1. (3.5 points)

An insurance company writes annual policies. The history of rate changes is as follows:

Effective Date	Overall Rate Change
January 1, 2010	+4.2%
March 1, 2011	+0.3%
January 1, 2012	-1.7%
June 1, 2013	+1.0%

a. (1 point)

Calculate the on-level factor to current rate level for calendar year 2011 earned premium, assuming all policies are written uniformly throughout the year.

b. (2 points)

Assume that 25% of policies are written on the first day of the year and the remaining policies are written evenly throughout the year. Calculate the on-level premium factor to current rate level for policies in-force on February 1, 2012.

c. (0.5 point)

Assuming all policies are written uniformly throughout the year, and without performing additional calculations, discuss the effect on the on-level premium factor for calendar year 2011 if the policy term was 2 years instead of annual.

CONTINUED ON NEXT PAGE

EXAM 5 SPRING 2014 SAMPLE ANSWERS AND EXAMINER'S REPORT

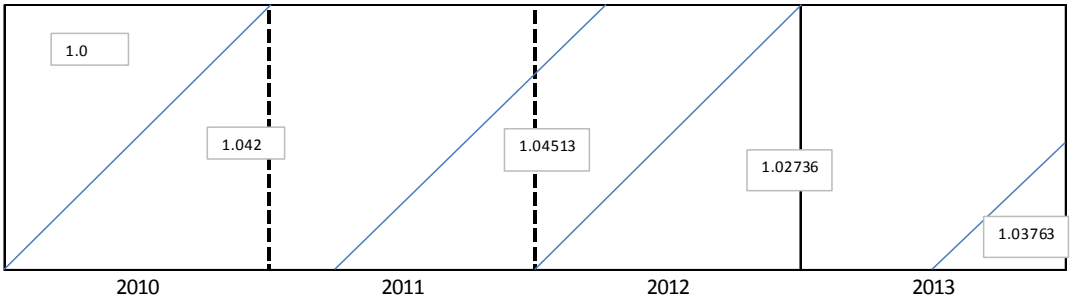
QUESTION: 1

TOTAL POINT VALUE: 3.5

LEARNING OBJECTIVE(S): A3

SAMPLE/ACCEPTED ANSWERS:

Part a: 1 point



OLF for CY 2011 Earned Premium

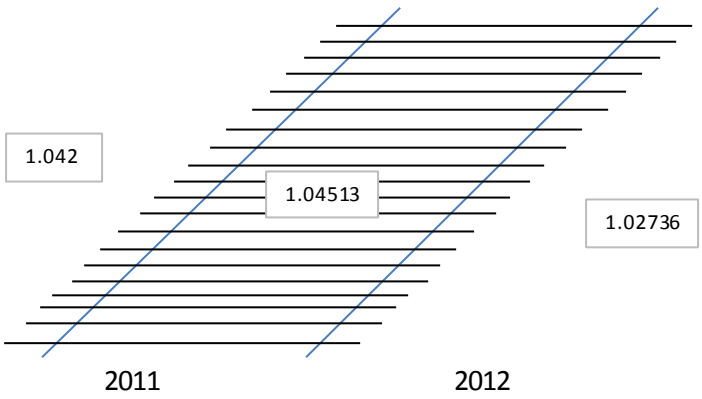
$$= \frac{1.03763}{(5/6)(5/6)(1/2)(1.04513)+(1-25/72)(1.042)}$$

$$= 1.03763/1.04309$$

$$= 0.99477$$

*Candidates may ignore the +4.2% rate change that exists in both the numerator and denominator and still receive full credit.

