SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

GENERAL COMMENTS:

- Candidates should note that the instructions to the exam explicitly say to show all work; graders expect to see enough support in the candidate's response to follow the calculations performed. While the graders made every attempt to follow calculations that were not well-documented, lack of documentation may result in the deduction of points where the calculations cannot be followed or are not sufficiently supported. This concept is applicable in the TBE environment; while multiple steps of a calculation may be combined into a single cell, candidates should take care to clearly label their work to help ensure the graders understand what the candidate is attempting to calculate to maximize partial credit.
- In the TBE environment, some candidates opted to copy and paste the information provided in the question to the space available for candidate responses. This is not required to answer the question as the information in the question can be directly linked to. Some candidates who chose to do this introduced errors into their work by copying and pasting only a portion of the information, or copying and pasting incorrectly.
- Candidates should justify all selections when prompted to do so. For example, if the candidate selects an all year average and the question prompts a justification of all selections, a brief explanation should be provided for the reasoning behind this selection. Candidates should note that a restatement of a numerical selection in words is not a justification.
- Incorrect responses in one part of a question did not preclude candidates from receiving credit for correct work on subsequent parts of the question that depended upon that response.
- Candidates should try to be cognizant of the way an exam question is worded. They must look for key words such as "briefly" or "fully" within the problem. We refer candidates to the Future Fellows article from December 2009 entitled "The Importance of Adverbs" for additional information on this topic.
- Some candidates provided lengthy responses to a "briefly describe" question, which does not provide extra credit and only takes up additional time during the exam.
- Candidates should note that the sample answers provided in the sample solutions file are not an exhaustive representation of all responses given credit during grading, but rather the most common correct responses.
- In cases where a given number of items were requested (e.g., "three reasons" or "two scenarios"), the sample solutions will include multiple solutions that cumulate to more sample answers than the requested number. The additional responses are provided for educational value, and would not have resulted in any additional credit for candidates who provided more than the requested number of responses. Candidates are reminded that, per the instructions to the exam, when a specific number of items is requested, only the items adding up to that number will be graded (i.e., if two items are requested and three are provided, only the first two are graded).
- It should be noted that all exam questions have been written and graded based on information included in materials that have been directly referenced in the official syllabus, which is located on the CAS website. The CAS takes no responsibility for the content of supplementary study

materials and/or manuals produced by outside corporations and/or individuals which are not directly referenced in the official syllabus.

- Question 21 was deemed defective, as it was missing a key piece of information to solve the problem. The exam was graded excluding this question, and the available points and overall pass mark shown below excludes this question. However, any candidates that did answer the question appropriately, and who would have passed if the exam included the question but would fail with this question excluded, are included as part of the list of passing candidates.

EXAM STATISTICS:

- Available Points (makeup exam, excluding question 21): 53.5
- Passing Score (makeup exam, excluding question 21): 40.25
- Number of Candidates (original exam and make-up exam combined): 928
- Number of Passing Candidates (original exam and make-up exam combined): 557
- Raw Pass Ratio (original exam and make-up exam combined): 60.0%
- Effective Pass Ratio (original exam and make-up exam combined): 63.1%

