

GH VRC Model Solutions

Fall 2023

1. Learning Objectives:

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

Learning Outcomes:

- (1a) Describe the types of claim reserves (e.g., due and unpaid, ICOS, IBNR, LAE, PVANYD).
- (1b) Explain the limitations and biases of the traditional valuation methods.
- (1c) Calculate appropriate claim reserves given data.
- (1e) Evaluate data resources and appropriateness for calculating reserves.

Sources:

Group Insurance Ch 39, GHVR-103-16 Health Reserves

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a)
 - (i) Describe the Tabular method, Examiner's method, and Factor method.
 - (ii) Explain for which lines of business it is appropriate to use each method.

Commentary on Question:

Most candidates were able to describe the three methods, but had difficulty in part ii) of identifying appropriate lines of business for the examiner's method and factor method.

- (i)

Tabular method –

Under this method, a reserve is computed for each claim (rather than for the block as a whole), using a table of expected recovery and mortality rates. The actuary projects future benefits expected to be paid to the claimant, and then determines the present value of those benefits, discounting for recovery and mortality (using the tabular rates) as well as for interest.

1. Continued

Examiner's method –

Under this method, claim department or other qualified personnel are asked to estimate the remaining claim payments expected on known claims, based on the characteristics of each claim.

Factor method –

This method is generally used for reserves that are easily estimated due to a short lag or run off period. Utilizes historical factor (percent of premium, claims PMPM factor etc.) to project future ultimate claims.

(ii)

Tabular method – This method is used for long term products such as long term disability and long term care.

Examiner's method –

This method can be used for the following types of products:

Short Term Medical Products

- to estimate very large catastrophic claims.

Short Term Disability and Hospital Income

- where the present value of amounts not yet due is easily estimated and not particularly impacted by termination rates or other contingencies.

Factor method –

This method is used for Group Life and Medical Products.

- (b) Recommend whether the development method is appropriate for each scenario. Justify your answer.

Commentary on Question:

Most candidates received partial credit on this section.

Table 4 presented a challenge to many candidates as they looked only at the lag patterns and not the claims volume that was changing significantly. Some candidates did not provide a recommendation, but instead gave pros and cons. If no recommendation was given, then no points were awarded for that scenario.

Table 1

- No, the development method is not appropriate.

The lag patterns are not consistent in the progression of claims from incurred date to ultimate date. The claim pattern is too erratic to use the development method.

Table 2

- Yes, the development method is appropriate.

The lag patterns appear to be consistent with smaller amounts of paid claims in later lag periods. The duration appears to be within a 1-year timespan which is considered a shorter duration. Claim levels indicate that this is a large enough block of business to deem credible.

1. Continued

Table 3

- No, the development method is not appropriate.

It is not clear when the ultimate date will be or what the ultimate claims amount will be in order to calculate the completion factors to be used in the development method

Table 4

- No, the development method is not appropriate.

While lag patterns appear consistent, the problem is the block appears to be either growing rapidly or has issues with credibility. It is unclear if the current payment pattern will hold in later months with higher claim volume.

- (c) Recommend the incurred month to be used as the basis for an age-to-ultimate development factor reserve. Show your work and justify your answer.

Commentary on Question:

Most candidates did well on this section. Below is a solution, but other selected months with appropriate justification that met the Chief actuary's criteria are acceptable.

January has an unusual payment in month 12 that does not seem to be representative of the other months.

The chief actuary requires at least 10 months to be used, which eliminates using May through December.

Recommend using Feb as it has the most months of data otherwise.

- (d) Calculate the IBNR as of January 31, 20X2 using your recommendation from (c). Show your work.

Commentary on Question:

The solution in the attached excel file is based on having chosen February as the reserve month. Other solutions are acceptable based on the month recommended in part c. See excel file.

- (e) Calculate the total case reserve for the members in Exhibit 3. Show your work.

Commentary on Question:

Since the contract terms for Hospital C and D are based on an average cost per day, the length of stay for members at those hospitals needs to be calculated in the actual number of days. Some candidates used 30 days for all months instead of the calendar days that each month has. Also, if the length of stay below plus 1 was used, then this was an acceptable answer. Many candidates did not apply the stop loss correctly for member 4 to limit the financial limit to \$300,000 across both hospital stays.

