

GH FVC Model Solutions

Fall 2022

1. Learning Objectives:

1. The candidate will understand and apply valuation principles for insurance contracts.

Learning Outcomes:

- (1f) Describe, calculate and evaluate non-claim reserves and explain when each is required
- (1g) Apply applicable standards of practice related to reserving.

Sources:

AAA Premium Deficiency Reserves Discussion Paper

GHFV-103-16, Section 6 (Premium Deficiency Reserves)

Commentary on Question:

There are multiple sub-questions in this question – and multiple parts within each sub-question. Many candidates did not provide answers in a clear format which resulted in reduced marks.

Solution:

- (a) Compare and contrast the testing and reporting contract grouping levels with respect to:
 - (i) The purpose of the contract grouping
 - (ii) Factors impacting how the contract grouping is accomplished

Commentary on Question:

Candidate should realize there are two comparison points (Testing Contract Grouping and Reporting Contract Grouping). Sub-question (i) is looking to compare and contrast these two points for the purpose of each contract grouping. Sub-question (ii) is looking to compare and contrast these two points on the factors impacting how the contract groupings are accomplished. Candidates should identify similarities and differences when asked to compare and contrast a point.

Candidates may have different points compared to below. Points are awarded for any valid answers.

1. Continued

(i)

Similarities	<ul style="list-style-type: none">• Both grouping levels are a way to group a company's business to determine whether a PDR is necessary.• Both grouping levels may have regulatory requirements but also require actuarial judgment.
Differences	<ul style="list-style-type: none">• The testing level is the initial level and its purpose is to achieve a contract grouping so that the projections will provide meaningful results based on reasonable and credible assumptions.• The reporting level is an aggregation of the testing level results to align with external reporting in the appropriate statutory financial format. For GAAP reporting, groupings are generally at a corporate consolidated level and statutory reporting is generally at a legal entity level.

(ii)

Similarities	<ul style="list-style-type: none">• For both the testing and reporting groups, the materiality of each grouping relative to the whole reporting entity should be considered.• Groups that are not material by themselves should be combined with the most similar other group.
Differences	<ul style="list-style-type: none">• Because reporting groups are framed around external reporting, considerations in establishing the groupings are defined in the respective regulations: SSAP 54 for statutory and FAS 60 for GAAP.”• Other factors to consider when determining reporting level groupings include how policies are acquired, marketed, serviced, and measured.

- (b) Describe the components that should be included when documenting the assessment of whether a PDR is needed.

Commentary on Question:

The following is a sample solution that warrants full mark. Many candidates missed the describe component and only listed points, partial marks were awarded for this. Candidates may have different points compared to below. Points are awarded for any valid answers.

1. Continued

- Description of the groupings, along with:
 - Rationale for the groupings (such as “marketed,” “serviced,” and “measured” issues)
 - An indication of which lines of business were combined due to immateriality
 - The basis of changes from prior years
- All assumptions used in the projections, such as discount rate, premium rate increase, claims trend
- Discussion of time periods chosen for the projections, over which the deficiency is calculated
The basis on which losses will be offset by the release of the reserve – based on timeline or on an index such as earned premiums or membership

- (c) Describe American Academy of Actuaries guidance concerning the treatment of expenses that you should consider in your assessment of Osgoode’s PDR.

Commentary on Question:

Although there are different treatments of expenses available to Osgoode's PDR, this question specifically asked about the AAA guideline. Successful candidates were able to reference and describe the AAA guidelines concerning the treatment of expenses; not listing the expenses that could be included in the calculation.

- Expenses directly attributable to the business being modeled must be reflected in the PDR calculation for that business
- Expenses that are not relevant at all to the business being modeled do not have to be included in any fashion
- All other expenses, including even fixed and indirect expenses, must be supported by some business
There is flexibility to allocate some expenses to lines of business (e.g., life and annuity) that fall entirely outside the health PDR calculations as long as it can be demonstrated that those other lines can support those expenses

- (d) Critique management’s proposal.

Commentary on Question:

Candidate should identify that the management proposal conflicts with HRGM guidelines. Candidate should provide reasons to support such conflict and rationale on their proposal to group or not group LTD and LTC. Candidate should also identify LTD claims system implementation cost should not be allocated to LTD. The following is a sample critique, other proposals and rationales were accepted.

1. Continued

- Management’s proposal conflicts with HRGM guidelines, which specify separate lines of business for LTC and income protection (including LTD)
- Although HRGM guidelines allow lines of business that are not material on their own to be combined with the most similar other line of business, the claims and premium volume for Osgoode Insurance Company’s LTC business does not appear to be small enough to be considered immaterial.
- The new claims processing system is only applicable to LTC, so the associated expenses must be reflected in the PDR calculation for LTC. These expenses cannot be spread across LTC and LTD.

(e) Calculate the PDR as of December 31, 2022 in the below scenarios. Show your work.

- (i) LTC and LTD are tested and reported separately
- (ii) LTC and LTD are combined for testing and reporting purposes

Commentary on Question:

Candidates should calculate Gain/Loss for each year, then calculate the PDR for the book of business. For (ii), Candidate should identify and illustrate in a calculation, because no year is projected to have a loss, a PDR for combined LTC and LTD block is not required. Candidate needed to show their work to be awarded full marks

(i)

Yr	Annual Projections			Discount Factors		Discounted to 12/31/2022			
	Prem	Clm	Exp	1/1 cash flows	7/1 cash flows	Prem	Clm	Exp	G/L
2023	653	588	59	0.0	0.5	653	584	59	11
2024	692	609	113	1.0	1.5	682	596	111	-24
2025	714	663	58	2.0	2.5	693	639	56	-2
2026	735	671	65	3.0	3.5	703	637	62	4

Because 2025 was that last year that carried a loss, gain from 2026 should not be included in the PDR calculation. As such, PDR is \$15,000 for the LTC block.

Yr	Annual Projections			Discount Factors		Discounted to 12/31/2022			
	Prem	Clm	Exp	1/1 cash flows	7/1 cash flows	Prem	Clm	Exp	G/L
2023	2,755	1,873	614	0.0	0.5	2,755	1,859	609	286
2024	2,975	1,993	688	1.0	1.5	2,931	1,949	673	309
2025	3,184	2,229	703	2.0	2.5	3,091	2,148	677	266
2026	3,423	2,396	771	3.0	3.5	3,273	2,274	732	267

1. Continued

Because no year is projected to have a loss, no PDR is required for the LTD block.

(ii)

Yr	LTC	LTD	Total
2023	11	286	297
2024	-24	309	285
2025	-2	266	264
2026	4	267	272

Because no year is projected to have a loss, no PDR is required for the combined LTC and LTD block.

2. Learning Objectives:

1. The candidate will understand and apply valuation principles for insurance contracts.

Learning Outcomes:

- (1g) Apply applicable standards of practice related to reserving.

Sources:

Read, Think, Write

ASOP41

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) List the Academy qualifications required for issuing a Statement of Actuarial Opinion.

Commentary on Question:

The answer was simply the three components of AAA qualifications standards stated at the beginning of the article. Several candidates missed on this component. No points were awarded for merely stating that credentials were required as the question asked what goes into obtaining and maintaining these credentials

- Basic education
- Experience
- Continuing education
- Actuary must document continuing education activities and attest to satisfying standards annually

- (b) Assess whether any of the prescribed opinion statements have been violated for each of the items noted above. Justify your answer.

Commentary on Question:

Candidates did generally well on this question, but candidates generally struggled with some subpoints (mainly i and vi). On vi, candidates that declared that including PAD implicitly was correct for sufficient provisions, but that explanation on the reasoning should be required and that an explicit margin would be preferable got partial credits.

2. Continued

A good answer clearly stated whether there was a violation or not, which prescribed statement was violated and an explanation as to why. Candidates would still get full marks even if they did not specify the correct prescribed statement that was violated if the rationale was good. Prescribed opinion statements are:

1. *The liabilities are in accordance with accepted actuarial standards...*
 2. *... are based on appropriate actuarial assumptions...*
 3. *... meet the requirements of the state...*
 4. *... make good and sufficient provision...*
 5. *... consistent with the preceding year-end...*
 6. *... provision for all items which ought to be established...*
-
- i. Violated 5. ABC changed reserve basis between years, and this has to be disclosed in the opinion a statement. Often times, the statement will be qualified in cases where the actuary is not involved in the prior year work or lacks knowledge on how it was done, or if it's a new item that did not exist in the prior year.
 - ii. Violated 6. ABC must participate in the mandatory risk adjustment program. The strategy to attract healthy members will likely lead to risk score below the average of the market. Therefore, ABC needs to establish a liability for the risk adjustment payable amount.
 - iii. Violated 3. Even though the individual line lacks credible, the two LOB are too different to be a good proxy for completion factors. Medicare Supplement has cost sharing features and demographics that cannot apply to the individual business without significant adjustments. It would be preferable to use other methods, such as loss ratio projection, or to acquire data from a more similar product.
 - iv. Violated 1. According to ASOP, an asset adequacy analysis must be performed. There is considerable asset-liability mismatch risk with ABC's strategy that requires testing.
 - v. No violation. The changes are only applied to new issues
 - vi. Violation of 4. ABC assumptions will likely lead to reserves that are too high, thus provisions that are not "good", especially for claims in later months of run-off.
 - vii. Violated 6. Based on patterns of losses on a closed group where rate increases are not possible, a premium deficiency reserve (PDR) should be established. A gross premium valuation (GPV) has to be performed to determine the proper reserve amount.
-
- (c) Identify additional steps required pursuant to ASOP 41.

