

MATH 3630 - Actuarial Mathematics I
Fall 2016 - Valdez
Quiz No. 7
Wednesday, 16 November 2016

Name: EMIL VALDEZ Student ID: Suggested Solution

For a 20-year temporary life annuity-due issued to (70), you are given:

- $q_{70+t} = 0.02$, for $t \geq 0$
- $i = 0.05$

Let Y be the present value random variable for this temporary life annuity-due.

Calculate $E[Y]$.

$$\begin{aligned} E[Y] &= \ddot{a}_{70:\overline{20}|} = \sum_{k=0}^{19} v^k {}_k p_{70} \\ &= \sum_{k=0}^{19} \left(\frac{1}{1.05}\right)^k (0.98)^k \\ &= \sum_{k=0}^{19} \left(\frac{0.98}{1.05}\right)^k \\ &= \frac{1 - \left(\frac{0.98}{1.05}\right)^{20}}{1 - \frac{0.98}{1.05}} \\ &= \underline{\underline{11.22578}} \end{aligned}$$