1. Continued

		A)	B)	C) = 12/31- B)	D) = Hosp A and B	E) = Hosp C and D	F) = A)*D) + C)*E)	G) = Min \$300k, F) per member
Mbr ID	Hosp	Billed Amt	Admit Date in 20X2	LOS	Discount	Cost per day	Expected Claims	With Financial Limit Applied
1	A	\$944,647	9/1		0.6		\$566,788.20	\$300,000.00
2	B	\$928,492	9/1		0.4		\$371,396.80	\$300,000.00
3	C	\$505,729	11/1	60		4000	\$240,000.00	\$240,000.00
4*	B	\$501,205	9/1		0.4		\$200,482.00	\$200,482.00
4*	D	\$849,032	11/1	60		2500	\$150,000.00	\$99,518.00
5	A	\$747,554	9/1		0.6		\$448,532.40	\$300,000.00
6	B	\$948,928	9/1		0.4		\$379,571.20	\$300,000.00
7	C	\$524,505	10/1	91		4000	\$364,000.00	\$300,000.00
8	D	\$819,454	10/1	91		2500	\$227,500.00	\$227,500.00
9	C	\$530,468	10/1	91		4000	\$364,000.00	\$300,000.00
10	D	\$943,329	9/1	121		2500	\$302,500.00	\$300,000.00
11	A	\$696,121	11/1		0.6		\$417,672.60	\$300,000.00
12	B	\$816,868	9/1		0.4		\$326,747.20	\$300,000.00
13	C	\$946,993	9/1	121		4000	\$484,000.00	\$300,000.00
14	D	\$658,236	10/1	91		2500	\$227,500.00	\$227,500.00
15	A	\$850,079	11/1		0.6		\$510,047.40	\$300,000.00
16	B	\$868,005	9/1		0.4		\$347,202.00	\$300,000.00
17	C	\$845,355	9/1	121		4000	\$484,000.00	\$300,000.00
18	D	\$639,030	10/1	91		2500	\$227,500.00	\$227,500.00
19	C	\$557,874	9/1	121		4000	\$484,000.00	\$300,000.00
20	D	\$550,065	10/1	91		2500	\$227,500.00	\$227,500.00
							Total =	\$5,650,000

Mbr 4 has 2 hospital stays so the second visit is capped at \$300K - \$200,482 = \$99,518.00

2. Learning Objectives:

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

Learning Outcomes:

- (3a) Describe the regulatory and policy making process in Canada.
- (3b) Describe the major applicable laws and regulations and evaluate their impact.
- (5a) Describe eligibility requirements for social programs in Canada and the benefits provided.
- (5b) Describe how private group insurance plans work within the framework of social programs in Canada.

Sources:

GHVR-706-20: PMPRB-Framework Modernization

Biosimilars in Canada: Building Momentum in the Wake of Recent Switching Policies

GHVR-717-F23: Expert Panel: How National Dental Care Could Impact Group Benefits Plans

Commentary on Question:

This question focused on testing candidates' understanding of the PMPRB and National Dental Program. Candidates that excelled at this question demonstrated a well-rounded understanding of how each of these frameworks worked.

Solution:

- (a)
 - (i) Describe the mandate of the Patented Medicines Prices Review Board (PMPRB).
 - (ii) List challenges faced by the PMPRB.

Commentary on Question:

Not all points listed below was required for full credit. Many candidates focused on cost-related issues for the PMPRB. Pointing out PMPRB's involvement with research and development for part (i) and pointing out non-cost related aspects of challenges (i.e., Dated framework) for part (ii) was required for full credit.

2. Continued

- (i)
 - To ensure that prices at which patentees sell their patented medicines in Canada are not excessive.
 - To report on pharmaceutical trends of all medicines and on research and development spending by patentees.

- (ii)
 - Canadian payers struggle to cope with the influx of high-cost drugs and often have to ration access.
 - Given the systemic fragmentation, Canada is unable to leverage the national buying power in the same way as other countries.
 - All payers, national or international, have little leverage in negotiating for the drugs that have few or no therapeutic options.
 - The framework is dated:
 - Further strengthen IP regime, higher prices and lower domestic R&D investment.
 - Inflated list prices and non-transparent rebates.
 - Specialty therapies increasingly dominating the drug landscape.
 - Medicines priced for value, a factor not currently in PMPRB toolbox.
 - A risk-based approach required for medicines with the most market power.
 - Premium priced comparator countries, including the US.
 - Challenge related to biosimilars: An investigation into the pricing of patented biosimilars will only be initiated if a complaint is filed.

- (b) List and describe the proposed changes to the Patented Medicines Regulations to protect Canadians from excessive prescription drug prices.

Commentary on Question:

Candidates had to list and briefly describe the proposed changes for full credit. A full description (similar to what is listed below) was not necessary for full credit. Partial credit was given where candidates only listed the proposed changes.

- Benchmarking prices against countries that are more like Canada economically and from a consumer price protection standpoint. The existing basket consists of 7 countries; it is proposed to include additional comparator countries and to drop 2 outliers.