2. Continued

Commentary on Question:

The suggested answer focuses on next steps with regards to reliance on the CFO certifying accuracy and completeness of data. Several candidates answered with items to disclose per ASOP 41, such as conflict of interest, intended purpose and scope of the report, intended users, etc. These were all acceptable answers and most candidates received full credit on part c.

- Disclose reliance
- Disclose uncertainty or risk
- Identify the party responsible for each material assumption and method, disclosing where it differs from the opining actuary's judgment
- Define the extent of the reliance, for example by stating whether checks on reasonableness of the data have been applied

3. Learning Objectives:

1. The candidate will understand and apply valuation principles for insurance contracts.

Learning Outcomes:

- (1c) Calculate appropriate claim reserves given data.
- (1e) Evaluate data resources and appropriateness for calculating reserves.

Sources:

Group Insurance Chapter 40

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe studies and considerations for evaluating the adequacy of claim reserves for long-term benefits.

Commentary on Question:

Most candidates correctly identified and described run-off studies and actual-to-expected claim termination studies. Very few candidates included any consideration listed under “special considerations”. Listing and describing four points (i.e., run-off studies, A/E claim termination rate studies and two of the special considerations) were awarded full marks.

- Runoff Studies: Previous reserve balances are compared to subsequent payments and reserve balances, with appropriate adjustments for interest.
- A/E Claim Termination Rate Studies
 - Compares actual claim terminations experienced by a company to expected claim terminations.
 - A/E ratios of greater than 1 indicate more claims are terminating than assumed in reserve basis, meaning reserve basis is adequate.
- Special Considerations
 - **Credibility:** It is important to ensure that there is sufficient data in the study before drawing conclusions about the experience.
 - **Types of terminations included:** Generally speaking, only those terminations due to recovery and death should be included, since most morbidity tables reflect only these types of terminations. Claims that terminate due to the end of the benefit period or the presence of a benefit limitation should not be counted as terminations.
 - **Exposure Characteristics** that are not reflected in the morbidity basis may require multiple A/E studies.

3. Continued

- **Voluntary Claim Settlements:** These are often excluded in studies since settlements are usually offered only to claims that have a low probability of death or recovery and are expected to continue receiving payments in the absence of a settlement. Counting settlements as claim terminations may result in an overstatement of A/E claim termination rates.
- (b) Calculate the tabular claims reserves for the member above as of
- June 30, 2022
 - July 31, 2022
 - August 31, 2022

Show your work.

Commentary on Question:

Most candidates did well calculating the tabular reserves, with many candidates receiving full marks. Most candidates correctly applied the formula of benefits \times continuance \times discounting. Common mistakes included miscalculating the continuance factor (not using the average in the numerator) and using an annual discount rate (rather than monthly). Each part of the calculation was considered separately when awarding points – candidates were not penalized for the same mistake multiple times.

3. Continued

(b) Uses the formula

$$V_n = \sum_{t=n}^{BP-1} \text{Benefit}_{t+1} \cdot \frac{l_{t+0.5}}{l_n} \cdot (1+i)^{-(t-n+0.5)/12}$$

Where:

n = Claim duration at the valuation date, in months (the claim reserve is computed as of the end of duration n)
 Benefit = Benefit paid in month t. The first benefit occurs in the month immediately following the valuation date.
 t = Claim duration, in months from claim incurral date
 BP = Final claim duration in which benefits may be paid
 l_x = Value from continuance table at claim duration x for the appropriate age at disability
 i = Annual interest rate

This formula assumes that claim payments are made in the middle of a month, so the continuance and interest discount terms reflect a mid-month assumption. continuance values for the middle of a month are computed through averaging:

$$l_{x+.50} = \frac{l_x + l_{x+1}}{2}$$

Determine age at disability 64.54 used 64 column
 Determine n for each date
 Disabled at 04/01/2022
 Elimination period 04/01/2022 07/01/2022
 First payment is 07/15/2022
 Determine when person turns 65 10/01/2022
 Last payment is 09/15/2022
 so need to use half duration values for age 64 for part c

x	used 64 column											
0	1,000	4/1/2022										
1	950	5/1/2022										
2	900	6/1/2022	6/30/2022 BP	n	t	b_{t+1}	$l_{t+0.5}/l_n$	$(1+i)^{-(t-n+0.5)/12}$	product			
3	850	7/1/2022		6	3	3	\$2,500	0.9706	0.9984	\$2,422.51		
4	800	8/1/2022										
5	750	9/1/2022										
6	700											\$6,805.77
7	650											
8	600	7/31/2022 BP		n	t	b_{t+1}	$l_{t+0.5}/l_n$	$(1+i)^{-(t-n+0.5)/12}$	product			
9	550			6	4	4	\$2,500	0.9688	0.9984	\$2,417.92		
												\$4,672.47
		8/31/2022 BP		n	t	b_{t+1}	$l_{t+0.5}/l_n$	$(1+i)^{-(t-n+0.5)/12}$	product			
				6	5	5	\$2,500	0.9667	0.99837	\$2,412.72		
												\$2,412.72

(c) List common data integrity issues associated with long-term benefit reserves.

Commentary on Question:

Most candidates correctly listed common data integrity issues associated with long-term benefit reserves. Full marks were awarded for listing at least 6 of the points listed below.

- Missing Data
- Misstated age or gender
- Inaccurate elimination periods or benefits periods
- Incomplete or inaccurate information on benefit integration
- Inaccurate or inconsistent determination of the incurred date
- Inaccurate information on cause of disability
- Incorrect coding of claim status (open, closed, pending)

3. Continued

- (d) Calculate the sufficiency or deficiency of the reserve for this member as of July 31, 2022. Show your work.

Commentary on Question:

Candidates that did well on part (b) also did well on part (d). Part marks were awarded to candidates who did not correctly calculate the reserve, but did correctly compare part (d)'s reserve to part (b)'s and state whether there was a sufficiency or deficiency. Common mistakes made on part (d) are consistent with mistakes made in part (b).

Determine n for each date

x	still use 64 column	
0	1,000	2/1/2022 7/31/2022
1	950	3/1/2022
2	900	4/1/2022
3	850	5/1/2022
4	800	6/1/2022
5	750	7/1/2022
6	700	8/1/2022
7	650	9/1/2022
8	600	
9	550	

BP	n	t	b_{t+1}	$I_{t+0.5}/I_n$	$(1+i)^{-(t-n+0.5)/12}$
	8	6	6	\$2,500	0.9643
		6	7	\$2,500	0.8929

product	vs	original
\$2,406.78		
\$2,221.23		
\$4,628.00		\$4,672.47
		\$44.46

sufficient

- (e) Calculate the pending reserve for this member as of July 31, 2022, assuming the claim is reported and unpaid on July 31, 2022. Show your work.

Commentary on Question:

Most candidates did not do well on part (e). Most candidates applied a single pending factor to the previously calculated reserve and did not consider past payments owed to the member. Candidates who did consider past payments owed to the member did not always apply a pending factor to these payments and/or accumulate interest.

3. Continued

Determine n for each date

x	still use 64 column	
0	1,000	2/1/2022 7/31/2022
1	950	3/1/2022
2	900	4/1/2022
3	850	5/1/2022
4	800	6/1/2022
5	750	7/1/2022
6	700	8/1/2022
7	650	9/1/2022
8	600	
9	550	

		Pending Factor
Tabular Reserves from (D)	\$4,628.00	72%
Payment for 7/1/2022	\$2,500.00	72%
Payment for 6/1/2022	\$2,508.18	90%
Payment for 5/1/2022	\$2,516.40	90%
Pending Reserve	\$9,654.28	

4. Learning Objectives:

1. The candidate will understand and apply valuation principles for insurance contracts.

Learning Outcomes:

- (1c) Calculate appropriate claim reserves given data.
- (1d) Reflect environmental factors in reserve calculations (trend, seasonality, claims processing changes, etc.).

Sources:

Group Insurance, Skwire, Daniel D., 8th Edition, Chapter 39

ASOP 23: Data Quality (excluding Appendix)

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe considerations associated with establishing reserves for short-term benefits.

Commentary on Question:

Part (a) was large a recitation of a list from Chapter 39 of Group Insurance. Most candidates did moderately well on this part with very few candidates receiving either the full score or no points. Only responses with descriptions were awarded points. Candidates were awarded additional points for relevant responses beyond those listed below.

- Incurral dating method – some methods incur for claims as they occur and some incur for claims in the future
- Reserve basis – for STAT, GAAP, and Tax use different margin, methods, interest, and continuance tables
- Internal considerations – such as internal staffing or computer system changes
- External considerations – such as epidemics, new government laws
- Economic – such as pent up demand after a recession for discretionary services
- Reserve cells – separate estimation for claims exhibiting different claim cost, frequency, or severity
- Controls and reconciliation – review and confirm the data underlying the analysis
- Claim seasonality – adjust for the impact of seasonality

4. Continued

- (b) Describe considerations for setting reserves for BigCo on March 31, 2021.

