9. (2.5 points)

Given the following information:

Territory	Premium	Current Relativity	Indicated Relativity
1	$195,000	0.85	0.75
2	$475,000	1.00	1.00
3	$330,000	1.30	1.20
Total	$1,000,000		

Management is requiring that <u>both</u> of the following objectives are achieved with the upcoming rate change:

- Target an overall rate level increase of 20%.
- Revise territorial relativities to the indicated relativity, while capping any territory rate impact at 25% overall.

Calculate the territorial relativities that will be implemented with the rate change.

Exam 5 – Question #9 (example 1)

Territory	Prem	Curr Rel	Proposed Rel	Prop/Curr	Rev Neutral Change
1	195,000	.85	.75	.88235	.927156
2	476,000	1.00	1.00	1.0000	1.05078
3	330,000	1.3	1.2	.923077	.96995
	1,000,000			.951674	

Wtd w prem

Territory	Target Overall chg	Total chg	Prem above cap
1	1.2	1.11259	-
2	1.2	1.260936	5,194.6
3	1.2	1.16394	-

Adj to base due to cap = 1.25/1.260936 = .991327
Prop prem territory 1 and 3 = 1.11259(195,000) + 1.16394 (330,000) = 601,055.25
Adj to territory 1 and 3 due to prem cap = 5194.6/601,055.25+1 = 1.008642
Total adj to territory 1 and 3 = 1/.991327 x 1.008642 = 1.017467

<u>Territory Adjusted Rel</u>

    1   .75 x 1017467 = .76310

    2   1.000   = 1.000

    3   1.2 x 1.017467 = 1.22096

Exam 5 – Question #9 (example 2)

Territory	(1) Prem	(2) Current Rel	(3) Proposed Rel	(4) △	(5) Rev Neutral	(6) Overall
1	195,000	.85	.75	.88	.927	1.2
2	475,000	1.0	1.0	1.0	1.05077	1.2
3	330,000	1.3	1.2	.925	.9699	1.2
Total	1,000,000			.95167		

Prem wtd avg

(4) = (3) / (2)

(5) = (4) / (4 total)

Territory	Total (7)	Beyond cap (8)	Prem cap (9)
1	1.11259	-	-
2	1.26093	1.09%	5,194.46
3	1.16394	-	-
Total			5,194.46

(10) Prem from non-cap = 601,055.5344

(11) Revised base rate factor = .9913273

(12) Revise to uncap levels = 1.008

(13) Revised factor for base rate effect = 1.0087

(14) Factor to adjust non-capped levels = 1.017

(7) = (5)(6)

(8) = (7) – 1.25

(9) = (1)(7) – (1)(1.25)

(10) = (1)(7) for territory 1 & 3

(11) = 1.25/(7) for territory 2

(12) = (9)/(10)

(13) = 1/(11)

(14) = (12) (13)

        Proposed Rels

    1   .763

    2   1.0

    3   1.22

7.

    a.   More than half of the candidates received full credit for this part. Some common mistakes were stating that both fixed and variable expenses were treated as one ratio and stating that variable expenses are related to exposures/policy counts instead of premium for the Exposure/Policy Based method.

    b.   A majority of candidates were able to correctly describe a shortcoming for the Premium Based method, while many had difficulty doing the same for the Exposure/Policy Based method. A common mistake was referencing a shortcoming of the pure premium or loss ratio methods, which aren't necessarily shortcomings of the methods for deriving expense provisions.

8.

Most candidates received full or nearly full credit. Some common errors include: incorrectly utilizing both the non-modeled and modeled CAT Pure Premiums, incorrectly applying credibility by year and not in total, incorrectly utilizing the ULAE factor, and incorrectly using the complement of credibility. Some candidates applied the ULAE factor to provisions that already included LAE.

9.

In general, most candidates were able to correctly calculate the weighted impact of the proposed relativity changes and recognize the need for an off-balance in order to neutralize the overall premium back to the starting premium. Most candidates were also able to then apply the targeted rate change of 20% in order to derive a total uncapped change for each territory.

Some candidates only showed that territory 2 would exceed the maximum rate cap of 25% without explicitly demonstrating that territories 1 and 3 would *not*. When attempting to calculate the premium shortfall due to the cap on territory 2, some candidates failed to identify the correct premium to which the excess ratio should be applied. Another common error involved candidates capping the rate change at the overall targeted change of 20%. Most candidates struggled with the final step of the calculation – either by not correctly identifying the denominator of premiums to which the excess premium should be applied or by forgetting to make an adjustment to compensate for the base rate cap.

10.

    a.   Most candidates received full credit. When candidates did lose points they correctly identified key ideas regarding exposure distributions or correlation of variables but misstated the concept in some way.

    b.   Most candidates received full credit. Most common mistakes for this calculation were: using the Loss Ratio method instead of Pure Premium or incorporating the current relativities, possible typos/miscalculations with no work shown.