2. Continued

- Regulating at the level of the actual prices being paid in Canada and not just the non-transparent manufacturer list prices.
 - As a result of significant discounts and rebates to third-party payers, actual prices paid in the market are significantly lower than list prices.
 - Without access to this information, the PMPRB is left to set its domestic price ceilings based on inflated prices.
 - Considering the value and the overall affordability of a medicine when setting the maximum price.
 - Consider value for money: a country should not pay for a drug more than the value it offers.
 - Consider the size of the market: a drug should not be priced at a level that may result in rationing by payers.
 - Consider GDP and GDP per capita: A medicine should not be priced at a level that patients and/or payer cannot afford.
- (c) Summarize the challenges faced by the federal government in implementing its national dental-care plan.

Commentary on Question:

Most candidates demonstrated a good understanding of the Canada Dental Benefit. For full credit, candidates needed to summarize the current federal government challenges and not only give a description of the proposed plan. Not all points listed below was required for full credit.

- Timing: beginning in 2022, children under age 12 will become eligible for benefits, meaning they are behind in timelines.
- Only 6.5 million people would benefit from the plan because of its stringent participation thresholds.
- Costs of the program could be higher than estimated.
- Complicated to establish a dedicated dental plan from scratch.
- Lack of universality creates an incentive for premium-paying families to opt out of existing dental insurance plans.
- Provinces, territories and employers that fund existing dental care plans could potentially discontinue their plans and refer patients to the federal dental-care plan.
- In a matter of months, the vast network of public and private dental care plans across Canada could be disrupted as patients are shuffled from one plan to another.
- A two-tiered oral health system could result in private sector dentists refusing to treat patients insured by the federal dental-care plan.

2. Continued

- Means testing for access to dental plan insured services may open the door to means testing for certain health-care insured services like cataract surgery and hip and knee replacements.
- (d) Calculate the required one-time cash payment that will allow the employee to remain on the biologic until retirement at no additional cost. State any assumptions and show your work.

Commentary on Question:

Candidates generally did well on this calculation portion of this question. For full credit, candidates need to show their work.

Information on employee

Age 60

Will retire at 65

Assumptions

Monthly cost of biologic	\$2,500
Annual increase of the biologic	7.00%
Monthly cost of biosimilar	\$1,875
Annual increase of the cost of biosimilar	6.00%
Annual interest rate	4.00%
Timing of prescription	One prescription per month, at the beginning of the month
Marginal tax rate	35.00%

2. Continued

Month	Sample calculation		Cost of biologic		Cost of biosimilar	
	(A)	(B)	(C) = (A)*(B)		(D)	(E) = (A)*(D)
	mid year discount @ 4%	Monthly Cost	PV of Monthly Cost		Monthly Cost	PV of Monthly Cost
1	1.0000	\$2,500	\$2,500	\$1,875	\$1,875	
2	0.9967	\$2,500	\$2,492	\$1,875	\$1,869	
3	0.9935	\$2,500	\$2,484	\$1,875	\$1,863	
4	0.9902	\$2,500	\$2,476	\$1,875	\$1,857	
5	0.9870	\$2,500	\$2,468	\$1,875	\$1,851	
6	0.9838	\$2,500	\$2,459	\$1,875	\$1,845	
7	0.9806	\$2,500	\$2,451	\$1,875	\$1,839	
8	0.9774	\$2,500	\$2,443	\$1,875	\$1,833	
9	0.9742	\$2,500	\$2,435	\$1,875	\$1,827	
10	0.9710	\$2,500	\$2,428	\$1,875	\$1,821	
11	0.9678	\$2,500	\$2,420	\$1,875	\$1,815	
12	0.9647	\$2,500	\$2,412	\$1,875	\$1,809	
13	0.9615	\$2,675	\$2,572	\$1,988	\$1,911	
14	0.9584	\$2,675	\$2,564	\$1,988	\$1,905	
15	0.9553	\$2,675	\$2,555	\$1,988	\$1,899	
Table continues from month 1-60, covering 5 years of drug benefits.						
58	0.8300	\$3,277	\$2,720	\$2,367	\$1,965	
59	0.8273	\$3,277	\$2,711	\$2,367	\$1,958	
60	0.8246	\$3,277	\$2,702	\$2,367	\$1,952	

Cost of biologic:	\$156,086	(F) = Sum Column (C)
Cost of biosimilar:	\$114,835	(G) = Sum Column (E)
One-time cash payment required	\$41,251	(H) = (F) - (G)
One-time cash payment required (pre-tax)	\$63,463	(H)/(1-0.35)

- (e) Calculate the minimum annual rebate you need to negotiate. State any assumptions and show your work.