Commentary on Question:

Part (b) asked candidates to apply the list from Part (a) in a specific situation. Candidates generally recognized that Covid was an event that needed to be addressed and most candidates recognized that either you need to adjust for changes in incurred costs or in completion factors. Candidates were awarded additional points for relevant responses beyond those listed below.

- Since no claims were incurred in April and May we would not want to include those two months in any averaging.
- There is likely some built up demand in the months that followed. That will cause reserves needing to be higher.
- Because of deferred care, health claims in the following months might be higher.
- Due to the economic impact of covid-19, individuals may not have the finances to pay for dental services and forgo their visit. Saves money now, but likely has a bigger impact down the road.

- (c) Calculate the IBNR reserve as of March 31, 2021 using the age-to-ultimate development method. Show your work.

Commentary on Question:

Many candidates received full credit on this part. Common errors included either including January 2020 and February 2020 incurrals in data to develop the completion factor when the payment pattern has clearly changed or basing the completion factors entirely on January 2020 and February 2020 data. Although the answer below uses a link-ratio method, full credit was also given to candidates who based completion factors only on incurred months that were fully complete.

4. Continued

Note for the prior 8 months, claims have been complete at month 4.

Data prior to August 2020 is not used due to the impact of the COVID 19 pandemic on claims.

Average Incurred Month	Paid to Paid factor				Calculated Age to Ultimate	
	1	2	3	4		
6/1/2020	2.0606061	1.135294	1.0284974	1	3	1
7/1/2020	1.9462366	1.176796	1.0211268	1	2	0.980848
8/1/2020	1.8638743	1.16573	1.0289157	1	1	0.839418
9/1/2020	1.9798995	1.139594	1.0200445	1	0	0.426312
10/1/2020	2.035	1.159705	1.0105932	1		
11/1/2020	1.9851485	1.169576	1.0170576	1		
12/1/2020	1.9767442	1.126471	1.0104439			
1/1/2021	1.8291457	1.274725				
2/1/2021	2.0445545					
3/1/2021						

	Inc. and Pd	Age to Ult.	Incurred.	IBNR
12/1/2020	387	1	387	0
1/1/2021	464	0.980848	473	9
2/1/2021	413	0.839418	492	79
3/1/2021	194	0.426312	455	261

Total **349**

- (d) Evaluate the reasonableness of the reserve from (c) using membership and premium data. Show your work and justify your answer.

Commentary on Question:

This part was looking for the candidate to do a comparison of both implied PMPMs and implied loss ratios based on the monthly incurred claims calculated in the prior question. Many candidates only performed one of the tests.

4. Continued

Average PMPM for complete data after pandemic:	17.07	June 2020-November 2020
Average LR for complete data after pandemic:	71%	June 2020-November 2020

Implied Incurred for Incomplete Months			Loss
	PMPM	Ratio	
1/1/2021	17.22		72.0%
2/1/2021	19.59		81.8%
3/1/2021	17.93		74.3%
Average	18.22		75.9%

The PMPM and loss ratio is reasonably aligned with historical average.

Therefore, the reserve appears reasonable.

- (e)
- (i) Assess the level of compliance for each listed consideration. Justify your answer.
 - (ii) Recommend improvements to BigCo for each deficient consideration.

Commentary on Question:

Part (e) (i) asked the candidate to apply ASOP 23 to the specific situations described. Most candidates scored some points on the question but few candidates received a full score. Part (e) (ii) asked the candidate to recommend improvements for deficient considerations. The primary improvements to be identified were performing a review of the data and looking for additional data to give some perspective on things such as possible seasonality and whether the slow payment patterns for January 2020 and February 2020 were related to processing issues resulting from Covid shutdowns.

4. Continued

<ul style="list-style-type: none">• Selection of Data<ul style="list-style-type: none">i. Mostly compliant. Given that the data looks complete for the analysis it is the right data, but there is some concern for the lack of data during the closure.ii. Identify other sources that may help fill in the gap -- potentially historical data for the client or other industry data
<ul style="list-style-type: none">• Review of Data<ul style="list-style-type: none">i. Deficient. The client explicitly indicates no review has been conducted. A review is necessary given the gaps in the data and further analysis will be required.ii. Review with the client if the lags after the office closure are expected to return to the lags experienced prior to the office closure.
<ul style="list-style-type: none">• Use of Data<ul style="list-style-type: none">i. Mostly compliant. The data is appropriate for the calculation requested. However, there are issues within the data that must be understood, or it could limit the analysis.ii. Validate data to ensure a higher level of appropriateness to complete the reserve calculation.
<ul style="list-style-type: none">• Reliance on Data Supplied by Others<ul style="list-style-type: none">i. Possibly deficient. Much is not known about the data source.ii. Review the data provided with the client to better understand how the information ties out with the general ledger and reconcile to other sources. Disclose any reliance of the claims data.
<ul style="list-style-type: none">• Reliance on Other Information Relevant to the Use of Data<ul style="list-style-type: none">i. Possibly deficient. The client did not provide any contract or plan/benefit details, which may be relevant to the reserve calculation. The loss ratio appears to have improved since the pandemic, perhaps caused by a change in benefits.ii. Review with the client if the contract provisions and plan details changed once the pandemic began, or why the client believes the change in loss ratio occurred.
<ul style="list-style-type: none">• Confidentiality<ul style="list-style-type: none">i. Compliant, to the extent CACC properly protects the information.ii. No improvement required

5. Learning Objectives:

2. The candidate will understand an actuarial appraisal.

Learning Outcomes:

- (2c) Describe risks associated with interpreting an actuarial appraisal and an embedded value.
- (2f) Calculate an embedded value

Sources:

Embedded Value: Practice and Theory

GHFV-133-19: Simple Embedded Value example

Commentary on Question:

This question challenged candidates to describe key aspects and uses of Embedded Value as well as calculating Embedded Value.

Solution:

- (a) List how companies routinely use Embedded Value (EV).

Commentary on Question:

Candidates generally did well listing uses in part A. Most candidates received full or nearly full credit for this part.

- Justification for stock prices and acquisition purchase prices
 - Performance measurement for executive compensation
 - Profitability analysis for lines of business
 - Assessment of returns for capital allocation purposes
- (b) Describe how to utilize the following broad categories for an analysis of movement that decomposes the change in EV.
 - (i) Contribution from new business
 - (ii) Contribution from in-force business
 - (iii) Contribution from free surplus
 - (iv) Capital movements

5. Continued

Commentary on Question:

For part B some candidates had difficulty describing in more than a very general way how the items were used in an analysis of movement. Full credit was given to candidates that were specific in their descriptions; many candidates included formulas to further describe how categories are used in the analysis of movement. Candidates received additional credit for relevant commentary beyond what is listed below.

(i) Contribution from new business

- The value of new business can be calculated using:
 - beginning-of-period assumptions (which are consistent with a business plan),
 - point-of-sale assumptions (which are theoretically more accurate but difficult to include), or
 - end-of-period assumptions (which are consistent with external reporting)
- Expected Contribution of New Business defined as the present value of after-tax book profits less cost of capital attributed to new business: $NBEC_t = VNB_t * (1+RDR)^{0.5}$

(ii) Contribution from in-force business

- A roll-forward of the beginning of the period IBV is required and based on beginning-of-period assumptions.
- The process then arrives at an expected value at the end of the year, thus providing the expected increase due to in-force business (i.e. expected contribution to EV attributed to increase in IBV plus expected net income due to business in-force at the beginning of the period and excluding contribution from new business written during reporting period)

(iii) Contribution from free surplus

- Free surplus is the residual component of Adjusted Net Worth that is not required to support in-force business that resides in the company and is not distributed to shareholders.
- Expected return for FS is after-tax market rate of return (opposed to Required Capital which supports in-force business and expected to earn RDR or risk discount rate).

5. Continued

(iv) Capital movements

- Migration between RC and FS during the reporting period impacts the expected contributions of each.
- Typically analyzed at least quarterly, significantly mitigating the effects of capital migration between required capital and free surplus and any capital movements into and out of the company. (e.g. stockholder dividends, paid-in capital, surplus notes, new shares issued)

(c) Assess the accuracy of the following statements regarding setting assumptions related to EV by identifying which are true or false. Justify your answer.

- (i) It is appropriate to include provisions for adverse deviation for noneconomic assumptions.
- (ii) Noneconomic assumptions do not need to be consistent with the market's perception of these assumptions.
- (iii) For a company located in multiple territories, investment expenses reflect a single accounting methodology.
- (iv) Persistency rates are typically set by considering only a company's own experience, and not industry data.
- (v) It is unusual for a reinvestment assumption to be part of the investment return assumption.
- (vi) Two approaches commonly used for determining the risk discount rates when the cost of debt is reflected are the "top-down" approach and the "bottom-up" approach.

Commentary on Question:

Candidates generally did well on this question. A very small number of candidates did not label their responses as True or False; in rare cases a candidate simply replied True or False but did not justify the statement. Full credit was given for both the correct label True/False and supporting justification.

(I) FALSE; Noneconomic assumptions are intended to be best estimates, so it is not appropriate to include any provision for adverse deviation.