Part b: 2 points



OLF for Inforce policies on Feb 1, 2012

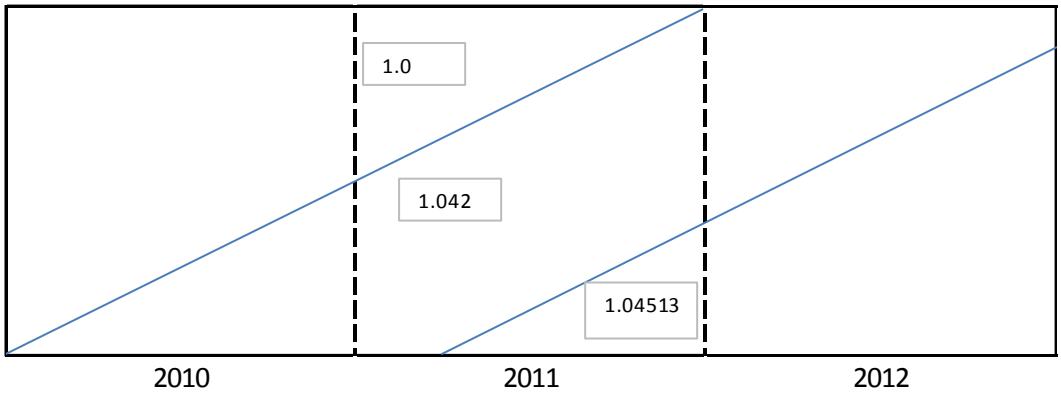
$$= \frac{1.03763}{(0.75)(1/12)(1.042)+(10/12)(0.75)(1.04513)+0.25(1.02736)+(0.75)(1/12)(1.02736)}$$

$$= 1.03763/1.03938$$

$$= 0.99832$$

*Candidates may ignore the +4.2% rate change that exists in both the numerator and denominator and still receive full credit.

Part c: 0.5 point



The portion of "1" comes in and the portion of 1.04513 decreases. Thus the OLF increases.

EXAMINER'S REPORT:

General Commentary

- Candidates were expected to be able to calculate on-level factors to re-state various premiums at the current rate level, using the parallelogram method. This includes calculations for calendar year premium and in-force premium, and also incorporating special earning patterns.
- Overall, candidates performed as expected on this question. While most candidates scored at least 1/3 of the possible points, there was a fairly even distribution of scores between 1/3 of the credit and full credit.
- Part b. required the candidates to incorporate special earning patterns and the use of in-force premium rather than a calendar year premium. A large number of candidates struggled to incorporate the special earning pattern (25% of policies written on January 1st). A large number of candidates struggled to calculate the average rate level for in-force premium. Some candidates, rather than calculating an on-level factor using average rate levels, attempted to multiply the premiums by the rate changes that have not yet been fully earned.

EXAM 5 SPRING 2014 SAMPLE ANSWERS AND EXAMINER'S REPORT

Part a

- Candidates were expected to be able to calculate on-level factors to re-state calendar year premium at the current rate level, using the parallelogram method.
- Candidates were expected to be able to use the parallelogram method to calculate weights of different rate levels earned in a calendar year, and use them to calculate the on-level factor necessary to re-state the calendar year premium at the current rate level.
- The most common errors in part a. were assuming the March 1st rate change was ¼ of the way through the year, and calculation errors.

Part b

- Candidates were expected to be able to calculate on-level factors to re-state in-force premium at the current rate level, using the parallelogram method. This includes calculation to incorporate a special earning pattern.
- Candidates were expected to be able to use the parallelogram method to calculate weights of different rate levels for in-force premium (including the special earning pattern), and use them to calculate the on-level factor necessary to re-state the in-force premium at the current rate level.
- A large number of candidates struggled to incorporate the special earning pattern (25% of policies written on January 1st). A large number of candidates struggled to calculate the average rate level for in-force premium. Some candidates, rather than calculating an on-level factor using average rate levels, attempted to multiply the premiums by the rate changes that have not yet been fully earned.

Part c

- Candidates were expected to be able to articulate how a change to the policy term (2-year policies vs. annual) would change the on-level factor without performing additional calculations.
- Candidates were expected to state that the on-level factor would increase and give correct rationale as to why (the average rate level in 2011 would decrease).
- The most common error made in part c was that candidates ignored the impact of the 1/1/2010 rate change (+4.2%). Occasionally, candidates erroneously responded about future rate changes having an impact.