Solution:

Information

Employer will pay 60%
 Rebate paid at end of year
 Rebates are equal

Assumptions

Monthly cost of biologic \$2,500
 Annual interest rate 4%
 Timing of rebate End of year

2. Continued

One-time cash payment from employer	\$24,751	$(I) = (H) * 60\%$
Necessary present value of rebate	\$16,500	$(J) = (H) - (I)$
Sum of 5 year of discount factors	4.451822	(K)
One-time cash payment required	\$3,706.35	$(J)/(K)$

End of year	discount factor @ 4%	Rebate (check)	PV of Rebate
1	0.96153846	\$3,706	\$3,564
2	0.92455621	\$3,706	\$3,427
3	0.88899636	\$3,706	\$3,295
4	0.85480419	\$3,706	\$3,168
5	0.82192711	\$3,706	<u>\$3,046</u>
	Total		\$16,500

- (f) Recommend whether Company ABC should implement either of the below changes. Justify your answers.
- (i) Participating in the insurer's biosimilar program
 - (ii) Eliminating the employer dental program

Commentary on Question:

Reasonable recommendations backed with justification were awarded full credit. For part (i), candidates needed to provide more justification than only saving money to be awarded full marks if they were recommending implementing the insurer's biosimilar program.

- (i) Recommendation: The company should implement the biosimilar program.

Justification: Since May 2019, public drug plans in four provinces have launched non-medical biosimilar switching policies, requiring patients to use biosimilars of approved indications. Such policies are widely discussed and expected to be introduced across Canada. It would make sense for the company to follow suit of provincial programs.

- (ii) Recommendation: The company should not remove their dental care program.

2. Continued

Justification: Only uninsured households earning less than \$90,000 per year would be entitled to benefits provided through the government program. It is likely that many of their employees have household incomes higher than this and would not qualify for the program, leaving them uninsured. In fact, the employee on the biologic earns \$100,000, so there is at least one employee who will be uninsured.

3. Learning Objectives:

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

Learning Outcomes:

- (4b) Determine appropriate baseline assumptions for benefits and population.
- (4c) 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.
- (4d) Describe funding alternatives for post-retirement and post-employment benefits.
- (4e) Describe current issues faced by governments, employers and employees related to post-retirement and post-employment benefits.

Sources:

CIA Educational Note – Health Care Trend Rate, May 2012, pp. 4-17 only

Morneau Shepell Handbook of Canadian Pension & Benefit Plans, 17th Edition, 2020

- Ch. 24: Post-retirement and Post-employment Benefits

GHVR-650-F23: Supplement Calculation Note for IAS 19

GHVR-667-16: Hicks Morley Pension and Benefits–2013 Case Law Update, pp. 62-70

GHVR-668-16: The New Reality of Retiree Benefits

GHVR-669-16: The End of Retiree Benefits?

Commentary on Question:

Most candidates did not exhibit full understanding of post-retirement benefit liability calculation. In particular, most candidates did not understand the interaction between mortality and withdrawal (multi-decrement) and recognize the decrement takes place mid-year.

Solution:

- (a) Calculate the following for Company ABC's retiree benefits plan:
 - (i) Defined Benefit Obligation (DBO) as at December 31, 20X1
 - (ii) Current service cost for 20X2

3. Continued

Commentary on Question:

- *Candidates needed to recognize the following key points:*
 - *Although claims costs are as at “age 65”, there is no aging assumed, so claims costs are simply in 20X1 dollar.*
 - *Timing of decrements is at “mid-year”, therefore calculation of present value of cashflow, mortality and withdrawal rates must also be recognized at “mid-year”.*
 - *Candidates must recognize the interaction between mortality and withdrawal in calculation of survival to mid-year and end of year.*
 - *Many candidates did not recognize the relationship between current years of services, years of services to retirement and length of attribution period, and the use of such to calculate Defined Benefit Obligations and Service Cost.*

In the solution below, Year 20X1 corresponds to year 2023, year 20X2 below corresponds to year 2024, and so on.

The first table below demonstrates the calculation of claims costs and discount factors. Note:

- (1) 2023/20X1 claims costs include insurer administrative fees and taxes*
- (2) Discount factors are calculated as at mid-year.*

The second table below demonstrates the calculation of discounted cashflow for an active employee.

The last table below demonstrates the calculation of discounted cashflow for a retiree. Note the starting age is 72 and cashflow ends at age 110 (end of mortality table).