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 1	
TOTAL POINT VALUE: 1.25	**LEARNING OBJECTIVE(S): A2**
EXAMINER'S REPORT	
Candidates were expected to demonstrate knowledge of in-force premium and policy year written premium, including audits and endorsements.	
Part a Candidates were expected to properly identify policies that were in-force as of September 15, 2015. Common errors included: • Prorating the endorsement in Policy B	
Part b	
Candidates were expected to calculate 2015 policy year written premium as of December 31, 2017. Common errors included: • Not prorating the endorsements • Incorrectly accounting for the cancelled Policy C	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 2	
TOTAL POINT VALUE: 1.75	**LEARNING OBJECTIVE(S): A3**
EXAMINER'S REPORT	
Candidates were expected to understand how to calculate incurred losses by different aggregation methods, including but not limited to calendar year, accident year, and policy year. They were also expected to understand the advantages and disadvantages of various aggregation methods.	
Part a	
Candidates were expected to know the definition of incurred loss as well as how to aggregate losses by calendar year. Common errors included: • Treating the given case reserves as incremental	
Part b	
Candidates were expected to know the definition of incurred loss as well as how to aggregate losses by accident year. Common errors included: • Failing to consider the evaluation date	
Part c	
Candidates were expected to know the definition of incurred loss as well as how to aggregate losses by policy year. Common errors included: • Failing to consider the evaluation date	
Part d	
Candidates were expected to know an advantage and a disadvantage of calendar year aggregation for ratemaking. Common errors included: • Answering in a reserving context rather than ratemaking	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 3	
TOTAL POINT VALUE: 2.25	**LEARNING OBJECTIVE(S): A1, A2, A3**
EXAMINER'S REPORT	
Candidates were expected to on-level premiums, limit ground up losses, trend the limited losses using correct trend and trend periods, load in a large loss provision, and produce a premium-weighted loss ratio. Candidates were expected to explain the reason for limiting losses and using a loss load.	
Part a	
Candidates were expected to on-level premiums using the on-level factors given, limit the ground-up losses by removing the excess losses given, trend the limited losses using limited loss trend to the effective period trend date (3 different trend periods), calculate the large loss load using the 10 years of data given, load the losses for a large loss provision and produce a premium-weighted loss ratio. Common errors included: • Failing to limit losses • Using incorrect trend periods • Failing to calculate the large loss load correctly- using the given excess losses as a percentage of premium or using an incorrect formula on the ten-year period. • Failing to calculate an all year loss ratio	
Part b	
Candidates were expected to explain the reason for limiting losses and using a loss load. Candidates were further expected to note that large losses are volatile and using a long-term average would provide stability. Common errors included: • Noting that large losses were unstable but no reason for the value of a long-term load • Noting that large losses happen and nothing else • Focusing only on the loss in 2015 but ignoring all previous years	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 4	
TOTAL POINT VALUE: 2.75	**LEARNING OBJECTIVE(S): A3**
EXAMINER'S REPORT	
Candidates were expected to understand loss cost trends and the effects of a law change on projected loss costs.	
Part a	
Candidates were expected to know how to calculate loss costs and pick a trend. Common errors included: • Calculating a loss trend using only developed losses, without considering exposures	
Part b	
Candidates were expected to understand the application of trend and the effect of a law change in the determination of projected loss costs. Common errors included: • Not determining the correct trend periods • Misinterpreting the reform factor as 0.8 instead of 1.2 • Omitting the reform factor • Using the most recent year rather than an average without explaining choice	
Part c	
Candidates were expected to understand factors that affect loss cost trends. Common errors included: • Citing expenses that are not part of a loss cost such as overhead expenses • Citing large one-time losses • Citing increases and decreases in losses, without an underlying cause • Citing premium trend	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 5	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): A4, A5**

EXAMINER'S REPORT

Candidates were expected to understand the expense categories (e.g., commission, general, other acquisition, taxes, licenses, and fees) and the differences between the all variable expense method and the premium-based projection method, and calculate the underwriting expense provision, the fixed expense provision, the variable expense provision, and the indicated rate change.

Part a

Candidates were expected to know which expense categories are associated with written premium vs. earned premiums and when to use countrywide expense vs. State A expense in calculating the underwriting expense provision.

Common mistakes included:

- Using written premiums in calculating the General Expense ratio
- Using earned premiums in calculating the Other Acquisition Expense ratio
- Calculating countrywide Taxes, Licenses, & Fees instead of using State A Average Taxes, Licenses & Fees
- Adding the profit provision or ULAE to the Underwriting Expense provision
- Missing some of the expense components in calculating the Underwriting Expense provision
- Calculating target expense ratio instead of real expense by incorrectly assuming no rate change

Part b

Candidates were expected to split each expense component into fixed and variable portions using the premium-based projection method.

Common mistakes included:

- Applying wrong splitting % to expense components, e.g. applying 25% to fixed expenses, 75% to variable expense, or categorizing T&LF and Commissions into fixed expense
- Using premium from the wrong year when calculating the average expense provision

Part c

For calculating the indicated rate change, candidates were expected to calculate the L&LAE by multiplying (1+ ULAE%) to L&ALAE, they were expected to calculated the variable permissible loss ratio and indicated rate change based on the assumption of either all variable expense method or premium-base projection method.

For justification, candidates were expected to explain the reason for selecting one of the 2 underwriting expense provision methods.

Common mistakes included:

- Stating some expenses are fixed without further explanation on the impact on the indicated rate

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

- Failing to link the justification to a key point such as premium size, consistency between countrywide and state, and the distortion certain underwriting expense methods could produce
- Failing to provide a justification
- Simply adding ULAE to L&ALAE, by assuming ULAE % is based on premium rather than L&ALAE
- Calculating the indicated rate instead of the indicated rate change

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 6	
TOTAL POINT VALUE: 4.5	**LEARNING OBJECTIVE(S): A2, B2, B3**

EXAMINER'S REPORT

Candidates were expected to project an unpaid claims estimate and the expected profit provision for a future period. Candidates were expect to demonstrate understanding of:

- Loss development
- The Bornheutter Ferguson (BF) reserving method
- Trending loss and premium given trend factors
- On-leveling premium given rate changes
- How the above interact and how rate change and the profit provision are related

Note that candidates who organized the problem and wrote out each major item or calculation in its own column (for example, the earned premium, or the trend to apply to ultimate loss) were less likely to make cell reference errors such as failing to "lock" a cell.

