9. (2 points)

An actuary develops an overall indicated rate increase of 4.5% using the following assumptions:

- All expenses are variable.
- Total permissible loss ratio = 65%.
- Profit and contingency provision = 5%.

The actuary's manager asks that the expenses be split into fixed and variable components as follows:

- Fixed = 75% of total expenses.
- Variable = 25% of total expenses.

a. (1.25 points)

Calculate the revised overall rate indication with the new expense split suggested by the actuary's manager.

b. (0.25 point)

Briefly explain why splitting the expenses as described above results in a different indication.

c. (0.5 point)

Identify two reasons an actuary may want to split expenses into fixed and variable components.

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Exam 5 Question #9

a. $PLR = .65 = 1 - V - Q$ $V = .3 \rightarrow current\ total\ expense$

Fixed %$= .75(.3) = .225$

Variable % = .25 (.3) = .075

1.045 $= \frac{Loss\ Ratio}{.65}$ Loss ratio $= .67925$

Revised Indication $= \frac{.67925 + .225}{1 - .075 - .05} = 1.0034$

3.34% Increase

b. Splitting expenses into fixed + variable accounts for the fact that certain expenses are a set amount for each risk, regardless of premium size. Depending on ratio of fixed vs variable, indication will differ due to fixed included on top off equation added to loss ratio.

OR

Allows fixed expenses to be added in with the loss of ratio and the revised permissible loss ratio to be higher which lowers indication.

OR

Because fixed expenses are not changing with premium they are a set in stone percentage. That's why we add them to the LR rather than include it in the permissible ratio.

c. 1) Assuming all variable expenses when some are truly fixed will over charge high premium risks and under charge low premium risks.

2) Fixed expenses may be affected by trend, so separating allows us to apply trend factors to get more accurate expense load.

OR

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) Premium	(2) Loss	(3) Expense	(4) Persistency	(5) Cumulative Persistency	(6) Discount Factor	(7)=[(1) - (2) -(3)] x (5) / (6) PV of Profit	PV of 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

In both the written response and diagram, several candidates received no credit for describing the gap as happening when both the claims-made and occurrence policies were effective at the same time, rather than in a subsequent year.

As with part D, candidates did demonstrate a strong understanding of what was being asked, but some provided responses that were more involved than needed.

7. This question was a straightforward calculation. The most challenging part for candidates was the part of the question where it stated that losses given were prior to the 7/1/11 benefit change, and that all accident years needed to adjusted by the both benefit changes (the full amounts) for full credit.

   The majority of candidates missed this subtlety and approached the question by adjusting each accident year by a different amount. A common mistake among these candidates was to treat the 7/1/11 benefit change as applying to policies written on or after 7/1/11 (question stated that it applied to losses on or after) and/or treat the 10/1/12 benefit change as applying to losses on or after 10/1/12 (question stated that it was applied to policies written on or after).

   Several candidates correctly calculated the average benefit level for losses in each of the given accident years, but then multiplied the given losses by the average benefit level (rather than using the average benefit level to calculate a benefit level adjustment factor before applying).

8. Only a very small number of candidates received the full credit. One of the most popular mistakes is the incorrect trending periods. Very few candidates got it right. A significant portion of candidates missed the assumption that "All policies are annual and written on January 1" and therefore calculated the total trending period as incorrect 3.5 years. Another common mistake is the application of one step trending without any adjustment. Most candidates did not use two step trending or one step trending plus onetime adjustment to account for the underwriting guidelines change. Regarding the loss development part, most candidates got it correct. A small percentage of candidates misread the ultimate LDFs provided in the question as age-to-age factors. Almost all candidates understood the correct trend factor calculation (freq*sev) ^ trend period. They also understood the projected ultimate loss is calculated by multiply the incurred loss by the loss development factor to ultimate and trend factor. About 10% of all candidates did not attempt the question (having a blank or almost blank answer sheet).

9.

   a. Many candidates received full credit for this question. When there was an error committed, candidates either used the permissible loss ratio as the experience loss ratio or flipped the variable and fixed expense percentages.

   b. Many candidates had trouble with this question. The answer was a verbalization of part a of this question. Many didn't realize this and tried to define fixed and expense rather than stating how reflecting fixed impacted indication.

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),