3. Continued

Active/Retiree Age	Year	Drug Trend Rates	Dental Trend Rates	Drug Claim Costs	Dental Claim Costs	Total Claim Costs	Discount
	2023	7.0%	4.0%	2,376	594	2,970	
42/70	2024	6.8%	4.0%	2,542	618	3,160	0.976
43/71	2025	6.6%	4.0%	2,715	642	3,358	0.929
44/72	2026	6.4%	4.0%	2,894	668	3,563	0.885
45/73	2027	6.2%	4.0%	3,080	695	3,775	0.843
46/74	2028	6.0%	4.0%	3,271	723	3,993	0.803
58/86	2040	4.0%	4.0%	5,816	1,157	6,973	0.447
59/87	2041	4.0%	4.0%	6,049	1,203	7,252	0.426
60/88	2042	4.0%	4.0%	6,291	1,251	7,542	0.406
61/89	2043	4.0%	4.0%	6,543	1,302	7,844	0.386
80/108	2062	4.0%	4.0%	13,784	2,742	16,527	0.153
81/109	2063	4.0%	4.0%	14,336	2,852	17,188	0.146
82/110	2064	4.0%	4.0%	14,909	2,966	17,875	0.139
83/111	2065	4.0%	4.0%	15,506	3,085	18,590	0.132
108/136	2090	4.0%	4.0%	41,335	8,223	49,558	0.039
109/137	2091	4.0%	4.0%	42,989	8,552	51,540	0.037
110/138	2092	4.0%	4.0%	44,708	8,894	53,602	0.035

3. Continued

Active Employees						
Age	Year	Survival at beginning of year	Mortality	Withdrawal	Survival to mid-year	Survival to end of year
	2023					
42	2024	1.00000	0.00069	0.06000	0.96920	0.93935
43	2025	0.93935	0.00075	0.06000	0.91039	0.88233
44	2026	0.88233	0.00080	0.06000	0.85511	0.82872
45	2027	0.82872	0.00086	0.03000	0.81585	0.80317
46	2028	0.80317	0.00092	0.03000	0.79067	0.77836
58	2040	0.54681	0.00287	0.03000	0.53777	0.52888
59	2041	0.52888	0.00318	0.03000	0.52006	0.51139
60	2042	0.51139	0.00350	0.00000	0.51049	0.50960
61	2043	0.50960	0.00384	0.00000	0.50862	0.50764
80	2062	0.41548	0.02571	0.00000	0.41010	0.40480
81	2063	0.40480	0.02913	0.00000	0.39886	0.39300
82	2064	0.39300	0.03320	0.00000	0.38643	0.37996
83	2065	0.37996	0.03805	0.00000	0.37266	0.36550
108	2090	0.00072	0.47973	0.00000	0.00052	0.00037
109	2091	0.00037	0.50988	0.00000	0.00026	0.00018
110	2092	0.00018	1.00000	0.00000	0.00000	0.00000

3. Continued

Retired Employees						
Age	Year	Survival at beginning of year	Mortality	Withdrawal	Survival to mid-year	Survival to end of year
	2023					
70	2024	1.00000	0.00934	0.00000	0.99532	0.99066
71	2025	0.99066	0.01031	0.00000	0.98554	0.98045
72	2026	0.98045	0.01134	0.00000	0.97487	0.96933
73	2027	0.96933	0.01244	0.00000	0.96328	0.95727
74	2028	0.95727	0.01366	0.00000	0.95071	0.94419
86	2040	0.68644	0.05832	0.00000	0.66612	0.64641
87	2041	0.64641	0.06734	0.00000	0.62426	0.60288
88	2042	0.60288	0.07765	0.00000	0.57900	0.55607
89	2043	0.55607	0.08932	0.00000	0.53065	0.50640
108	2062	0.00148	0.47973	0.00000	0.00107	0.00077
109	2063	0.00077	0.50988	0.00000	0.00054	0.00038
110	2064	0.00038	1.00000	0.00000	0.00000	0.00000
111	2065	0.00000	0.00000	0.00000	0.00000	0.00000
136	2090	0.00000	0.00000	0.00000	0.00000	0.00000
137	2091	0.00000	0.00000	0.00000	0.00000	0.00000
138	2092	0.00000	0.00000	0.00000	0.00000	0.00000

Employee Group	Number of Employees	Age	Years of			Attribution (Current Yo5 / Yo5 at Retirement)	PV of Cashflow	DBO = PV of Cashflow x Attribution	Service Cost = PV of Cashflow / Attribution Period
			Current Years of Service (Yo5)	Years to Retirement	Service at Retirement (Attribution Period)				
Actives	120	42	8	23	31	25.8%	3,653,481	942,834	117,854
Retirees	30	70	-	-	-	-	1,813,622	1,813,622	-
Total	150						5,467,103	2,756,456	117,854

- (b) List the national and global factors that impact health care cost trend rates.

Commentary on Question:

Not all points below were required for full mark.

