MAP 4176 / 5178 Name:_____
Test 2 Date: January 25, 2017

Show all work for full credit, use correct notation., and clearly mark your answer.

1. Using ILT assumptions determine
(a) (10 points) the expected present value for a whole-life insurance of 1000 issued to independent lives, ages 30 and 40, with benefit payable at the end of the year of the first death.

(b) (10 points) the variance of the present value random variable for the insurance in part (a)

2. For a discrete whole life insurance issued to (40), you are given:

(i) The death benefit in the first year is 1000 and increases by 1% each year.

(ii) Mortality follows the Illustrative Life Table

(iii) $i = 0.0706$

Determine the expected present value of the death benefit.

3. For a discrete whole life insurance on (65), you are given:

   (i) The death benefit in the first year is 10,000 and increases by 1,000 each year.
   (ii) $A_{65} = 0.42898$
   (iii) $(IA)_{65} = 6.16761$

   Determine the actuarial present value of the insurance benefit.

4. For a special discrete 2-year term insurance issued to (x), you are given:

   (i) The death benefit is 100,000 in the first year and 150,000 in the second year.
   (ii) The insurer is considering adding a double indemnity clause which, if adopted, will double the death benefit if death occurs by accident.
   (iii) Decrement 1 is death by accident, and decrement 2 is death by non-accident.
   (iv) $q_{x+n}^{(j)} = 0.01 \cdot j \cdot (n+1)$ for $n = 0,1$ and $j = 1,2$
   (v) $v = 0.95$

   Determine the increase in the net single premium if the double indemnity clause is adopted.