Part a

Candidates were expected to

- Select claim development factors and accumulate them to ultimate
- Determine the % unpaid, and use that and the other inputs given (expected loss ratio, earned premium and paid loss) to calculate a BF ultimate loss for each of the three accident years 2015, 2016, and 2017

Common errors included:

- On-level the premium and use that instead of the actual earned premium in the calculation
- Attempting to on-level and trend all the pieces, but not in a way that produced estimates for the 2015-2017 that were consistently at the accident year level

Part b

Candidates were expected to

- Trend the results of part a to the midpoint of the losses for policy year starting 7/1/2018 (7/1/2019)
- On-level and trend the premiums for 2015-2017 to the same date
- Use those trended losses and trended and on-leveled premiums to select an appropriate expected loss ratio for the future policy year
- Determine the profit provision appropriate to the indicated rate change given that selected loss ratio, and the other cost factors provided (ULAE and expenses)

Common errors included:

- Using the incorrect trend period
- Improperly on-leveling the premium
- Using the ULAE ratio as an additive factor to LR rather than multiplying the losses by the ULAE ratio
- Making an error in solving for the profit provision as a function of loss ratio, expense provisions, and indicated rate change

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

- Trending the ELR for the BF calculation, rather than trending either the ultimate BF losses or the ultimate LR. This has the effect of only trending the IBNR portion of the loss to current level, not the total loss.

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 7	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): A7**
EXAMINER'S REPORT	
Candidates were expected to have knowledge of the criteria for evaluating rating variables used in classification ratemaking and evaluate the proposed variable based on four criteria other than statistical criteria. Common mistakes included: • Answering using statistical criteria • Confusing "inexpensive to administer" with "verifiable" and providing a criterion mixing the two together • Confusing "causality" with "statistical significance" and arguing causality has already been met according to company's own statistical analysis • Arguing this creates an affordability issue because poor people live further away from their workplaces, which is not necessarily true • Using criteria for exposure base instead of those for rating variables • Simply stating a criterion is met or not met without providing sufficient support	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 8	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): A1, A2**
SAMPLE ANSWERS	
EXAMINER'S REPORT	

Candidates were expected to discuss the shortcomings of a given Commercial General Liability class factor analysis.

Common errors included:

- Stating that a shortcoming of the class factor analysis is that it doesn't take variables besides Class and Territory into account or that it should have more variables. The company only rates on Class and Territory so this is not a shortcoming of their analysis.
- Failing to provide an explanation of why it would constitute a shortcoming of the analysis, for example only stating that losses should be developed / trended.
- Commenting on potential regulatory responses to the indicated relativities.
- Commenting broadly on the data itself rather than shortcomings of the analysis. For example, stating it's odd that Class A has the lowest loss ratio but has the most amount of premium.
- Attempting to re-calculate the indicated relativity and citing math errors as a shortcoming.

