3. (1.5 points)

Given the following for an insurance company that writes only annual policies:

Policy	Effective Date	Annual Premium
A	July 1, 2014	$200
B	October 1, 2014	$240
C	January 1, 2015	$260
D	July 1, 2015	$280

- Policy D was cancelled March 31, 2016.

a. (0.5 point)

Calculate the following for calendar year 2015:

i. Earned premium
ii. Written premium

b. (0.5 point)

Calculate the following as of December 31, 2016:

i. Policy year 2015 earned premium
ii. Policy year 2015 written premium

c. (0.5 point)

Briefly describe one advantage and one disadvantage of calendar year data aggregation.

QUESTION 3	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): A2**
SAMPLE ANSWERS	

Part a: 0.5 point

Sample 1
   i) Calendar Year 2015 EP = 200 x (6/12) + 240 x (9/12) + 260 x (12/12) + 280 x (6/12) = $680
   ii) Calendar Year 2015 WP = 260 x (12/12) + 280 x (12/12) = $540

Sample 2
   i) Calendar Year 2015 EP = 200 x (.5) + 240 x (.75) + 260 x (1) + 280 x (.5) = $680
   ii) Calendar Year 2015 WP = 260 + 280 = $540

Part b: 0.5 point

Sample 1
   i)   Policy Year 2015 EP = 260 + 280 x (.75) = $470
   ii)   Policy Year 2015 WP = 260 + 280 x (.75) = $470

Sample 2
   i)   Policy Year 2015 EP = 260 + 280 x (9/12) = $470
   ii)   Because it is as of 31/12/2016, premium is fully developed and
             Policy Year 2015 EP = Policy Year 2015 WP = $470

Sample 3
   i)   Policy Year 2015 EP = 260 + 280 x (1-3/12) = $470
   ii)   Assuming no premium audit:
             Policy Year 2015 EP = Policy Year 2015 WP = $470

Part c: 0.5 point

Any one of the following sample responses for advantages
- Premium and losses are fixed at the end of the calendar year
- Calendar year data will not develop into the future
- Once the calendar year is over, data is ready to be used
- CY aggregation does not have any development which makes it easy to use for the financial statements and other year-end statements
- Premium and losses are readily available
- Data is fixed at the end of the year so there is no uncertainty in the values. There is nothing to estimate once the year is over
- There is no report lag in calendar year aggregation
- Easy to obtain since it is needed for financial statement
- Data can be reconciled easily with financial data
- This information is typically collected for other financial reporting so it represents no additional expense to aggregate the data this way for ratemaking purposes

Any one of the following sample responses for disadvantages
- Calendar year data aggregation has a poor match of claims to premium
- Mismatch between premium and losses
- CY data does a poor job of estimating true loss and premium information as it does not develop
- It is not as accurate as policy year. If a policy cancels, it will not show in the financials until the calendar year report of the year of the cancellation
- Should not be used when there is shift in business such as shift in deductibles
- No development since it is fixed at the end of the period so cannot be used to calculate IBNR
- Because there is no development of CY data, it is not useful for developing ultimate claims estimate
- Calendar year data aggregation cannot reflect the true experience of premium earned and loss occurrence
- Mismatch in timing between premium and losses

EXAMINER'S REPORT

Candidates were expected to demonstrate knowledge of definitions and differences of the aggregation methods (calendar year, policy year, accident year), and how to calculate written premium vs earned premium

Part a

Candidates were expected to be able to calculate the EP and WP under the calendar year aggregation method

Common errors included:
- Calculating only one of the two (EP or WP) properly
- Excluding policy A ($200 x 6/12) in the calculation of the EP

Part b

Candidates were expected to be able to calculate the EP and WP under the policy year aggregation method

Common errors included:
- Miscalculating the number of months cancelled under policy D for both the calculation of the EP and WP
  e.g. Policy Year 2015 EP = 260 + 280 x (10/12) = $493
       Policy Year 2015 WP = 260 + 280 x (10/12) = $493
- Not recognizing that the WP and EP should be equal
- Calculating the EP and WP incorrectly

Part c

Candidates were expected to be able to demonstrate their understanding of the calendar year and policy year method by stating one advantage and one disadvantage of the CY method

Common incorrect responses for the advantage included:
- Easy to compare with losses
- Uses most recent data [more details were expected to prove understanding]
- Easy to use [more details were expected to prove understanding]
- Calendar year is not so commonly used in the industry, so many benchmarks are not used/useful in CY aggregation
- Development doesn't take as long as underwriting aggregation [the data doesn't develop faster – the method just ignores the development of the data written in the calendar year]
- There is no development beyond 12 months so no need to develop [there is no 12 months of development for all policy written in the calendar year]
- May not be accurate reflection of the actual data [more details were expected to prove understanding]
- Calendar year data does not develop [more details were expected to prove understanding]
- The data was developing faster

Common incorrect responses for the disadvantage included:
- Takes longer to become available
- May not be accurate reflection of the actual data [more details were expected to prove understanding]
- Calendar year data does not develop [more details were expected to show understanding]
- Loss data at the calendar year level is not correlated with exposures
- It can't reflect policies losses results since CY policies consist of all in-force policies and there is a large report lag of claims [candidates were expected to know the difference between earned, written and in force policies]