5. (2 points)

Given the following information for an insurance company as of December 31, 2016:

Accident Year	Earned Premium ($000)	Reported Loss ($000)	Cumulative Loss Development Factors
2012	3,000	1,500	1.05
2013	3,500	1,925	1.10
2014	3,300	1,749	1.20
2015	3,200	1,984	1.35
2016	3,800	2,470	1.40

- All policies are annual.
- Annual loss cost trend = 3%.
- The company has increased rates by 5% every year on January 1.
- The company writes policies uniformly throughout the year.

Calculate accident year 2016 trended ultimate loss using the Bornhuetter-Ferguson method with the expected loss ratio based on accident years 2012 through 2014 experience.

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QUESTION 5

TOTAL POINT VALUE: 2 | **LEARNING OBJECTIVE(S): A2, A3, B3**

SAMPLE ANSWERS

Sample 1

Accident Year	Trended Ult Reported Loss
2012	$1,500 * 1.05 * 1.03^4 = 1,772.676$
2013	$1,925 * 1.1 * 1.03^3 = 2,313.849$
2014	$1,749 * 1.2 * 1.03^2 = 2,226.617$
Total	6,313.142

Accident Year	Earned Premium	CRLF	OLEP
2012	3,000	1.05^4	3,646.52
2013	3,500	1.05^3	4,051.69
2014	3,300	1.05^2	3,638.25

Accident Year	Loss Ratio
2012	48.6%
2013	57.1%
2014	61.2%
All Year Avg	55.6%

BF formula:
2,470 + 55.6% * 3,800 * (1-1/1.4) = 3,074.1

Sample 2

Accident Year	Trended Ult Reported Loss
2012	$1,500 * 1.05 * 1.03^4 = 1,772.676$
2013	$1,925 * 1.1 * 1.03^3 = 2,313.849$
2014	$1,749 * 1.2 * 1.03^2 = 2,226.617$
Total	6,313.142

Accident Year	Avg. Rate Level	On-level Factor	On-level EP
2012	$0.5 * 1.0 + 0.5 * 1.05$	1.24515	3,735.45
2013	$0.5 * 1.05 + 0.5 * 1.05^2$	1.18586	4,150.51
2014	$0.5 * 1.05^2 + 0.5 * 1.05^3$	1.12939	3,726.98
2015	$0.5 * 1.05^3 + 0.5 * 1.05^4$	1.07561	3,441.952
2016	$0.5 * 1.05^4 + 0.5 * 1.05^5$	1.02439	3,892.682
	Current Rate Level = 1.05^5	Total '12-'14	11,612.947

ECR = 6,313.142/11,612.947 = .5436

BF formula:
2,470 + .5436 * 3,892.682 * (1 – 1/1.4) = 3,074.589

Sample 3

Accident Year	Earned Premium	CRLF	OLEP	Loss	CDF	Trend	Ult Loss	Loss Ratio
2012	3,000	1.2452	3,735.46	1,500	1.05	1.03^4	1,772.68	0.47455
2013	3,500	1.1859	4,150.51	1,925	1.1	1.03^3	2,318.85	0.5587
2014	3,300	1.294	3,726.99	1,745	1.2	1.03^2	2,226.62	0.59743
			11,612.96				6,313.14	.54363

BF Formula:
2,470 + 3,800 * .54363 * (1 – 1/1.4) = 3,060.22

EXAMINER'S REPORT

Candidates were expected to understand how to develop losses to ultimate, on-level premium, and trend losses to the appropriate time period. Answers that either brought premium to the *current* 2016 rate level or the *average* 2016 rate level were both awarded credit.

Additionally, candidates were expected to select a loss ratio and apply the Bornhuetter-Ferguson method correctly. If reasoning/assumptions were stated then the candidate could select any loss ratio from accident years 2012-2014 (weighted average, straight average, exclude certain years, etc.) to apply to the BF method and receive credit.

Common errors included:

- On-leveling or trending to the wrong dates
- Not applying development factors to losses
- Only providing IBNR portion of BF calculation rather than the ultimate loss
- Selecting a loss ratio not based on 2012-2014