\quad q_{x+2}'^{(2)} = .125$

$q_x'^{(3)} = .1$ $\quad q_{x+1}'^{(3)} = .111$ $\quad q_{x+2}'^{(3)} = .25$

$$p_x^{(\tau)} = \prod_i p_x'^{(i)} \qquad p_x^{(\tau)} = (.75)(.8)(.9) = .54$$

$$p_{x+1}^{(\tau)} = (.8)(.667)(.889) = .4741$$

$$p_{x+2}^{(\tau)} = (.667)(.875)(.75) = .4375$$

$$q_{x+2}^{(1)} = q_{x+2}^{(\tau)} \left[\frac{\ln p_{x+2}'^{(1)}}{\ln p_{x+2}^{(\tau)}} \right]$$

$$= (1 - .4375) \left[\frac{\ln(.667)}{\ln(.4375)} \right] = .2755$$

$$= .0705$$

$$(p_x^{(\tau)})(p_{x+1}^{(\tau)})(q_{x+2}^{(1)}) = (.54)(.4741)(.2755) = .07053$$

200 employees $\Rightarrow$ $\quad 200 \times .07053 = 14.11$ **D**