Solution #306

Euler's Method $\qquad f(t+h) = f(t) + h \cdot \frac{d}{dt} f(t)$

${}_{t+h}V = {}_tV + h \cdot \frac{d}{dt}\,{}_tV$

$\frac{d}{dt}\,{}_tV = G_t - e_t + \delta_t \cdot {}_tV - \mu_{x+t}(b_t + E_t - {}_tV)$

${}_{4.5}V' = 25 + .05({}_{4.5}V) - (.02)(4.5)(100 - {}_{4.5}V)$

$= 16 + .14({}_{4.5}V)$

${}_5V = {}_{4.5}V + (.5)({}_{4.5}V') \qquad {}_5V = 100$

$100 = {}_{4.5}V + .5[16 + .14({}_{4.5}V)] = 1.07\,{}_{4.5}V + 8$

$92 = 1.07\,{}_{4.5}V = \frac{92}{1.07} \approx 85.9813 = {}_{4.5}V$

${}_4V' = 25 + .05({}_4V) - (.02)(4)(100 - {}_4V)$

$= 17 + .13({}_4V)$

$85.9813 = {}_4V + .5[17 - .13({}_4V)] = 1.065\,{}_4V + 8.5$

$77.4813 = 1.065\,{}_4V$

${}_4V \approx 72.7524 \approx 72.8$ $\boxed{E}$