10. (2.25 points)

Given the following information for a policy:

- Annual earned premium = $1,000.
- New business expected loss ratio = 60%.
- Losses expected to decrease $25 per year.
- New business expenses = $420.
- Renewal business expenses = $350.
- Probability of first renewal = 85%.
- Probability of second renewal = 90%.
- Probability of third renewal = 0%.
- Assume an annual discount rate of 3%.

a. (1.75 points)

Calculate the lifetime value of the expected total profit as a percentage of premium.

b. (0.5 point)

Identify two considerations used in the analysis in part a. above that differ from standard actuarial ratemaking techniques.

1) including fixed and variable expenses together could distort your indication

2) Including them together could cause you to undercharge small premium policies and overcharge large premium policies.

OR

1) because some expenses do not vary with premium and in order to correctly account for it, it should be fixed.

2) Also it helps better track expenses and understand expenses

Exam 5 Question #10

a.

Duration	(1)	(2)	(3)	(4)	(5)	(6)	(7)=[(1) - (2) -(3)] x (5) / (6)	PV of
	Premium	Loss	Expense	Persistency	Cumulative Persistency	Discount Factor	PV of Profit	Premium
1	$1,000	$600	420	100%	100%	1.000	-20	1,000
2	1,000	575	350	85%	85%	1.030	61.89	825.24
3	1,000	550	350	90%	76.5%	1.0609	72.11	721.09

Profit/premium = $114 / $2,546.33 = 4.477%

b. i) standard actuarial ratemaking techniques typically do not consider persistency, the likelihood of and insured renewing his policy.

ii) Standard actuarial ratemaking techniques only consider premium and losses for the period in which rates will be in effect, not over the lifetime of the insured with the insurer.

c. The most common mistakes on this part was providing the similar responses twice, only defining fixed and variable expenses.

10. Generally speaking, the candidate pool did very well on both parts of this question.

   a. When candidates did make mistakes, the most common ones were:

      1. Only calculated the lifetime value of the expected total profit but did not calculate the expected premium (the denominator for the final ratio)
      2. Didn't apply cumulative persistency to the expected premium
      3. Incorrect discounting (for example, multiplying by 0.97 in year 2 instead of dividing by 1.03)
      4. Mathematical error (with credit given for the remainder of Part A in situations where the correct answer would have been calculated without the math error)

   b. Candidates scored well on this part too, with credit was typically given for the following themes:

      1. The use of multiple policy years (i.e. "lifetime" of the policy)
      2. The use of persistency (i.e. "retention")
      3. Reflection of discounting
      4. Differences in expenses/losses for new business versus renewal business

11.

   a. Candidates needed to provide a brief description along with the characteristic they listed. Most candidates lost points for either no, or an insufficient, description of the characteristic listed. For example, a common insufficient answer is that "credit is discriminatory". Such an answer is not quite accurate, since all classification plan factors discriminate among insureds. Thus, a clarification of the nature of discrimination that causes concern is warranted. Some candidates mentioned concern that the age of homeowners relativities curve does not trend monotonically. Candidates who received credit typically mentioned lack of credibility in the youngest age group or the dissimilar direction compared to competitor relativities. However, the lack of monotonic relationship in and of itself was not accepted as a valid concern.

   b. Many candidates did not provide a description commensurate with the point value assigned. In order to receive full credit, candidates needed to briefly describe at least three reasons to support their choice. Some candidates provided reasons for choosing a variable that contradicted the concerns listed in Part A, which lost them points. Often, candidates described reasons why they wouldn't choose other variables. Points were awarded when the reason a variable wasn't selected for one variable was a valid reason to select the chosen variable. For example, if the candidate didn't select loss prevention because it is difficult to verify and they were choosing credit score (which is not difficult to verify), points were awarded. However, if a candidate said they didn't select age of homeowner because of lack of credibility and they chose loss prevention (which has an issue with credibility),