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 9	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): A8**
EXAMINER'S REPORT	
Candidates were expected to demonstrate knowledge of Harwayne's method and to calculate the complement of credibility using this method. Candidates were also expected to know the differences between the different methods used to calculate the complement of credibility and their respective advantages and disadvantages. Some candidates did not acknowledge differences between classes or states and therefore made no adjustments when answering the question.	
Part a	
Candidates were expected to know how to calculate the complement of credibility using Harwayne's method. Common mistakes included: • Calculating a complement of credibility that was out of a reasonable range given the pure premium of all the different states in the provided chart of the question (e.g., calculating a complement of credibility of $15, below all of the given pure premiums) • Using losses to adjust the pure premium • Miscalculating the adjustment factor (invert denominator and numerator) • Forgetting to adjust the pure premium of States B and C with the exposure of State A	
Part b	
Candidates were expected to know another method to calculate the complement of credibility and to evaluate it using any of the advantages or disadvantages of this method. Candidates were also expected to recognize whether the selected complement was biased as this is the main advantage of Harwayne's method used in part a. Common mistakes included: • Simply naming a complement of credibility without evaluating it • Not mentioning anything about the possible bias that can be introduced by using the complement	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 10	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): A8**
EXAMINER'S REPORT	
The question required candidates to determine increased limits factors for two different limits using the loss and claim count data provided.	
Part a	
Candidates were expected to use the loss and claim count data provided to determine limited loss for limits of $50,000 & $100,000 and use these to determine the increased limits factor for a $100,000 limit. Common mistakes included: • Using a combination of the losses provided in $000s with the limit provided in $s without converting them to the same basis before determining the limited loss • Using only one or two of the three sets of the size of loss data provided to determine the limited loss • Using the data for only one of the two policies to determine the limited loss • Identifying the limited loss as the limited average severity, which is the limited loss divided by the claim counts	
Part b	
Candidates were expected to use the loss and claim count data provided to determine limited average severities (LAS) for limits of $50,000, $100,000 & $250,000 and use these to determine the increased limits factor for a $250,000 limit. Common mistakes included: • Using a combination of the losses provided in $000s with the limit provided in $s without converting them to the same basis before determining the limited loss • Using only one or two of the three sets of the size of loss data provided to determine the LAS for $50,000 and $100,000 • Using the data for only one of the two policies to determine the ground-up LAS • Using the $100,000 policy to determine the probability of a loss exceeding $100,000 &/or the LAS above $100,000; the $250,000 policy must be used for this because the $100,000 policy has no information for losses exceeding $100,000 • Using the wrong claim counts to determine the LAS or the probability of a loss exceeding $100,000 • Identifying the limited loss as LAS	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 11	
TOTAL POINT VALUE: 3.75	**LEARNING OBJECTIVE(S): A4, A5**
EXAMINER'S REPORT	
Candidates were expected to calculate the permissible loss ratio and the overall indicated rate change. In addition, candidates were expected to calculate the credibility factor to determine the overall rate change to the base territory.	
Part a	
Candidates were expected to calculate underwriting expense ratios, using the appropriate premium base for each expense ratio and removing the one-time commission expense. The candidates were expected to select and provide an explanation for the selected expense ratios used to determine the permissible loss ratio, with clear reason why the selection was appropriate for the permissible loss ratio. Candidates were expected to calculate the permissible loss ratio. Common mistakes included: • Selecting the wrong premium base for one of the expense ratios • Including the one-time commission expense in the expense ratio	
Part b	
Candidates were expected to determine the indicated overall rate change by calculating the projected loss ratio and comparing it to the permissible loss ratio. Common mistakes included: • Using the territory experience to determine the projected loss ratio	
Part c	
Candidates were expected to determine the credibility factor for each territory. Common mistakes included: • Using the in-force premium rather than claim counts to determine credibility	
Part d	
Candidates were expected to determine the indicated change to the base territory after revising the territory relativities and overall rate level. Common mistakes included: • Using inconsistent base relativities when applying the complement of credibility • Not applying credibility • Not incorporating the overall rate change	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 12	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): A10**
EXAMINER'S REPORT	
Candidates were expected to know how to calculate a coinsurance penalty, when the penalty applies and when it doesn't, and how the penalty changes with the loss levels.	
Part a	
Candidates were expected to (1) identify the loss that results in the highest coinsurance penalty and (2) calculate the penalty. Common mistakes included: • Not stating the loss value ($350k) or only stating the loss payment (of $306,250) • Using the wrong loss value ($400k was most common) • Using the wrong coinsurance penalty ratio (80% was most common) • Calculating the penalty as (coinsurance ratio x loss), which resulted in very high coinsurance penalties	
Part b	
Candidates were expected to identify a single number, the point corresponding to (Y) on the chart. While the intended answer was $400k, many candidates commented that their graph had shifted and that it wasn't clear if (Y) was referring to $400k, $500k, or a point in between, so multiple answers received full credit. Common errors included: • Answering with any number below $400k, which wasn't acceptable because Y has no coinsurance penalty and any loss below $400k would have a coinsurance penalty • Dividing $350K by 0.8 instead of 0.875, resulting in $437,500 (instead of $400K) • Any number above the full replacement cost of $500k, which isn't possible in the context of this example	
Part c	
Note that the exam spreadsheet had this subpart labeled as being worth 0.5 point, instead of the correct value of 0.25 point. However, the total point value for all parts of the question (1.5 points) was labeled correctly. Candidates were expected to make one factually correct statement about the insured's coverage. Common errors included: • Answering the question from the point of view of the insurer, not the insured • Stating the coinsurance penalty remains fixed and ceases growing, but never identifying that the penalty is now zero • Confusing coinsurance and reinsurance • Stating that after the coinsurance penalty ends, the insurer pays all losses	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 13	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): A5**
