

**MATH 3631 - Actuarial Mathematics II**  
**Spring 2018 - Valdez**  
**Quiz No. 5**  
**Wednesday, 7 March 2018**

Name: EMIL

Student ID: Suggested Solution

For a fully discrete whole life insurance of  $B$  issued to  $(40)$ , you are given:

- Expenses, incurred at the beginning of each year, consist of:
  - 10 in the first year and 2 in subsequent years, plus
  - 5% of the premium in the first year and 1% of the premiums in subsequent years. — G
- The annual gross premium, determined according to the equivalence principle, is 55.30.
- The annual net premium, determined according to the equivalence principle, is 52.15. — P
- $\ddot{a}_{40} = 16.2$
- $\ddot{a}_{50} = 15.1$

$$e1 = G - P = 55.30 - 52.15 = 3.15$$

Calculate the deferred acquisition cost (DAC) at the end of year 10.

$$\begin{aligned} \text{DAC}_{10} &= \text{APV}(FE_{10}) - \text{APV}(Fe_{10}) \\ &= (101G + 2) \ddot{a}_{50} - e1 * \ddot{a}_{50} \\ &= (101(55.30) + 2) (15.1) - 3.15 (15.1) \\ &= \underline{\underline{-9.0147}} \end{aligned}$$