17. (3.5 points)

Given the following information as of December 31, 2017:

Calendar Year	Earned Premium ($000)	On-Level Adjustment
2014	127,500	0.710
2015	117,600	0.660
2016	64,300	0.850
2017	58,900	1.000

Accident Year	Ultimate Claim Counts	Ultimate Severity ($)
2014	2,200	32,600
2015	1,970	35,300

-1.3%	Annual claim count trend
6.0%	Annual severity trend
15%	Estimated savings on claims occurring after January 1, 2017 due to legislative change

a. (3 points)

Estimate the ultimate claims for accident years 2016 and 2017 using an appropriate frequency-severity technique.

b. (0.5 point)

Briefly describe two key assumptions of frequency-severity techniques.

CONTINUED ON NEXT PAGE

QUESTION 17

TOTAL POINT VALUE: 3.5 | **LEARNING OBJECTIVE(S): B3, B5**

SAMPLE ANSWERS

Part a: 3 points

AY	Ult Claim Counts	Trend to 2017	Trended Ult Counts	Earned Premium	On-Level Adjustment	On-Level Premium	Trended Ult Freq
2014	2200	0.962	2115	127,500	0.71	90,525	2.34%
2015	1,970	0.974	1919	117,600	0.66	77,616	2.47%
Average							2.4%
Selected							2.4%
Estimated 2016 (adjusted for OLEP and detrended)					0.024 / (0.987 * .85) = 2.07%		

Projection of Ult. Severity

AY	Ult Severity	Trend to 2017	On-Level Adjustment	Trended Ult Freq
2014	32,600	1.19	0.85	33,003
2015	35,300	1.12	0.85	33,714
Average				33,358
Selected				33,358
Estimated 2016 Severity (reverse tort factor adj and detrend)			33,358 / (1.06 * 0.85) = 37,024	

AY	Earned Premium	Selected Freq	Ultimate Claims	Selected Severity	Ult. Claims
2016	64,300	2.07%	1332	37024	49,300
2017	58,900	2.40%	1416	33358	47,247

Addtional

Graders also gave full credit to severity selections equal to 2015 or 2014 instead of the average or to algebraically equivalent answers including selecting values trended to 2016 and trending the selection to 2017 instead of selecting values trended to 2017 and detrending to 2016.

Part b: 0.5 point

Any two of the following:

- Claim counts develop similarly in future
- Claim counts consistent over time
- Mix by claim type consistent / homogeneous
- Consistent definition of exposures
- Stable settlement pattern

- Stable case reserve adequacy
- Frequency/severity consistent in future

EXAMINER'S REPORT

Candidates were expected to calculate ultimate claims using the frequency / severity technique incorporating trend and discuss assumptions of frequency / severity techniques.

Part a

Candidates were expected to use the frequency /severity technique incorporating trend to calculate ultimate claims. Candidates were expected to trend the data from different accident years consistently, separately for frequency and severity. Then, provided a new exposure base for years 2016 and 2017, candidate were expected to estimate the total ultimate claims for each. Candidates were expected to apply frequency trend, severity trend, adjust for a change in premium per exposure, and apply an adjustment for a change in the tort environment.

Candidates were expected to calculate frequency by adjusting for the change in on-level premium. Next, candidates were expected to apply trend separately to the frequency and severities, individually for each accident year. Frequencies and severities could be trended to either 2016 or 2017 values. Selected frequency and severity were then detrended to 2016 (or trended to 2017 if selections were made at 2016 levels). The candidates were expected to apply the tort factor for the 2017 losses only. Lastly, candidates were expected to multiply selected frequency by premiums, resulting in ultimate claims counts and multiply these ultimate claim counts by selected ultimate severity to arrive at the ultimate claims estimate.

Common mistakes include:

- Failing to convert claim counts to frequency
- Incorrectly applying the on-level factors or applying them inconsistently
- Not applying the tort factor, applying it to both years, or applying it to 2016 only.
- Multiplying the calculated frequency and severity together, but not multiplying by premium (exposure).
- Attempting to calculate a loss ratio
- Averaging the 2014 and 2015 data without individually trending them

Part b

Candidates were expected to describe two key assumptions of the frequency / severity technique.

Common mistakes include:

- Providing a generic answer regarding the availability or accuracy of data.
- Providing a specific required definition of claim count. The assumption of the frequency / severity technique is that the definition of a claim count is *consistent*, but there are alternate valid ways to define claim counts.