Question #247
Answer: C

EPV (expected present value) of benefits = 3499 (given)

EPV of premiums $= G + (0.9)(G)v$

$$= G + \frac{0.9G}{1.05} = 1.8571G$$

EPV of expenses, except settlement expenses,

$$= [25 + (4.5)(10) + 0.2G] + (0.9)[10 + (1.5)(10) + 0.1G]v + (0.9)(0.85)[10 + (1.5)(10)]v^2$$

$$= 70 + 0.2G + \frac{0.9(25 + 0.1G)}{1.05} + \frac{0.765(25)}{1.05^2}$$

=108.78+0.2857G

Settlement expenses are $20+(1)(10)=30$, payable at the same time the death benefit is paid.

So EPV of settlement expenses $=\left(\frac{30}{10{,}000}\right)$ EPV of benefits

$$=(0.003)(3499)$$
$$=10.50$$

Equivalence principle:

$$1.8571G = 3499 + 108.78 + 0.2857G + 10.50$$
$$G = \frac{3618.28}{1.8571 - 0.2857} = 2302.59$$