

UNIVERSITY OF REGINA
DEPARTMENT OF MATHEMATICS & STATISTICS
ACSC 317

ASSIGNMENT #2

MR. LARRY MILLER

Answers to be marked must be handed in by 1:00 p.m. on September 28, 2017. Be neat so your work can be read and marked. Identify yourself by name and student number on each page. Fasten pages together in your own self interest.

(3)

✓

For a deferred temporary life annuity on (57), you are given:

- (i) $\mu = 0.04$
- (ii) $\delta = 0.06$
- (iii) The premiums are payable continuously for the first two years at the rate of \bar{P} .
- (iv) Annuity benefits are paid at the beginning of the year.
- (v) The following annuity payment schedule:

Year	1	2	3	4	5	6	7	8	9 and later
Annuity benefit	0	0	0	10	8	6	4	2	0

Calculate the reserve at the end of year 3.

(3)

2.

For a fully continuous whole life insurance on (40), you are given:

- The level annual premium is 66, payable for the first 20 years.
- The death benefit is 2,000 for the first 20 years and 1,000 thereafter.
- $\delta = 0.06$
- $1,000\bar{A}_{50} = 333.33$
- $1,000\bar{A}_{50:\overline{10}|} = 197.81$
- $1,000{}_{10}E_{50} = 406.57$

$= 95.96$

Calculate ${}_{10}V$, the benefit reserve for this insurance at time 10.

(3)

✓

For a fully continuous whole life insurance of 1 on (x), you are given:

- (i) $\mu_{x+t} = \mu, t \geq 0$
- (ii) $\delta_t = \delta, t \geq 0$
- (iii) $\mu - \bar{P}(\bar{A}_x) = 0.03$
- (iv) $\delta + \bar{P}(\bar{A}_x) = 0.07$

Calculate ${}_k\bar{V}(\bar{A}_x)$.

(3)

4.

The net amount at risk at duration k is defined as the death benefit payable at the end of year k minus the k th terminal reserve.

For an annual premium 20-year endowment insurance of 1000 on (45), you are given:

Policy Year	Net Amount At Risk
2	923.80
3	884.30
17	201.00
18	112.60

The 15th year terminal reserve for a 50,000 endowment at 65 on (47) is V . Calculate V .

(3)

~~5.~~

A fully discrete whole life insurance is issued to (x) . You are given:

- (i) $P_x = \frac{4}{11}$
- (ii) ${}_tV_x = 0.5$
- (iii) $\ddot{a}_{x+t} = 1.1$

Calculate i .

(3)

~~6.~~

65.

A fully-discrete whole life insurance of 1 is issued to (25) . Premiums are paid annually to age the net premium during the first 10 years is P_{25} , followed by a different level annual premium payable during the next 30 years.

You are given:

- (i) $A_{35} = 0.3$
- (ii) $P_{25} = 0.01$
- (iii) $d = 0.06$

Calculate the reserve at the end of the tenth year.

(4)

7.

For a fully continuous 20-year deferred life annuity of 1 issued to (35) , you are given:

- (i) Mortality follows de Moivre's law with $\omega = 75$.
- (ii) $i = 0$
- (iii) Premiums are payable continuously for 20 years.

4.88

Calculate the net premium reserve at the end of 10 years for this annuity.

(3)

8.

You are given:

- (i) $\ddot{a}_{x+t} = 10.0$
- (ii) ${}_tV_x = 0.100$
- (iii) ${}_{t+1}V_x = 0.127$
- (iv) $P_{x+t+1} = 0.043$

Calculate d .