EXAMINER'S REPORT	
Candidates were expected to calculate a premium indication given Loss + LAE data and Permissible Loss Ratio (PLR) information. The candidate was expected to know a scenario and the underlying reason for which the pure premium method would be superior to the loss ratio method.	
Part a	
Candidates were expected to calculate a premium indication given Loss + LAE data and PLR information. Common mistakes included: • Dividing or multiplying L+LAE by 1.5 • Dividing fixed expense amount by 1.5 instead of multiplying by 1.5 • Multiplying by 1.2 instead of dividing by 0.8 for variable expense and UW profit • Multiplying fixed expense amount by 4 instead of just the L+LAE	
Part b	
Candidates were expected to know a scenario and the underlying reason for which the pure premium method would be superior to the loss ratio method. Common mistakes included: • Commenting solely on the pure premium method without listing a reason why the loss ratio method may not work as well as the pure premium method • Writing that calculating OLEP is "difficult or "complex" without giving a reason why (i.e. regulatory changes, dramatic change in mix of business, etc.)	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 14	
TOTAL POINT VALUE: 1	**LEARNING OBJECTIVE(S): B1, B3**
EXAMINER'S REPORT	
Candidates were expected to provide arguments for and against combining the data of two similar companies as well as continuing to use the reported claim development technique on the combined data.	
Part a	
Candidates were expected to provide two arguments for combining the data of two homeowners insurers and continuing to use the reported claim development method. Common errors included: • Restating part of the stem of the item and simply adding "makes sense" or "is appropriate" without providing additional reasoning. For example, "Both companies are monoline homeowners' insurance carriers so combining their data makes sense." • Citing "consistency" as an argument for the approach taken after the merger without providing additional reasoning on why consistency would be beneficial • Some candidates may have misconstrued the word "arguments" and provided responses that were arguments against the approach taken after the merger	
Part b	
Candidates were expected to describe two deficiencies related to the approach taken after the merger, that is, combining the data of the two companies and continuing to use the reported claim development technique. Common errors included: • Identifying a potential issue without describing why it would be a deficiency. For example, stating "the companies could be growing at different rates" without describing specifically the affect it could have on the reported claim development method that would cause it to be a deficiency. • Stating the same deficiency twice in a slightly different way. For example, "both lines do not have the same reporting pattern" and "there could be issues as the LDFs could be different". • Stating an issue that, without further description, would only cause a change in scale. For example, "The companies could have vastly different amounts of exposures in the experience periods" was not sufficient because it would not affect the reported claim development technique if the development patterns of the individual companies were the same.	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 15	
TOTAL POINT VALUE: 2.25	**LEARNING OBJECTIVE(S): B2, B3**
EXAMINER'S REPORT	
Candidate were expected to create and analyze both paid and reported claim development triangles to determine the estimated ultimate value of a group of claims. Data was given for both outstanding case reserve and cumulative paid for a group of six claims at various report dates.	
Part a	
Candidates were expected to construct the annual paid development triangle for a group of 6 claims spread over 3 accident years. Credit was also given to candidates interpreted "annual paid" in the question as the amount paid in a calendar year and, as a result, created incremental paid triangles. Common errors included: • Not including a claim that opened and closed in the same year in later development periods. • Misreading the information and assuming that the data for cumulative paid claims was amount paid in the calendar year rather than the cumulative value. • Including valuations other than year-end as additional payments.	
Part b	
Candidate were expected to construct the reported development triangle for the same group of claims. Common errors included: • Not including a claim that opened and closed in the same year in later development periods. • Adding the calendar-year reserve change to paid loss rather than the ending reserve value.	
Part c	
Candidates were expected to estimate the ultimate claims for the latest accident year based on the reported claim development triangle from part b. Common errors included: • Ignoring the tail factor data given in the question	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 16	
TOTAL POINT VALUE: 1.75	**LEARNING OBJECTIVE(S): B3**
EXAMINER'S REPORT	
Candidates were expected to understand how to develop IBNR using the development technique, how large losses impact this technique, and what conditions are needed for the development technique to work well.	
Part a	
Candidates were expected to know how to calculate IBNR for each accident year based on the provided reported claims triangle. Candidates could do this by calculating ultimate claims and subtracting reported claims or by applying the appropriate (CDF – 1) to the reported claims. Common errors included: • Only calculating IBNR for 2017 • Applying the incorrect CDF to the reported claims • Using the 12 month reported claims as current reported for all accident years • Applying percent unreported to the reported amount • Calculating ultimate instead of IBNR	
Part b	
Candidates were expected to know how anomalies, such as large losses, impact the development technique and apply this information to form an opinion on the appropriateness of the development technique in part a. Common errors included: • Not stating an opinion of the appropriateness of technique • Ignoring or dismissing the impact of large loss at early maturity • Using faulty logic (e.g. not having large losses in the history leads to LDFs which are too low and therefore IBNR is understated) • Providing only minimal rational. For example: Not appropriate because of large loss	
Part c	
Candidates were expected to know what factors or conditions need to be present for the development technique to work well. Common errors included: • Confusing stable patterns for a stable claims environment o Candidates needed to demonstrate an understanding of the underlying cause of having a stable pattern. • Citing similar (or expectations of similarity of) patterns, without discussing why these are valid expectations • Focusing on the line of business without discussing the claims environment • Focusing on absence of large loss anomalies without discussing the claims environment • Suggesting an alternative technique which would work in part a. • Vague wording, such as "insurer has reached a steady state"	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 17	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): B3**
EXAMINER'S REPORT	