(II) TRUE; Noneconomic assumptions will generally include management's estimates and expectations of how experience may change in the future.

5. Continued

(III) FALSE; investment expenses would be expected to reflect the local territory accounting.

(IV) FALSE; while persistency rates rely on company-specific data, they also consider industry data, though to a lesser degree than either mortality or morbidity assumptions

(V) FALSE; unless assets are perfectly matched to the liabilities, it would be usual for a reinvestment assumption to be part of the investment return assumption.

(VI) TRUE; the top-down approach uses a risk margin based upon a group weighted average cost of capital while the bottom-up approach uses a product-based approach to reflect differences in risk inherent in each product group.

- (d) Calculate the expected EV rolled forward one year to December 31, 2022. Show your work.

Commentary on Question:

Maximum points are awarded if candidates provided the correct expected EV at December 31, 2022 using the roll forward methodology as outlined in the Simple Embedded Value Example study note (GHFV-133-19). Most candidates were not able to produce the roll forward calculations as outlined in the study note.

Partial credit was awarded for candidates that directly calculated the correct EV at December 31, 2022 using a net present value (or non-roll forward) method.

Partial credit was also given for correct components or correct latter formulas that would have yielded a good answer if fed the correct inputs.

5. Continued

Year	End of Year Premium	End of Year MCCR	End of Year Capital	Post-tax Target Profit	Post-tax Interest	Capital Cash Flow	Discounted Capital Cashflow EOY 0	Discounted Post-tax Profit EOY 0
0	\$5,000,000	\$412,500	\$618,750					
1	\$4,280,000	\$353,100	\$529,650	\$61,875	\$18,563	\$107,663	\$98,773	\$56,766
2	\$3,663,680	\$302,254	\$453,380	\$52,965	\$15,890	\$92,159	\$77,568	\$44,580
3	\$0	\$0	\$0	\$45,338	\$13,601	\$466,982	\$360,596	\$35,009

Roll forward from end of year 0 to end of year 1 (i.e. December 31, 2022)

	PV Post-tax Target Profit	PV Capital Releases and Interest	Capital Employed	Embedded Value
Values at EOY 0	\$136,355	\$536,937	\$618,750	
EV discount rate	\$12,272	\$48,324		
Expected profits & interest on capital	(\$61,875)	(\$18,563)		
Expected change in capital		(\$89,100)	(\$89,100)	
Expected Values at EOY 1	\$86,752	\$477,599	\$529,650	\$34,701

6. Learning Objectives:

3. The candidate will understand how to describe and evaluate government programs providing health and disability benefits in Canada.
5. The candidate will understand how to evaluate the impact of regulation and taxation on insurance companies and plan sponsors in Canada.

Learning Outcomes:

- (3a) Describe eligibility requirements for social programs in Canada and the benefits provided.
- (3b) Describe how private group insurance plans work within the framework of social programs in Canada.
- (5b) Describe the major applicable laws and regulations and evaluate their impact.
- (5c) Understand the impact of the taxation of both insurance companies and the products they provide.

Sources:

GHFV-628-17: The Quebec Act Respecting Prescription Drug Insurance and Its Impacts on Private Group Insurance Plans, 2016

GHFV-710-21: Termination of Benefits Coverage at Age 65 Declared Unconstitutional

GHFV-671-16: CHLIA Guideline G4 - Coordination of Benefits

Morneau Shepell Handbook of Canadian Pension Benefit Plans, 17th Edition, 2020, Ch. 19: Employment Insurance

Commentary on Question:

Understanding of QPIP, Maternity leave and EI is required for this question. Candidates needed to share the key components of these programs and their relationship.

Solution:

- (a)
 - (i) Describe the Tribunal conclusions in Cassel's paper.
 - (ii) Explain how the Tribunal decisions can be applied to ABC.

Commentary on Question:

Candidates generally were unable to fully describe the Tribunal's conclusions, but were able to partially apply the conclusions to ABC.

6. Continued

(i)

- The Tribunal concluded that the financial viability of workplace benefit plans can be achieved without making the age 65 and older employees vulnerable to the loss of employment benefits without recourse to a potential human rights claim. These workers' rights were found to be more than minimally impaired.
- The Tribunal also concluded that the benefits lost sought by the teacher (of approximately \$160,000) had no close relationship between health and dental costs and age.
- The Tribunal determined that there were other alternatives available to the government that would impair the rights of workers age 65 and older to a lesser degree. An example was to require that any age-based differentiations in benefits plans be reasonable and bona fide with a protection against undue hardship available to employers.
- The Tribunal did note that its decision is limited to group health, dental and life insurance benefits plans and that LTD and pension plans were not included in the constitutional challenge.

(ii)

- The decision by the Tribunal can be applied to the health plan and therefore ABC's health plan should not be terminated at age 65. The case was not limited to LTD, but could open the door to future challenges that allege age discrimination in relation to other group benefits, including Long Term Disability.

- (b) Explain the drug coverage choices for both Kevin and Ella when Kevin will attain age 65.

Commentary on Question:

Candidates were generally able to outline the choices for both Kevin and Ella in Quebec. The relationship between private plans and RAMQ is the key component to this question and candidates should be able to share the interplay between both programs.

- Upon reaching age 65, Kevin will automatically be registered for the public plan (RAMQ). Therefore, he can choose to be insured by the public plan only.
- When employees or retirees reach age 65, they continue to be eligible for coverage under a private group plan that covers prescription drugs as it cannot exclude persons based on their age. Thus, Kevin and Ella can still choose to be covered under the private plan which must offer at least basic coverage.
- They then can choose to be insured by the public plan as the first payor and by a private plan offering supplemental coverage as a second payor.

6. Continued

- If Kevin chooses to keep the private plan, Ella can still be covered under the private plan through ABC. If Kevin chooses the public plan only, Ella will lose coverage through ABC's private plan. If she is eligible for a different private plan, she must be covered under that private plan, if not, she'll be covered under the public plan.
- (c) Recommend which scenario from part (b) Kevin and Ella should select in order to minimize the out-of-pocket cost. State any assumptions and show your work.

Commentary on Question:

Candidates were able to determine the out-of-pocket costs for the public plan well. Some candidates were unable to determine the out-of-pocket expense for the private plan, but most did not include the appropriate premium taxes. Candidates mostly did not calculate the out-of-pocket expense for the environment for both the public and private plan together. Candidates needed to show understanding in how taxes may be applied to the private plan premiums.

	Public Plan pay	Private Plan Pay	Kevin pay	Premium	Tax	Total Premium Paid	Total
Scenario - public plan only	\$996.45	\$0.00	\$803.55	\$1,420.00	0.00%	\$1,420.00	\$2,223.55
Scenario -private plan only	\$0.00	\$1,620.00	\$180.00	\$1,122.00	9.00%	\$1,222.98	\$1,402.98
Scenario -both public and private	\$996.45	\$803.55	\$0.00			\$2,642.98	\$2,642.98

Kevin and Ella should choose the private plan only since the disbursed amount is the lowest compared to the other 2 options (i.e. public plan only and both public/private)

- Under the public plan:
 - Kevin pays = $12 \times (\text{minimum of } \$96.74 \text{ or } 35\% \text{ of } \$150 \text{ less } \$22.25)$
 - Under the private plan
 - Kevin pays = $\text{minimum of } \$1,000 \text{ or } 12 \times 10\% \times \150
- (d) Compare and contrast the maternity benefit under EI versus the Quebec Parental Insurance Plan (QPIP).

Commentary on Question:

Candidates were able to note some of the features of both Maternity EI benefits and QPIP, but did not provide enough information to gather full marks. To achieve full marks, candidates should show understanding in eligibility, length of benefits and the benefit amounts, including different options available.

- Similarity:
 - The maternity benefit under EI and QPIP is payable only to the biological mother.

6. Continued

- Differences:
 - Length of benefits:
 - Maternity benefits under EI are payable for a maximum 15 weeks.
 - There are no extended benefit options under EI
 - Maternity benefits under QPIP are payable for 18 weeks under the basic plan and 15 weeks under the special plan
 - Benefit Amount
 - Maternity benefits under EI has a basic benefit rate of 55% of the individual's average insured weekly earnings up to a maximum amount with a 1 week elimination period
 - QPIP benefits could be as high as 75% of average weekly income starting without a waiting period
 - Eligibility
 - To receive benefits under EI, the claimant is required to have worked for 600 hours in the last 52 weeks or since the last claim
 - Maternity benefits under QPIP, a QC resident who has a biological or adopted child needs to have at least \$2000 of insurable income during the reference period and must have stopped working or have seen a reduction of at least 40% in their usual employment income
- (e) Calculate the maximum pre-tax replacement ratio that Maria and Leo can receive during the first 52 weeks of the leave. State any assumptions and show your work.

Commentary on Question:

Many candidates did not attempt this question. Those who did generally were unable to adequately calculate all components of the benefit. Candidates needed to share an understanding of which parent should receive which benefit, which weekly earnings to consider and the length of benefits to receive full marks.

