19. (3.25 points)

Given the following information evaluated as of December 31, 2016:

Accident	Cumulative Paid Claims ($000) as of (months)			
Year	12	24	36	48
2013	1,000	2,000	3,100	3,410
2014	1,500	3,300	4,785	
2015	2,000	3,600		
2016	2,500			

Accident	Cumulative Reported Claims ($000) as of (months)			
Year	12	24	36	48
2013	3,000	3,600	3,960	4,000
2014	4,200	5,250	5,775	
2015	5,100	6,630		
2016	7,500			

Accident	Case Outstanding ($000) as of (months)			
Year	12	24	36	48
2013	2,000	1,600	860	590
2014	2,700	1,950	990	
2015	3,100	3,030		
2016	5,000			

a. (0.75 point)

Calculate the expected incremental reported claims for accident year 2016 in calendar year 2019 using the reported claim development technique.

b. (2 points)

Calculate the expected incremental reported claims for accident year 2016 in calendar year 2019 using the incremental paid to previous case outstanding technique.

c. (0.5 point)

Briefly describe whether the case outstanding technique is appropriate to project ultimate claims when performing an analysis on each of the following bases:

i.   Report year
ii. Accident year

QUESTION 19		
TOTAL POINT VALUE: 3.25		**LEARNING OBJECTIVE(S): B1, B3**
SAMPLE ANSWERS		
Part a: 0.75 point		

Sample 1

AY	12-24	24-36	36-48
2013	1.20	1.10	1.01
2014	1.25	1.10	
2015	1.30		
Avg	1.25	1.10	1.01
Selected	1.25	1.10	1.01

AY 2016 Cumulative Reported Claims
@12months = 7500
@24 months = 7500 x 1.25 = 9375
@36 months = 9375 x 1.10 = 10312
@48 months = 10312 x 1.01 = 10415

Incremental reported in 2019 = 10415 − 10312 = 103

Sample 2

Reported Claim
Dev

AY	12-24	24-36	36-48
2013	1.20	1.10	1.01
2014	1.25	1.10	
2015	1.30		
Avg	1.25	1.10	1.01
Selected	1.25	1.10	1.01
CDF	1.39	1.111	1.01

7500 x 1.39 − 7500 x 1.25 x 1.1 = 103

Sample 3

Reported Claim
Dev

AY	12-24	24-36	36-48
2013	1.20	1.10	1.01
2014	1.25	1.10	
2015	1.30		
Avg	1.25	1.10	1.01
Selected	1.25	1.10	1.01
CDF	1.3888	1.111	1.01

% reported @ age 36 = 99%

7500 x 1.3888 x (1-99%) = 104
Part b: 2 points

Sample 1

Case Development

AY	12-24	24-36	36-48
2013	0.800	0.538	0.686
2014	0.722	0.508	
2015	0.977		
sel	0.832	0.523	0.686

AY 2016 Case Outstanding

12	24	36	48
5000	4160	2176	1493

4160 = 5000 x .832

Incremental Paid

AY	12	24	36	48
2013	1000	1000	1100	310
2014	1500	1800	1485	
2015	2000	1600		
2016	2500			

Incremental Paid to Case Outstanding

AY	12-24	24-36	36-48
2013	0.500	0.688	0.360
2014	0.667	0.762	
2015	0.516		
sel	0.561	0.728	0.360

AY 2016 Incremental Paid

12	24	36	48
2500	2805	3028	783

2805 = 5000 x 0.561

Cumulative Paid

12	24	36	48
2500	5305	8333	9116

Cumulative Reported

12	24	36	48
7500	9465	10509	10609

Expected Incremental Reported in CY 2019 = 10609 – 10509 = 100,000

Sample 2
Using same development factors from sample 1 above.

Case Outstanding
@36 = 5000 x 0.832 x 0.523 = 2176
@48 = 2176 x 0.686 = 1493
Change in case = 1493-2176 = -683

Incremental paid
@48 = 2176 x 0.36 = 783

Incremental reported
@48 = 783 + -683 = 100

Part c: 0.5 point

Sample Responses for Report Year
- More appropriate on a reporting basis because assumes all claims known in first year
- Report year has no pure IBNR. The technique assumes there is only IBNER, thus it is appropriate.
- Case reserves set when claims reported, tracks with this technique

Sample Responses for Accident Year
- Not appropriate for immature years where not all claims have been reported.
- Appropriate if most claims are reported by the first maturity.

EXAMINER'S REPORT

Candidates were expected to understand and use the reported claims development technique and the incremental paid to previous case outstanding technique. Additionally, candidates were expected to know when those techniques are appropriate and when they are not.

Part a

Candidates were expected to know how to use the reported claims development technique given a triangle of cumulative reported claims. Candidates needed to understand how to use that triangle to project ultimate claims as well as the projected claims at immature ages.

Common errors included:
- Calculating the age-to-age factors but failing to calculate the cumulative development factors if taking an approach where cumulative factors were needed.
- Developing 2016 to ultimate but not calculating the incremental portion of that ultimate reported in calendar year 2019.

Part b

Candidates were expected to know how the incremental paid to previous case outstanding technique worked and to interpret the outputs. Candidates were expected to construct the incremental paid to case outstanding triangle, make selections, and calculate the expected incremental reported claims.

Common errors included:

• Calculating the incremental paid claims instead of the incremental reported claims.
Part c
Candidates were expected to know when the incremental paid to previous case outstanding technique was appropriate to use given different data aggregation options. Common errors included: • Discussing accident year and report year in general without any explanation of how the technique works for each of these aggregation options. • Providing an assessment without an explanation, such as "appropriate" or "not appropriate".