Candidates were expected to know how to apply a frequency-severity method to calculate expected unpaid losses. As noted in the *Friedland* text, there are many variations of this method. Two of the three techniques described in detail by Friedland are appropriate for this exam question: 1) a development technique where claim counts and severities are separately developed to ultimate ("Approach 1" in *Friedland*) and 2) a disposal rate approach where future claim payments are estimated by maturity age ("Approach 3" in *Friedland*).

Under the first method, candidates were expected to convert incremental severities to cumulative paid severities, then use them to calculate development-to-ultimate factors and finally estimate ultimate and unpaid portions of losses for accident year 2017. (Ultimate claim counts were given and did not need to be estimated.) Under the second method, candidates were expected to calculate disposal rates and use them to calculate expected closed claims for AY 2017 at each maturity age, apply correct trends to historical severities at each maturity age and then calculate projected unpaid losses.

Common mistakes included:

- Applying disposal rates without adjusting for the actual percent open at the beginning of the period
- Applying trend factors incorrectly to the claim severity triangle
- Selecting disposal rates or claim severities based solely on the latest calendar year's experience with neither an explanation nor calculation of the prior year figures for comparison
- Treating incremental paid severities as incremental paid losses or cumulative paid severities

A number of candidates used development techniques to estimate claim closures and claim severities at various maturity ages rather than using disposal rates and trending, respectively. When done properly, such responses were given credit even though we consider these approaches non-optimal solutions to the given actuarial problem.

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 18	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): B3**
EXAMINER'S REPORT	

Candidates were expected to calculate the Expected Claims Ratio (ECR) and use it to calculate IBNR using the Cape Cod technique.

Common errors included:

- Calculating the Ultimate Losses instead of the IBNR
- Using anything other than the all-year weighted average for the ECR. As stated in the text, the correct calculation of the ECR is (sum of the latest diagonal of reported losses for all available years)/(sum of the used up premium for all available years)
- Trending only premiums or only losses. If a trend was applied it needed to be applied to both. (Note that no trend was required or expected.)
- Reversing the % reported when calculating the Used Up Premium
- Confusing the % reported and % unreported in the calculations
- Using the age-age factors instead of the age-ultimate to calculate % reported
- Calculating the ECR as the Ultimate Losses / On-Level Earned Premium
- Age-Ult calculated without the tail factor

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 19	
TOTAL POINT VALUE: 2.25	**LEARNING OBJECTIVE(S): B2, B4**
EXAMINER'S REPORT	
Candidates were expected to understand how to set up a loss development triangle, determine LDFs and calculate the ultimate losses for the latest accident year. Candidate was also expected to understand how changes in policy effective dates and/or reporting patterns would affect the use of the calculated LDFs.	
Part a	
Candidates were expected to calculate ultimate loss for the most recent accident year. Data was provided by accident year and calendar year. Candidates were expected to organize the data into a loss development triangle, calculate age to age factors, make a selection of age to age factors, and using the tail factor provided, determine the age to ultimate factor to be used to develop the most recent accident year losses. Common errors included: • Not properly constructing the triangle • Using age-to-age factors instead of age-to-ultimate. • Not using the tail factor provided.	
Part b	
Candidates were expected to understand how the ultimate would be affected if the average policy effective date for the most recent year was moved up by 3 months. Candidates were expected to understand that a movement to an earlier average effective date would mean the average accident date would also be earlier, therefore the use of the LDFs calculated in part a would overstate the ultimate loss. Common errors included: • Stating losses would be understated • Stating the losses would be overstated without explanation of why	
Part c	
Candidates were expected to suggest an adjustment which could be made to the data to account for the change in average effective date. Common errors included: • Suggesting the use of Bornhuetter-Ferguson or Berquist-Sherman adjustments. These adjustments would have been correct if the issue was case reserve adequacy, not a change in average policy effective date.	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 20

TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): B3, B4, B5**

EXAMINER'S REPORT

Candidates were expected to calculate and apply the appropriate diagnostics to understand why neither the incurred nor paid chain ladder development methods would be appropriate to use as a tool for estimating ultimate claims given the data provided. They were then expected to provide two appropriate questions that they would ask the claims department based on their observations.