6. Continued

	Unemployment Rate	Number of Best Weeks Required for Benefit Calculation		
Toronto	7.9	20		
20 best weeks will be required to calculate the average weekly earnings for both Mario and Leo				
	Maria	Leo		
The sum of top 20 weekly earning	\$34,615	\$16,812		
Average weekly earning	\$1,731	\$841		
Average weekly benefit	\$652	\$462		
2023 maximum yearly insurable earnings		\$61,600		
Maximum weekly amount		\$652	Per week	
Starting 2023-01-01	Maria	Leo	Total	Replacement Ratio
Week 1	Maria starts to take maternity leave. EI one week elimination. Total income = one week salary from Leo			
	\$0	\$865	\$865	1%
Week 2-16	\$9,773	\$12,981	\$22,754	17%
	Parental leave:			
	To maximize the replace ratio, standard option must be chosen. 35 weeks for parental benefits if standard option is chosen. If the parental benefits are shared between the two partners, an additional five weeks are payable when choosing the standard option.			
Week 17-51	Maria	Leo	Total	Replacement Ratio
	\$22,804	\$30,288	\$53,092	39%
	\$60,577	\$16,181	\$76,758	57%
	In order to receive the maximum replacement ratio, it's better that Leo take the 35 weeks of parental leave.			
Week 52	If the parental benefits are shared, an additional five weeks are payable.			
	\$652	\$865	\$1,517	1%
Total Income in 2023	\$101,894			
Pre Annual Salary	\$135,000			
Replacement Ratio	75%			75%

7. Learning Objectives:

4. The candidate will understand how to prepare and be able to interpret insurance company financial statements in accordance with IFRS & IAS.

Learning Outcomes:

- (4a) Interpret insurer financial statements from the viewpoint of various stakeholders.
- (4c) Project financial outcomes and recommend strategy to senior management to achieve financial goals.
- (4g) Explain fair value accounting principles and describe International Accounting Standards (IAS).
- (4h) Construct basic financial statements and associated actuarial entries for a life and health insurance company.

Sources:

GHFV-698-21: Comparison of IFRS 17 to Current CIA Standards of Practice, Nov 2020

IFRS 17 Insurance Contract Examples

GHFV-712-22: IFRS 17 Expenses

Commentary on Question:

Understanding of insurance contracts in the context of IFRS was valuable to this question. Many candidates were able to set up the Reconciliation of Acquisition Expenses as well as Profit and Loss Statements, but lacked key components.

Solution:

- (a) Explain the IFRS 17 accounting treatment related to:
 - (i) Amounts on deposit
 - (ii) Experience rating
 - (iii) Claims fluctuation reserves / Premium stabilization reserves
 - (iv) Administrative Services Only (ASO) contracts

Commentary on Question:

Candidates were mostly unable to explain the IFRS accounting treatment for the various insurance features. There was limited understanding on treatment of the investment component and whether they were treated as distinct or non-distinct.

7. Continued

(i) Amount on Deposits

- Treated as either a distinct or non-distinct investment component.
- If distinct, would be separated from the insurance contract, measured under IFRS 9, and the liability would be included with other investment contract liabilities in the financial statements.
- If non-distinct, IFRS 17 applies and the liability would be included with insurance contract liabilities. Exclude from insurance revenue and insurance service expense.

(ii) Experience Rating

- Treated as a non-distinct investment component.
- Same as policy-holder share of the underlying (VFA).
- If there is no insurance risk (i.e. some have hold harmless agreements), the contract would be outside the scope of IFRS 17.

(iii) Claims Fluctuation reserves/Premium stabilization reserves

- Treated as either a distinct or non-distinct investment component
- If distinct, would be separated from the insurance contract, measured under IFRS 9, and the liability would be included with other investment contract liabilities in the financial statements.
- If non-distinct, IFRS 17 applies and the liability would be included with insurance contract liabilities. Exclude from insurance revenue and insurance service expense.

(iv)

- ASO – Pure
 - Treated as a service contract.
 - IFRS 15 applies to pure ASO since entity has no insurance risk and provides administrative, claims, and processing services, while the group contract holder assumes all the insurance risk, and pays for all services and claims.
 - Absent of any insurance features, IFRS 9 applies to any account balances.
- ASO – with insurance
 - AoD arising from annual accounting of the ASO might be a distinct investment component. If so, it would be separated, measured under IFRS 9 and included with other investment contracts in the financial statements.
 - The service component of the contract might be distinct under IFRS 17.34. If so, it would be separated, measured under IFRS 15, and included with other service contracts in the financial statements.
 - The remaining components of the contract would not be separated.

7. Continued

- Training and/or HR costs directly related to any of the above functions
 - Overhead attributed to issuance or renewal of insurance contracts
 - **Maintenance Expenses** – Expenses incurred with the primary purpose being the fulfilment of obligations under insurance contracts, such as:
 - Policy maintenance costs, including salaries of administration personnel, systems maintenance costs, and customer service costs
 - Claims settlement costs
 - Recurring commissions (e.g. related to recurring premiums)
 - Sliding scale and other profitability-based commissions (except if it qualifies as non-distinct investment components) (P&C Only)
 - Training and/or HR costs that were directly related to any of the above functions
 - Overhead attributed to the maintenance of the insurance contracts
- (d) You have decided to classify expenses related to investment management, asset liability management and risk management as directly attributable to insurance contracts. The auditor has questioned your classification of expenses.

Explain to the auditor why your rationale is correct.

Commentary on Question:

Candidates were generally unable to explain why the rationale is correct, but were able to identify that the interpretation of “directly attributable” may be up for a wider interpretation.

- The counter argument to the auditor is that an insurance entity couldn't plausibly fulfill its obligations under its insurance contracts without expenses such as investment management, asset liability management and risk management.
- Additionally, while the primary purpose of incurring these costs may not be acquisition of insurance contracts or fulfilling obligations under insurance contracts, neither is the primary purpose of overhead expenses (such as rent and HR costs), but these overhead costs are considered directly attributable under IFRS 17.B65(1).
- Thus, from this perspective, wider interpretation of the scope of “directly attributable” could be potentially adopted.

8. Learning Objectives:

6. The candidate will understand and evaluate post-retirement and post-employment benefits in Canada.

Learning Outcomes:

- (6b) Determine appropriate baseline assumptions for benefits and population.
- (6c) Determine employer liabilities, service cost and expense for post-retirement and post-employment benefits for financial reporting purposes under IFRS and understand differences compared to US GAAP.
- (6f) Apply actuarial standards of practice to post-retirement and post-employment benefit plans.

Sources:

GHFV-632-13: IAS19

GHFV-649-15: Comparison of IAS 19, Rev. 2011 with FASB ASC 715: Summary of Provisions Affecting Accounting for Postretirement Benefits

GHFV-650-15: Supplement Calculation Note for IAS 19

Commentary on Question:

Generally, candidates did well on this question. The main areas where candidates may have lost marks is properly applying the termination rates from an age service table and identifying that the calculation of DBO is based on service to full eligibility (and not to expected retirement).

Solution:

- (a) Calculate the following metrics for each of the sample employees:
 - (i) Present value of future benefits
 - (ii) DBO
 - (iii) Defined benefit cost for 2023

State any assumptions and show your work.

Commentary on Question:

Candidates generally did fairly well with majority of marks lost being the application of the age service termination table and using service at retirement instead of service at eligibility for determining DBO.

8. Continued

(i) Present value of future benefits (PVFB)

- Forest
 - $PVFB = \text{Retirement Allowance} * t_{px} * v^t$
 $= \$44,000 * (1-0.34\%) * (1-0.3\%) * (1-0.28\%)$
 $\quad * (1/((1+2.5\%)^3))$
 $= \$40,484$
- Priyanka
 - $PVFB = \$0$
⇒ member would not be eligible at expected retirement age
- Catherine
 - $PVFB = \$50,000 * (1-1.05\%) * (1-1.01\%) * (1-0.96\%) * (1-0.9\%)$
 $* (1-0.84\%) * (1-0.74\%) * (1-0.64\%) * (1-0.54\%) * (1-0.51\%) * (1-$
 $0.46\%) * (1-0.47\%) * (1-0.45\%) * (1-0.4\%) * (1-0.21\%) * (1-0.22\%) * (1-$
 $0.23\%) * (1-0.23\%) * (1-0.24\%) * (1-0.01\%)^{11} * (1/((1+2.5\%)^{29}))$
 $= \$22,054$

(ii) DBO

- Forest
 - $DBO = \text{Current Service} / \text{Total Service at Full eligibility} * PVFB$
 $= (19 / 22) * \$40,484$
 $= \$34,963.13$
- Priyanka
 - $DBO = \$0 \rightarrow$ not eligible
- Catherine
 - $DBO = (13 / 31) * \$22,054$
 $= \$9,248.32$

(iii) Define benefit cost for 2023

- Forest
 - $\text{Defined Benefit Cost} = \text{Service Cost} + \text{Interest Cost}$
 $= (DBO / \text{Current Service}) + (i * (DBO + \text{Service Cost}))$
 $= (\$34,963.13 / 19)$
 $\quad + (2.5\% * (\$34,963.13 + (\$34,963.13 / 19)))$
 $= \$2,760.25$

8. Continued

- Priyanka
 - Defined Benefit Cost = \$0
- Catherine
 - Defined Benefit Cost
 - = $(\$9,248.32 / 13)$
 - + $(2.5\% * (\$9,248.32 + (\$9,248.32 / 13)))$
 - = \$960.40

- (b) Construct a *Reconciliation of Defined Benefit Obligation* for the December 31, 2023 disclosure using the aggregated results of the three sample cases. State any assumptions and show your work.