3. Continued

- Inflation (General vs. Medical vs. Substitution Effect)
 - Interaction of general inflation (price changes over the whole economy) with real health care inflation (rate of increase in the cost of health care goods), as medical inflation generally will follow general inflation plus a positive margin.
- Gross Domestic Product (GDP)
 - Government health care program financing may be limited by growth in GDP and proportion of GDP spent on health care.
- Changes in Utilization
- Technology/Medical Developments
 - Availability of new health products and/or services/treatments.
- Attitudes and Behaviours
 - Healthier lifestyles, increased use of preventative or screening regimens.
 - Changes in attitude of “entitlement” versus attitude of “only if medically necessary”.
 - Changing societal views regarding use of health care goods and services to defer death rather than dying with dignity and providing only convalescent care.
 - Changing behaviours and habits impacting individual health status.
- Government Policy
 - The way services are funded, e.g., by government or privately.
- Population Demographics
 - As the baby boomers retire, the demographic profile of the retiree population profile may change from prior years and affect historic claim trend rates.
 - New drug development and other health care goods and services to accommodate an aging population.
- Access to Health Care/Health Care Providers
 - Limited by wealth of nation, geographical location and/or seasonal climate changes.
 - Reduced wait times for surgical procedures, increased use of ambulatory care.

3. Continued

- National Education and Advertising of Health Care Issues
 - Increased education and advertising associated with health likely increases health care trend rates in the short term but may reduce trends in the longer term due to improvements in general health.

(c) Describe the considerations in developing:

- (i) Initial short-term health care cost trend rate assumptions
 - (ii) Long-term health care cost trend rate assumptions
 - (iii) Transition assumptions between the initial short-term and long-term health care cost trend rates
- (i) Initial short-term health care cost trend rate assumptions
- Recent Past Experience - based on recent claims experience when sufficient credible experience exists or other comparable plans.
 - Size of Group – important aspect for determining credibility/relevance of plan’s recent trends compared to other fully credible plans with similar plan design.
 - Plan Provisions – consideration should be given to type of benefits being projected and the plan provisions:
 - Provisions such as maximums, deductibles and copays/cost-sharing can result in trend rate increases that differ from gross trend rate increases over time.
 - Lifetime maximums aimed at or having the effect of shrinking the plan’s health care costs.
 - Annual or biannual limits on total benefits or a specific benefit such as vision care, especially if most members are likely to reach the annual limit each year.
 - Other plan features, such as deductibles and cost sharing, often combined with elective coverage, are more likely to impact the actual cost rate, rather than the initial short-term trend rate, unless there have been recent changes to such plan provisions.

3. Continued

- Anticipated Plan Changes - following changes may be anticipated when setting the health care trend rate based on the terms of engagement:
 - Management's recent or planned activities to reverse adverse trends.
 - Change in carrier (e.g., may reduce short-term costs while increasing short-term trends as both the plan sponsor and its carrier reduce their focus on cost containment in the years following the change in carrier).
 - Change in government programs (e.g., delisting of services from provincial plans).

- (ii) Long-term health care cost trend rate assumptions
 - The long-term health care cost trend rate is less of an actuarial assumption but a long-term economic assumption.
 - Higher short-term health care growth cannot be sustained over long term as it will erode the economy – as such, long-term health care trend rate must be in line with long-term economic growth.
 - Short-term trend rates expected to grade down and ultimately merge into the GDP growth rate.

- (iii) Transition assumption between the initial short-term and long-term health care cost trend rates
 - Usually, a simple straight-line approach is used to transition from the short-term to the long-term rates.
 - Grade-down period may vary by benefit type and depend on plan provisions.
 - Should consider sensitivity of trend rate assumptions on overall valuation results.
 - May depend on difference between the initial short-term trend rate and the long-term trend rate.
 - Consider research models and tools available to assist in reviewing the long-term trend rates – e.g. U.S. growth rates model developed by Professor Thomas Getzen of Temple University (sponsored by SOA) and Canadian growth rates model developed by McMaster University (sponsored by SOA/CIA).
 - Other models or tools can also be used to analyze the reasonableness of a proposed long-term health care trend rate.
 - Grade-down based on excess health growth over GDP reaching resistance and converging to zero.

3. Continued

- (d) Calculate the revised DBO as at December 31, 20X1 for the proposed retiree HCSA benefit. State any assumptions and show your work.

Commentary on Question:

Candidate must recognize HCSA annual allowance does not increase with trend. Candidate should also take into consideration that benefits period is limited to age 75.