Part a

Candidates were expected to provide diagnostics which demonstrated that average case reserves per claim increased sharply in calendar year 2017 and the claim settlement rate also increased sharply in calendar year 2017. Candidates were expected to conclude that neither the reported chain ladder development method nor the paid chain ladder development method were appropriate to use for the given data.

Common errors included:

- Discussing increases in average reported losses but failing to discuss average case reserves
- Developing reported claims using age-to-age factors not sufficiently supported by the data or candidate work
- Drawing conclusions from paid to reported ratios incorrectly (e.g., concluding a decrease in this ratio must mean paid losses are decreasing without recognizing it might instead mean reported losses are increasing)
- Commenting on the change in total case reserves without commenting on the average per claim
- Restricting comments to the stability of the historical paid and reported development factors without reviewing other diagnostics
- Concluding the data must indicate the presence of a large loss

Part b

Candidates were expected to provide questions that were both based on the data provided and that would be relevant to a claim department.

Common errors included:

- Providing questions appropriate to an underwriting department rather than claim department
- Providing questions that are better answered by further actuarial research than by the claim department
- Providing questions that can be answered by observing the data given (e.g., Did settlement rates increase during 2017?)
- Providing two very similar questions
- Providing questions that were not based on the data (e.g., asking about large losses)

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 21	
TOTAL POINT VALUE: 2.75	**LEARNING OBJECTIVE(S): B5, B2**

EXAMINER'S REPORT

As noted in the General Comments section, this question was deemed defective. Ultimate claim counts were intended to be given as part of the question, but they were not. The problem could be solved by calculating ultimate claim counts using the closed claim count triangle, and credit was given to candidates who did so. However, this would typically be inappropriate absent adjustments to account for changes in claim disposal rates. No instructions were given to candidates as to how to make such adjustments, and thus when the question was graded full credit was given when ultimate claim counts were determined without any such adjustments.

As noted in the General Comments section, this question was excluded from the score and pass mark. However, it was graded and any candidates who would have passed the exam with this question included as part of the exam but would have failed the exam with this question excluded were considered to have passed the exam.

The description below ignores the issue noted above.

Candidates were expected to understand and apply the Berquist-Sherman technique, identify and adjust claims data for changes in claim disposal rates, and calculate an ultimate claims estimate based upon the adjusted data.

Part a

Candidates were expected to make an estimate of ultimate claim counts with the given information.

Common mistakes included:

- Assuming claim counts for AY 2014 at age 48 were not at ultimate, despite the cumulative paid claims at age 48 ($4,100) being equal to AY 2014 ultimate claims ($4,100)

With the Ultimate Claim Counts selected, candidates were expected to calculate claim disposal rates. Upon observing that disposal rates have changed in history, candidates were expected to select the latest diagonal of disposal rates to calculate an Adjusted Closed Claim Count Triangle.

Common mistakes included:

- Assuming the given Closed Claim Count triangle was already adjusted for changes in claim disposal rates
- Selecting something other than the latest the diagonal of claim disposal rates
- Not correctly applying the claim disposal rate to the Ultimate Claim Counts

Based on the Adjusted Closed Claim Counts, candidates were expected to calculate Adjusted Cumulative Paid Claims using the given parameters for a two-point exponential regression under the Berquist-Sherman technique framework.

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

Common mistakes included:

- Making adjustments to the latest diagonal of cumulative paid claims
- Not using adjusted closed claim counts in calculating adjusted paid claims
- Not making the correct adjustment to paid claims, nor selecting the correct regression parameters

With the Adjusted Cumulative Paid Claims calculated, candidates were expected to calculate a claim ultimate estimate for AY 2017 using the Loss Development Factor (Chain Ladder) technique.

Common mistakes included:

- Not properly supporting the age-to-age development factors selected

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION: 22	
TOTAL POINT VALUE: 2.75	**LEARNING OBJECTIVE(S): B6**
EXAMINER'S REPORT	
Candidates were expected to estimate recoveries for salvage and subrogation via two different methods and to explain why the ratio method might be more appropriate.	
Part a	
Candidates were expected to calculate the salvage and subrogation recoverable for accident year 2017 using the development method. Common mistakes included: • Calculating ultimate salvage and subrogation rather than the amount recoverable (i.e., failing to subtract the salvage and subrogation received to date) • Failing to selecting the simple all-year average as directed • Performing the calculation for something other than accident year 2017	
Part b	
Candidates were expected to calculate the salvage and subrogation recoverable for accident year 2017 using a ratio approach. Common mistakes included: • Calculating ultimate salvage and subrogation rather than the amount recoverable (i.e., failing to subtract the salvage and subrogation received to date) • Using a value for ultimate claims other than the value provided • Selecting a ratio without providing sufficient support for the ratio • Failing to selecting the simple all-year average as directed • Applying a ratio in a manner inconsistent with how the ratio is calculated (e.g., calculating as a ratio to net claims but applying to gross claims, or vice versa)	
Part c	
Candidates were expected to explain why the method in part b. (ratio) is preferred to the method in a (development). Common mistakes included: • Describing the ratio method but not explaining why it is preferred over the development method • Discussing ALAE rather than salvage and subrogation	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 23	
TOTAL POINT VALUE: 2.5	**LEARNING OBJECTIVE(S): B7**
EXAMINER'S REPORT	

Candidates were expected to use the count-based Mango-Allen staffing technique to estimate unpaid ULAE. Candidates were expected to calculate expected future Opened, Closed and Pending (OCP) claims by calendar year in order to determine the expected future staffing levels. Candidates were then expected to apply future trended salaries to the expected future staffing levels by calendar year and sum all future calendar years to estimate total ULAE unpaid.

Common mistakes included:

- Mismatching accident years with the development age when estimating future opened or closed claims by calendar year
- Failing to include all three pieces of OCP claims in the sum
- Applying salary trend to development age or accident year rather than calendar year
- Failing to apply salary trend
- De-trending salaries rather than using nominal values applicable to the future
- Failing to include all future calendar years' unpaid ULAE or adding previously paid ULAE

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 24	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): B3, B7**
EXAMINER'S REPORT	
Candidates were expected to understand how to use the paid development and Bornhuetter-Ferguson (BF) development techniques and apply them to the calculation of ultimate ALAE. They were also expected to understand the strengths and weaknesses of these two methods in the situation provided. They were also expected to justify a selection of an ultimate ALAE estimate based on the results of the two development techniques.	
Part a	
Candidates were expected to use the paid development technique to develop ALAE. Candidates were expected to justify selections of LDFs when they were not calculated using all years of available data. Common mistakes included: • Attempting to use the paid-to-paid ratio development technique (which was not the technique specified to be used) • Neglecting to include the 60-ult tail factor in the CDF	
Part b	
Candidates were expected to use the BF technique to develop ALAE. Common mistakes included: • Confusing the expected claims ratio technique with the BF method • Using the age-to-age factor instead of age-to-ultimate factor to calculate percent unpaid	
Part c	
Candidates were expected to assess the data in the paid ALAE triangle, understand the strengths and weaknesses of the techniques in parts a. and b., and determine a recommended estimate for ultimate ALAE given the situation presented in the question. Common mistakes included: • Failing to address the anomaly in AY 2017 and how it impacted the candidate's recommendation	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 25	
TOTAL POINT VALUE: 2.5	**LEARNING OBJECTIVE(S): B3, B4**
EXAMINER'S REPORT	
Part a	
Candidates were expected to briefly describe two possible changing conditions based on their observation of the given data. Common mistakes included: • Listing only one change • Stating that ultimate claim ratios were decreasing rather than increasing • Stating that payment patterns were slowing down rather than speeding up • Listing a change is due to large losses, which contradicts the assumptions provided	
Part b	
Candidates were expected to appraise how each of the two changes answered in part a. affects each of the four estimation techniques. Common mistakes included: • Listing only the impact of one change for a given technique • Stating the change causes the method to overestimate or underestimate without providing an explanation	

SPRING 2018 – MAKE-UP EXAM
EXAMINER'S REPORT

QUESTION 26	
TOTAL POINT VALUE: 1.75	**LEARNING OBJECTIVE(S): LO(S) B3, B8**
EXAMINER'S REPORT	
Candidates were expected to demonstrate knowledge regarding loss development and loss development patterns.	
Part a	
Candidates were expected to calculate actual loss development between 2 evaluations, project expected future loss development based on a loss development pattern, and compare actual and expected development. Common mistakes included: • Calculating the actual versus expected for fewer than all 3 accident years • Interpolating between Development Factors instead of Percent of Ultimate Factors • Calculating the expected emergence for 12 months 12/31/16 to 12/31/17 instead of 6 months 12/31/16 to 6/30/17 • Misinterpreting the given age-to-ultimate factors as age-to-age factors	
Part b	
Candidates were expected to understand the implications of an actual versus expected comparison and use it to select between different estimation methods. Common mistakes included: • Identifying a scenario as better without providing justification for the selection • Justifying a scenario based on whether the estimate was over or under estimating, regardless of its closeness to actual development	