Commentary on Question:

Candidates were required to recalculate the go-forward liability (Forest only) at 3% as part of the reconciliation of DBO.

- Remeasurement at 3% for the only remaining liability for Forest:
 - DBO
 - = $(20 / 22) * \$44,000 * (1 - 0.30\%) * (1 - 0.28\%) * (1 / ((1 + 3\%)^2))$
 - = \$37,485

Reconciliation of defined benefit obligation

Defined benefit obligation at start of period	\$44,211
Current service cost	\$2,551.57
Benefit payments	\$0
Past service cost	\$0
Settlement (gains)/losses	\$0
Interest expense	<u>\$1,169.08</u>
Expected defined benefit obligation at end of period	\$47,932
Actuarial (gains)/losses	<u>(\$10,447)</u>
Defined benefit obligation at end of period	\$37,485

8. Continued

- (c) Calculate the sample cases' total gain/loss recognition for 2024. State any assumptions and show your work.

Commentary on Question:

Points were awarded even if candidates used 10% of APBO at EOY. If EOY is used, then 2024 amortization amount would be -\$3,339.90.

Answer:

Under ASC 715, gains and losses can be recognized immediately or delayed:

10% of APBO:	\$4,421.14
Amount greater than 10% of APBO:	\$6,025.48
Expected remaining service period for Forest (only one eligible to receive benefit out of sample cases):	2
Amount recognized in 2024:	(\$3,012.74)

- (d) Due to the global pandemic, Company XYZ had to close down one of its locations and lay off all employees at that location. Management states that these changes will result in a remeasurement effect recognized through Other Comprehensive Income (OCI), with no recycling.

Critique management's statement, considering IAS 19.

- What occurred is actually considered a curtailment and is treated differently than a remeasurement effect under IAS 19
- A curtailment is a significant reduction in number of employees covered by plan due to an isolated event, discontinuance of operations, termination or suspension of plan
- Change is measured in the DBO and DBO must be remeasured using current assumptions before measuring curtailment effect
- Included with the past service cost in service cost rather than OCI

9. Learning Objectives:

5. The candidate will understand how to evaluate the impact of regulation and taxation on insurance companies and plan sponsors in Canada.

Learning Outcomes:

- (5c) Understand the impact of the taxation of both insurance companies and the products they provide.

Sources:

GHFV-644-22: TACCESS: An Advisor's Guide to Understanding How Taxes Impact Group Insurance Benefits in Canada

GHFV-647-15: Protecting Canadians' Long Term Disability Benefits

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe the tax implications in Alberta and Quebec for each benefit provided to the employee:
 - (i) on premiums paid by the employer
 - (ii) on benefits received by the employee

Commentary on Question:

Candidates should describe the tax implications from an employee's perspective to get full credits. While a chart was not required, full marks were awarded for candidates that successfully described all four benefits (Group Life, Long Term Disability, AD&D and Medical).

9. Continued

	Premium Paid by Employer	Benefits Received by Employee
Group Life	Premiums paid by the employer create taxable income for employees.	Benefits received are not considered taxable.
Long Term Disability	Premiums paid by the employer do not create taxable income for employees.	Benefits received are considered taxable income since the employer pays for premiums.
Accidental Death and Dismemberment	Premiums paid by the employer create taxable income for employees.	Benefits received are not considered taxable.
Medical	Premiums paid by the employer do not create taxable income for employees in Alberta. However, it is taxable to employees in Quebec.	Benefits received are not considered taxable.

- (b) Calculate the different taxes that Meg's Eggs will have to pay to the Governments of Alberta and Quebec. State any assumptions and show your work.

Commentary on Question:

Partial points were given if the candidate did not use the appropriate tax rates (i.e., premium tax of 3.0% for Alberta and 3.48% for Quebec, and QRST of 9.0%).

<p>Step 1 – Calculate the taxes in Alberta</p> <ul style="list-style-type: none"> • Premium tax = $\\$158,400 \times 3.00\% = \\$4,752$ • Retail Sales Tax (RST) = $\\$0.00$ • Total tax = $\\$4,752 + \\$0.00 = \\$4,752$
<p>Step 2 – Calculate the taxes in Quebec</p> <ul style="list-style-type: none"> • Premium tax = $\\$87,600 \times 3.48\% = \\$3,048$ • Quebec Retail Sales Tax on Insurance Premium (QTIP) = $\\$87,600.00 \times 9\% = \\$7,884$ • Total tax = $\\$3,048 + \\$7,884 = \\$10,932$

- (c) Explain to Meghan the advantages and disadvantages of a self-insured LTD plan.

Commentary on Question:

Any reasonable answers were awarded credit.

9. Continued

Disadvantages	<ul style="list-style-type: none">• Plan sponsors are not required to set up a reserve and rely on cash flow each year to pay disability claims• During tough financial times, it would be difficult to ensure employees currently on disability would be protected.• In the event of insolvency or bankruptcy, often no funds are set aside to continue paying benefits in the future.
Advantages	<ul style="list-style-type: none">• There are immediate cost savings from not being required to set up a reserve• Potential cost savings from the pay-as-you-go model. Instead of being required to pay a premium each year, they are only required to pay the claims as they come• Potential to also earn a greater return by more aggressively investing their funds themselves, rather than turning them over to an insurer to fund a reserve

10. Learning Objectives:

5. The candidate will understand how to evaluate the impact of regulation and taxation on insurance companies and plan sponsors in Canada.

Learning Outcomes:

- (5b) Describe the major applicable laws and regulations and evaluate their impact.
- (5c) Understand the impact of the taxation of both insurance companies and the products they provide.

Sources:

Canadian Insurance Taxation, Swales, et. al., 4th Edition, 2015

- Ch. 6: Reserves (pp. 79-96)
- Ch. 9: Investment Income Tax (pp. 135-142)

GHFV-637-13: Ch. 16 and 17 of Canadian Life & Health Insurance Law, Jones, H. E

GHFV-705-20: Assuris for Group Insurance in Canada

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe how benefits provided by Pinewood will be protected by Assuris in case of insolvency.

Commentary on Question:

Most candidate appropriately described the group life and disability benefit guarantee. Candidates needed to describe all four benefits below to receive full marks.

Group Life:

- Benefit guarantee: greater of \$200,000 or 85% of death benefit

Disability Insurance:

- Benefit guarantee: greater of \$2,000 per month or 85% of monthly income benefit
- If the benefit is quarterly or annual, the minimum guarantee is prorated to \$6,000 per quarter or \$24,000 per year
- If the benefit is increasing or decreasing over time, the amount of benefit in force at the date the company fails will be used to determine Assuris protection. After transfer, the protected benefits will continue to change in accordance with the terms of the policy

10. Continued

Supplemental Medical Benefits:

- Benefit guarantee: greater of \$60,000 or 85% of coverage benefit
- The Assuris protection covers the insurer's obligations according to the benefit plan. The member is still responsible for cost sharing and claims in excess of any annual and internal limits.

Ancillary Benefits

- The guarantee on the Critical illness is the same as for health expense
- The guarantee on LTC policy is the same as for monthly disability income.
- The guarantee for other unique products is dictated by whether they would most closely be categorized as monthly income, cash value, or health expense.

- (b) Calculate Pinewood's life insurance investment income tax for Year 4. State any assumptions and show your work.

Commentary on Question:

Partial marks were awarded for using the right formula and accurately showing all the components that make up the investment income tax.

MTAR Calculation		December 31, Year 3	December 31, Year 4
	reserve in respect to life insurance policies	\$2,269,000	\$2,469,000
	unearned premium reserves (UPR) in respect of group term policies	\$506,000	\$491,000
+	unpaid claims reserves	\$0	\$0
+	experience rating refund reserve (ERR)	\$245,000	\$506,000
=	Maximum Tax Actuarial Reserves (MTAR)	\$3,020,000	\$3,466,000

Investment Income Tax Calculation

	life investment income	
+	Experience Rating Refund (ERR) reserve adjustment	
-	amounts reported to policyholders as includable in income of the policyholder	
=	Canadian life investment income or loss for the year	
-	Canadian life investment loss carryforward	
=	taxable Canadian life investment income	
x	15%	
=	Investment Income Tax	

		Year 4
	insurer's average MTAR for its taxable life insurance policies for the year	\$3,243,000
	prescribed yield	1.65%
	Life Investment Income	\$53,510
	Experience rating refund reserve adjustment	(\$6,196)
	Amounts reported to policyholders as includable in income of the policyholder	\$0
	Canadian life investment loss carryforward	\$0
	Taxable Canadian life investment income	\$47,314
	Investment Income Tax	\$7,097

10. Continued

- (c) Assess the consequences of this misreporting on the merger.

Commentary on Question:

Many candidates received partial marks for this question. Any reasonable answers were awarded credit.

- Pinewood has overstated their life IIT. As a result, they may be understating their net income, as IIT is a deduction from income for a life insurance business.
- Pinewood may be paying the incorrect installments under the compliance requirements.

