

Name: KEY Quiz Score: /20

Quiz 4: Thursday, October 30, 2014

Write the symbol, the formula, and your work. No credit for answers without sufficient justification. Use standard mathematical notation correctly.

1. For each of the following, state what it represents in plain English and then give the formula (in terms of an integral or a summation).

(a) $\bar{A}_x = \int_0^{\infty} e^{-st} {}_tP_x \mu_{x+t} dt$

This is the actuarial present value of the whole life benefit payment of \$1, payable immediately upon death of the insured, whenever that death occurs.

(b) $A_{x:\overline{n}|}^1 = \sum_{k=0}^{n-1} v^{k+1} {}_kq_x$

This is the actuarial present value of an n-year term benefit payment of \$1, payable at the end of the year of death, provided the death occurs during the n-year term.

2. Compute each of the following given an effective interest rate of 4% per year and the following life table excerpt.

x	l_x	A_x
35	100,000.00	0.151375
36	99,737.15	0.158245
37	99,455.91	0.165386
38	99,154.72	0.172804
39	98,831.91	0.180505
40	98,485.68	0.188492

(a) ${}_5E_{35} = v^5 {}_5P_{35}$
 $= 1.04^{-5} \frac{l_{40}}{l_{35}}$
 $= 1.04^{-5} \frac{98,485.68}{100,000.00} \approx 0.809480 \dots$

(b) ${}_5|A_{35} = {}_5E_{35} A_{35+5} \approx (0.809480 \dots) \cdot A_{40}$
 $\approx (0.809480 \dots) (0.188492)$
 $\approx 0.152580598 \dots$