Year	HCSA Trend Rates	HCSA Claims	Total Claim Cost	Discount	Active Employees					Retired Employees					Present Value of Cashflow				
					Survival at beginning of year	Mortality	Withdrawal	Survival to mid-year	Survival to end of year	Age	Survival at beginning of year	Mortality	Withdrawal	Survival to mid-year		Survival to end of year			
2023	0.0%	2,970	2,970																
2024	0.0%	2,970	2,970	0.976	42	1.000	0.001	0.060	0.969	0.939	70	1.000	0.009	0.000	0.995	0.991	2,884.86		
2025	0.0%	2,970	2,970	0.929	43	0.939	0.001	0.060	0.910	0.882	71	0.991	0.010	0.000	0.986	0.980	2,720.49		
2026	0.0%	2,970	2,970	0.885	44	0.882	0.001	0.060	0.855	0.829	72	0.980	0.011	0.000	0.975	0.969	2,562.89		
2027	0.0%	2,970	2,970	0.843	45	0.829	0.001	0.030	0.816	0.803	73	0.969	0.012	0.000	0.963	0.957	2,411.83		
2028	0.0%	2,970	2,970	0.803	46	0.803	0.001	0.030	0.791	0.778	74	0.957	0.014	0.000	0.951	0.944	2,267.00		
2029	0.0%	2,970	2,970	0.765	47	0.778	0.001	0.030	0.766	0.754	75	0.944	0.015	0.000	0.937	0.930			
2030	0.0%	2,970	2,970	0.728	48	0.754	0.001	0.030	0.742	0.731	76	0.930	0.017	0.000	0.922	0.915			
2031	0.0%	2,970	2,970	0.694	49	0.731	0.001	0.030	0.719	0.708	77	0.915	0.018	0.000	0.906	0.898			
2032	0.0%	2,970	2,970	0.661	50	0.708	0.001	0.030	0.697	0.686	78	0.898	0.020	0.000	0.889	0.880			
2033	0.0%	2,970	2,970	0.629	51	0.686	0.001	0.030	0.675	0.664	79	0.880	0.023	0.000	0.869	0.859			
2034	0.0%	2,970	2,970	0.599	52	0.664	0.002	0.030	0.654	0.643	80	0.859	0.026	0.000	0.848	0.837			
2035	0.0%	2,970	2,970	0.571	53	0.643	0.002	0.030	0.633	0.623	81	0.837	0.029	0.000	0.825	0.813			
2036	0.0%	2,970	2,970	0.543	54	0.623	0.002	0.030	0.613	0.603	82	0.813	0.033	0.000	0.799	0.786			
2037	0.0%	2,970	2,970	0.518	55	0.603	0.002	0.030	0.594	0.584	83	0.786	0.038	0.000	0.771	0.756			
2038	0.0%	2,970	2,970	0.493	56	0.584	0.002	0.030	0.575	0.565	84	0.756	0.044	0.000	0.739	0.723			
2039	0.0%	2,970	2,970	0.469	57	0.565	0.003	0.030	0.556	0.547	85	0.723	0.051	0.000	0.704	0.686			
2040	0.0%	2,970	2,970	0.447	58	0.547	0.003	0.030	0.538	0.529	86	0.686	0.058	0.000	0.666	0.646			
2041	0.0%	2,970	2,970	0.426	59	0.529	0.003	0.030	0.520	0.511	87	0.646	0.067	0.000	0.624	0.603			
2042	0.0%	2,970	2,970	0.406	60	0.511	0.004	0.000	0.510	0.510	88	0.603	0.078	0.000	0.579	0.556			
2043	0.0%	2,970	2,970	0.386	61	0.510	0.004	0.000	0.509	0.508	89	0.556	0.089	0.000	0.531	0.506			
2044	0.0%	2,970	2,970	0.368	62	0.508	0.004	0.000	0.507	0.506	90	0.506	0.102	0.000	0.480	0.455			
2045	0.0%	2,970	2,970	0.350	63	0.505	0.005	0.000	0.504	0.503	91	0.455	0.117	0.000	0.427	0.401			
2046	0.0%	2,970	2,970	0.334	64	0.503	0.005	0.000	0.502	0.501	92	0.401	0.133	0.000	0.374	0.348			
2047	0.0%	2,970	2,970	0.318	65	0.501	0.006	0.000	0.499	0.498	93	0.348	0.150	0.000	0.321	0.296			
2048	0.0%	2,970	2,970	0.303	66	0.498	0.006	0.000	0.496	0.495	94	0.296	0.168	0.000	0.270	0.246			
2049	0.0%	2,970	2,970	0.288	67	0.495	0.007	0.000	0.493	0.491	95	0.246	0.187	0.000	0.222	0.200			
2050	0.0%	2,970	2,970	0.274	68	0.491	0.008	0.000	0.489	0.488	96	0.200	0.206	0.000	0.179	0.159			
2051	0.0%	2,970	2,970	0.261	69	0.488	0.008	0.000	0.485	0.483	97	0.159	0.227	0.000	0.140	0.123			
2052	0.0%	2,970	2,970	0.249	70	0.483	0.009	0.000	0.481	0.479	98	0.123	0.247	0.000	0.107	0.093			
2053	0.0%	2,970	2,970	0.237	71	0.479	0.010	0.000	0.476	0.474	99	0.093	0.269	0.000	0.079	0.068			
2054	0.0%	2,970	2,970	0.226	72	0.474	0.011	0.000	0.471	0.469	100	0.068	0.291	0.000	0.057	0.048			
2055	0.0%	2,970	2,970	0.215	73	0.469	0.012	0.000	0.466	0.463	101	0.048	0.315	0.000	0.040	0.033			
2056	0.0%	2,970	2,970	0.205	74	0.463	0.014	0.000	0.460	0.456	102	0.033	0.340	0.000	0.027	0.022			