- (d) List and describe the standard policy provisions that Royale Pine would need to include in their group life insurance policy to ensure they are aligned with the Canadian market.

Commentary on Question:

Candidates were able to list some standard policy provisions. At least 8 points needed to be listed and described to receive full marks.

- **Entire contract** – the group policy, the policyholder’s application for the policy, and any application for coverage under the policy will constitute the entire contract between the insurer and the policyholder
- **Grace period** – all group life insurance policies will provide a grace period of at least 30 days for the payment of all renewal premiums
- **Termination of an individual’s coverage** – include provisions that describe when a group insured’s coverage becomes effective and when that coverage terminates
- **Termination of the policy** – a policyholder may decide to terminate a group life insurance policy at any time
- **Conversion** – when a group life insured’s coverage terminates, he or she can obtain replacement coverage even if he or she is then uninsurable
- **Benefit amounts** – the benefits payable upon the death of group life insureds must be fixed according to a non-discriminatory schedule
- **Beneficiaries** – in group life insurance, it is the group insured who has the statutory right under the Uniform Act to designate the beneficiary; Quebec does not grant a statutory right to anyone to designate the beneficiary
- **Settlement options** – the beneficiary usually receives the policy proceeds in a lump sum
- **Assignment** – many group insurance contracts prohibit a group insured from assigning rights under the contract

11. Learning Objectives:

3. The candidate will understand how to describe and evaluate government programs providing health and disability benefits in Canada.

Learning Outcomes:

- (3a) Describe eligibility requirements for social programs in Canada and the benefits provided.
- (3b) Describe how private group insurance plans work within the framework of social programs in Canada.

Sources:

Morneau Shepell Handbook of Canadian Pension Benefit Plans, 17th Edition, 2020, Ch. 2: Government Pension Programs (pp. 44-64, Canada & Quebec Pension Plans)

Commentary on Question:

This question was testing the candidate's ability to understand the changes to the CPP/QPP programs starting in 2019. It was important for candidates to both understand how the new structure works as well as know what the specific contribution rates and maximums are. Candidates did well on certain parts of the question, but struggled to put it all together.

Solution:

- (a) List and describe the types of benefits provided by the Canada and Quebec Pension Plans (CPP/QPP).

Commentary on Question:

Full credit was given for answering survivor benefit or benefit for dependent children. Many other descriptions were accepted.

- Retirement Pension
 - The normal commencement age for a CPP/QPP retirement pension is age 65, but early retirement is possible for a pension contributor who has reached the age of 60.
- Disability Benefits
 - CPP/QPP disability benefits comprise a pension to the disabled contributor and a pension to dependent children who meet certain conditions.
- Survivor Benefits
 - Under a CPP/QPP, survivor benefits are paid to a surviving spouse or common-law partner, dependent children, and a deceased contributor's estate.
 - There are three different types of benefits: the survivor's pension, the dependent children's benefit and death benefits.

11. Continued

- Death Benefits
 - A lump-sum death benefit is also payable upon the death of a contributor, under the same eligibility provisions as for the survivor pension.
- (b) In 2016, the Canadian Federal and Provincial Finance Ministers agreed to expand the Canadian Pension Plan (CPP) between years 2019 and 2025.

List the key developments as a result of this agreement.

Commentary on Question:

Candidates needed to mention 4 out of the 5 items below to get full credit.

- The CPP replacement rate on pensionable income was set to increase from 25% to 33% on service accrued after January 1, 2019. This change is being phased-in over a five-year period from 2019 to 2023.
 - Over the same five-year period (from 2019 to 2023), the basic CPP contribution rate on earnings up to the YMPE is being increased by 1% for both employers and employees (increasing from 9.9% in year 2018 to 11.9% in year 2023).
 - A new tier of pensionable earnings will be introduced in 2024 called the Year's Additional Maximum Pensionable Earnings (YAMPE). The YAMPE will be 107% of the YMPE in 2024 and will be 114% of YMPE in 2025 and thereafter.
 - The contribution rate on pensionable earnings above the YMPE and below the YAMPE will be 4% of earnings for both employers and employees (8% in total), and these contributions will be tax-deductible, as opposed to being eligible for tax credits.
 - In 2017, the Quebec government tabled new provisions to enhance the QPP. The provisions of the additional QPP components are practically identical to the provisions of the CPP expansion and additional CPP components.
- (c) Calculate the difference in Another Day's CPP contributions for its current active employees between year 2018 before CPP enhancements and 2025 after changes are fully implemented. State any assumptions and show your work.

Commentary on Question:

Many candidates missed the YAMPE or incorrectly applied it. Many candidates incorrectly increased the contribution rate to 12.9% instead of 11.9% in 2025.

11. Continued

The CPP contribution rate will increase gradually every year from 2010 to 2023. The new tier of pensionable earnings will be introduced in 2024 and will be fully implemented in 2025. Therefore, prior the enhancement is year 2018 and after the enhancement is year 2025.

Age	Annual Salary	Total	2018		2025			Difference	1 point for no contribution for age 75. *Contributions for the CPP/OPP are required from persons who earn in excess of \$500 annually from attainment of age 18 to the date of death, commencement of retirement pension, or attainment of age 70, whichever comes first.*	YBPE	YMPE	Contribution Rate	Another Day's contribution Rate
			Maximum Contribution Earnings YBPE	Another Day's Contribution	Maximum Contribution Earnings YBPE	New tier	Another Day's Contribution - first tier						
25	\$50,000	225	\$46,500	\$517,894	\$46,500	-	\$22,519	\$0					
35	\$65,000	400	\$52,400	\$1,037,520	\$61,500	-	1,463,700	\$0					
45	\$80,000	425	\$52,400	\$1,102,365	\$71,630	4,870	1,811,840	\$82,792	2018	\$3,500	\$55,900	9.9%	4.95%
53	\$85,000	15	\$52,400	\$88,907	\$71,630	9,870	63,930	\$5,922	2025	\$3,500	\$75,130	11.90%	5.95%
55	\$100,000	325	\$52,400	\$842,985	\$71,630	10,518	1,385,142	\$136,736	Assuming there is no change in YBPE in year 2025. 11.9% is from the amendments.				
57	\$90,000	10	\$52,400	\$25,938	\$71,630	10,518	42,600	\$4,201	2025 There is an additional tier of pensionable earnings. Additional Contribution. Another Day's contribution Rate				
65	\$105,000	75	\$52,400	\$194,535	\$71,630	10,518	\$19,648	\$11,255	YAMPE	\$85,648	8%	9%	
75	\$110,000	25	\$0	\$0	\$0	-	-	\$0	YAMPE	\$75,130			
Total		1,500		\$3,740,144			\$5,708,899	\$361,713					

- (d) Calculate the monthly CPP disability benefits payable to John. State any assumptions and show your work.

Commentary on Question:

Candidates did either very well or very poor on this part. Candidates either knew the formulas for disability benefit or did not.

- Step (1) Calculating the adjusted average pensionable earnings (2018-2022): \$59,700
- Step (2) For each month in the contributory period, the adjusted pensionable earnings are calculated by multiplying the actual pensionable earnings for the month by the ratio of the average YMPE for the retirement year to the YMPE for the year in which the earnings were paid.
- Step (3) Total the adjusted monthly pensionable earnings for the whole contributory period and then divide the total by the number of months in the period to give the average adjusted monthly pensionable earnings: \$3,766
- Step (4) The monthly CPP retirement pension is 25% of the average monthly adjusted pensionable earnings and it is capped at the maximum of $\$940.19 / 0.75 = \$1,253.59$
 \Rightarrow CPP retirement pension = $\text{Min} (\$3,766 \times 25\%; 1,253.59) = \941.57
- Step (5) Monthly CPP disability benefit for John is equal to a flat-rate pension plus an earnings-related component equal to 75% of the contributor's retirement pension: $\$524.64 + 0.75 \times \$941.57 = \$1,230.82$
 \Rightarrow CPP disability benefit = $\text{Min} (\$1,464.83; \$1,230.82) = \$1,230.82$

- (e) Explain two possible reasons for Ella's rejection for CPP disability benefits. Justify your answer.

Commentary on Question:

Only 2 of the 3 points were needed for full marks. Few candidates incorrectly said Ella was not a resident and therefore did not receive CPP benefits, which would not be true since eligibility relies on the years of contribution.

11. Continued

- Eligibility: He or she must have contributed to the CPP in four of the last six years on earnings that are at least 10% of the YMPE to be entitled to these disability pensions under the CPP.
 - Comment: As Ella started CPP contribution from 2020, she only contributed to the CPP less than 3 years. Therefore, she is not eligible."
- Eligibility: Bill-36 reduced the CPP contribution requirement to three of the last six years, but only if a contributor has contributed for at least 25 years.
 - Comment: As Ella only started to make CPP contributions from 2020, she is not eligible."
- Eligibility: These pensions are payable to a contributor who has a severe and permanent disability, and the contributor is unable to engage in any substantially gainful occupation with earnings in excess of \$5,800 per year in 2020.
 - Comment: Ella's condition is not provided. Even though she qualifies for disability benefits under Another Day's plan, her disability status may not meet the severe or permanent threshold of the CPP plan."

12. Learning Objectives:

4. The candidate will understand how to prepare and be able to interpret insurance company financial statements in accordance with IFRS & IAS.

Learning Outcomes:

- (4a) Interpret insurer financial statements from the viewpoint of various stakeholders.
- (4b) Evaluate key financial performance measures used by life and health insurers for both short and long-term products.
- (4c) Project financial outcomes and recommend strategy to senior management to achieve financial goals.
- (4h) Construct basic financial statements and associated actuarial entries for a life and health insurance company.

Sources:

Group Insurance, Skwire, Daniel D., 8th Edition, 2021, Ch. 43: Analysis of Financial and Operational Performance

Commentary on Question:

Most candidates got full marks on part A, but failed to discuss the deterioration of the DuPont formula components in enough detail to get full marks for part B. Few were able to identify and describe the types of financial analyses asked in part C. For parts D and E, common mistakes included using the wrong revenue (the question referred to individual business only but many included group) and using the wrong Member Months.

Solution:

- (a) Calculate the following metrics for Year 3 and Year 4:
 - (i) Total leverage ratio
 - (ii) Total asset turnover
 - (iii) Net profit margin
 - (iv) Return on assets
 - (v) Return on equity

State any assumptions and show your work.

Commentary on Question:

Candidates did very well on these calculations.

12. Continued

	Year	3	4
Data from Quantum Income Statement and Balance Sheet	Revenue	97,419	88,203
	Net Income	4,659	1,820
	Total Assets	40,002	40,291
	Shareholder Equity	19,861	20,519

Calculated Responses	Total Leverage Ratio	201.4%	196.4%
	Total Asset Turnover	243.5%	218.9%
	Net Profit Margin	4.8%	2.1%
	Return on Assets	11.6%	4.5%
	Return on Equity	23.5%	8.9%

- (b) Explain the deterioration between Year 3 and Year 4 using the DuPont formula. Justify your answer.

Commentary on Question:

Candidates generally identified that ratios were deteriorating, however, they did not interpret what drove this deterioration.

12. Continued

Return on Assets (Deterioration)

Net income has decreased because of the deterioration in revenue of the legacy block. The assets to support the liabilities and business have remained the same. This would indicate that the runoff has not been as good as expected on the legacy business.

Total Leverage Ratio (Deterioration)

Total assets have remained flat from year 3 to year 4 while the shareholder equity has grown. Likely Quantum's position on leveraging their shareholder investment has become more conservative as results have deteriorated.

This indicates that there are a number of fixed assets supporting the long-term legacy debt.

Return on Equity (Deterioration)

Net income has dropped year over year and shareholder equity has risen. The deterioration in net income is attributed to revenues dropping \$9M while expenses dropped by \$5M and offset by tax of \$1.5M. (Total of \$2.5M)

Total Asset Turnover (Deterioration)

Revenues have dropped significantly between years 3 and 4 which was driven by the deterioration of the grandfathered block revenues. The assets to support the liabilities and business have remained the same. This would indicate that the runoff has not been as good as expected on the legacy business.

Net Profit Margin (Deterioration)

Net income has dropped at a faster rate than revenues. The deterioration in net income is attributed to revenues dropping \$9M while expenses dropped by \$5M, offset by an improvement in tax of \$1.5M (total of \$2.5M)

- (c) List and describe the types of financial analysis where ratios in part (a) can be applied.

Commentary on Question:

In order to receive full marks, candidates were expected to identify how the ratios can be used. Candidates were able to identify different types of reporting, which may leverage these ratios. However, in order to receive full marks, it was important to qualify the usefulness of the various types of reporting.

12. Continued

Year-over-Year
<ul style="list-style-type: none">• This analysis looks at financial ratios over different twelve-month periods.• Year-over-year variances can be identified and remedied, especially using same size income statements.• Comparing similar twelve-month periods has the virtue of eliminating the effects of seasonal patterns.
Comparisons with Other, Similar Enterprises
<ul style="list-style-type: none">• By comparing with similar insurers, a health plan can identify whether it operates at best practice and set best practice goals if it does not.• Insurers being compared should have similar business models, offer similar products, and perhaps also have similar operational philosophies.• Having similar geographic focus and capital cost conditions is also helpful.• While economies of scale are generally limited to a few functions and a modest impact, achieving similarity in size may enhance comparability.
Financial Planning and Analysis
<ul style="list-style-type: none">• Financial planning and analysis involves establishing goals and measuring performance relative to those goals. There are analytical advantages to selecting a single metric to maximize, say return on equity and growth, and employing the financial ratios to support this analysis.• The process of financial planning and analysis occurs prospectively, in an annual or long-term budget, and then retrospectively, through a review of how performance compares to these objectives. In this way, financial planning complements financial analysis.
Operational Expense Analysis
<ul style="list-style-type: none">• Looks at the operational performance of individual aspects of the business from Rating and Underwriting, Product Development / Market Research, Sales and Marketing (Except Advertising and Promotion), Commissions (External), Advertising and Promotion, Enrollment / Membership / Billing, Customer Services, Provider Network Management and Services, Medical Mgmt. / Quality Assurance / Wellness, Claim and Encounter Capture and Adjudication, Total Information System Expenditures (As Expensed), HIPAA, Finance and Accounting, Actuarial, Corporate Services (HR, Facilities, Legal, Regulatory), Corporate Executive / Governance, and Association Dues and License/Filing Fees• Typically starts with an expense and headcount review.

12. Continued

- (d) Create the same-size income statements for Year 4 for the following individual plans:
- (i) HMO plans
 - (ii) PPO plans
 - (iii) Grandfathered plans

State any assumptions and show your work.

Commentary on Question:

Candidates needed to use the individual plan figures in order to receive full marks.

Revenues	Revenue Splits			Total
	HMO	PPO	Grandfathered	
Premium Revenues	22,637	6,407	18,780	47,824
Administrative fees income	9	3	8	20
Miscellaneous income	498	141	413	1,052
Net investment income	392	111	325	828
Total Revenues	23,536	6,662	19,526	49,724
Expenses	Individual HMO	Individual PPO	Individual Grandfathered	Total
Benefit Expenses	19,500	5,574	15,860	40,934
Commissions	451	128	374	953
General Insurance Expenses	2,789	789	2,319	5,897
Insurance taxes, licenses and fees, excluding federal income tax	498	141	413	1,052
Write-in	62	216	182	460
Total Expenses	23,300	6,848	19,148	49,296
Income before Tax	236	-186	378	428

12. Continued

Same-Size			
HMO	PPO	Grandfathered	Total
96.18%	96.17%	96.18%	96.18%
0.04%	0.05%	0.04%	0.04%
2.12%	2.12%	2.12%	2.12%
1.67%	1.67%	1.66%	1.67%
100.00%	100.00%	100.00%	100.00%
Individual HMO	Individual PPO	Individual Grandfathered	Total
82.85%	83.67%	81.23%	82.32%
1.92%	1.92%	1.92%	1.92%
11.85%	11.84%	11.88%	11.86%
2.12%	2.12%	2.12%	2.12%
0.26%	3.24%	0.93%	0.93%
99.00%	102.79%	98.06%	99.14%
1.00%	-2.79%	1.94%	0.86%

- (e) Create the per member per month (PMPM) income statements for Year 4 for the following individual plans:
- (i) HMO plans
 - (ii) PPO plans
 - (iii) Grandfathered plans

State any assumptions and show your work.

Commentary on Question:

General formula leverages the income statement from d) multiplied by 1,000 on the basis of the member per months.

12. Continued

	Per Member per Month			
Revenues	HMO	PPO	Grandfathered	Total
Member Months	52,550	25,740	145,800	224,090
Premium Revenues	430.77	248.91	128.81	213.41
Administrative fees income	0.17	0.12	0.05	0.09
Miscellaneous income	9.48	5.48	2.83	4.69
Net investment income	7.46	4.31	2.23	3.69
Total Revenues	447.88	258.82	133.92	221.89
Expenses	HMO	PPO	Grandfathered	Total
Benefit Expenses	371.08	216.55	108.78	182.67
Commissions	8.58	4.97	2.57	4.25
General insurance expenses	53.07	30.65	15.91	26.32
Insurance taxes, licenses and fees, excluding federal income tax	9.48	5.48	2.83	4.69
Write-in	1.18	8.39	1.25	2.05
Total Expenses	443.39	266.05	131.33	219.98
Income before Tax	4.49	-7.23	2.59	1.91

- (f) Propose four solutions to improve the financial performance of Quantum. Justify your proposal.

Commentary on Question:

Any reasonable answers were awarded credit.

12. Continued

Revenue Actions
<ul style="list-style-type: none">• Quantum could look at divesting in the legacy block or acquire another block to generate more revenue
<ul style="list-style-type: none">• Look to improve underwriting margin by repricing and increasing premium rates where they can
<ul style="list-style-type: none">• Grow larger margin business (HMO or PPO)
Expense Actions
<ul style="list-style-type: none">• Restructure compensation where possible
<ul style="list-style-type: none">• Review internal expenses required to support the business
<ul style="list-style-type: none">• Evaluate internal procedures to find ways to improve expenses and reduce headcount
<ul style="list-style-type: none">• Integrate technology solutions to improve customer experience and reduce costs.