Employee Group	Number of Employees	Age	Current Years of Service (YoS)	Years to Retirement	Years of Service at Retirement (Attribution Period)	Attribution (Current YoS / YoS at Retirement)	PV of Cashflow	DBO = PV of Cashflow x Attribution	Service Cost = PV of Cashflow / Attribution Period
Actives	120	42	8	23	31	25.8%	443,897	114,554	14,319
Retirees	30	70 -	-	-	-	-	385,412	385,412	0.00
Total							829,309	499,966	14,319

- (e)
- (i) Recommend next steps for company ABC to respond to the grievance. Justify your answer.
 - (ii) Recommend plan changes company ABC could consider to address the union concerns. Justify your answer.

3. Continued

Commentary on Question:

The following are sample answers only – other reasonable recommendations were also rewarded.

For question (ii) – Alternative plan design changes (such as coinsurance level, deductible, etc.) or different approach that company ABC could take to implement the changes were considered reasonable answers.

- (i) Recommend next steps for company ABC to respond to the grievance. Justify your answer.
- Recommend company ABC to review Collective Bargaining Agreement to ensure union’s acknowledgment that benefits of the retirees are subject to change in all circumstances of the case, as well as union’s ability to agree to changes.
 - Recommend company ABC to set up a meeting with union to discuss the plan design changes and the grievance.
 - Recommend company ABC to seek legal advice and support.
- (ii) Recommend plan changes company ABC could consider to address the union concerns. Justify your answer.
- Company ABC could consider alternative plan design to phase-in the impact. Some plan design alternatives are:
 - Limit the duration of retiree benefits (for example up to age 75).
 - Premium sharing with retirees.
 - Reduce coverage level such as coinsurance, annual maximums, increase deductible, etc.
 - Company ABC could take a different approach to implement plan design changes:
 - Seek legal advice and meet with the union before implementing any changes.
 - Change wording in Collective Bargaining Agreement and benefit booklets to ensure company ABC “reserve the right to change, reduce or eliminate retiree benefits”.
 - Current retirees and employees close to retirement with long service are likely vested and cannot change benefits. Therefore, should focus on changes to the benefit plan for future retirees (i.e., new hires, younger employees and employees with low service).
 - Provide enough time to make changes – any changes will take time since expectations with employees will need clear communication.

4. Learning Objectives:

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

Learning Outcomes:

- (3a) Describe the regulatory and policy making process in Canada.
- (3c) Understand the impact of the taxation of both insurance companies and the products they provide.
- (5a) Describe eligibility requirements for social programs in Canada and the benefits provided.
- (5b) Describe how private group insurance plans work within framework of social programs in Canada.

Sources:

GHVR-621-19: CLHIA: Guideline G3, Group Life and Health Insurance

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

Sustainability of the Canadian Health Care System and Impact of the 2014 Revision to the Canada Health Transfer, Sep 2013, Executive Summary and Ch. 11 only

Morneau Shepell Handbook of Canadian Pension Benefit Plans, 17th Edition, 2020 - Ch. Ch. 2: Government Pension Programs

Commentary on Question:

Candidates were expected to understand the regulatory and policy making process in Canada, including how the Canada Health Transfer payments are determined. Candidates were also expected to be able to critique recommendations with consideration to the impacts towards group and federal benefit programs and their internal mechanics. Most candidates showed an understanding towards CPP disability benefits and group disability insurance but were generally unable to describe the mechanics of the Canada Health Transfer payments and their 2014 changes.

Solution:

- (a)
 - (i) Critique the CFO's assertion concerning the CPP disability benefit.
 - (ii) Describe how the disabled employee's group benefits would be impacted if the plan were to terminate.

4. Continued

Commentary on Question:

Most candidates were able to critique the CFO's comments and understood how the CFO's requested changes impact group benefits coverage for current employees.

- (i) CPP disability benefits are only available to the contributor if they meet certain conditions:
 - The contributor must have a severe and permanent disability.
 - The contributor is unable to engage in any substantially gainful occupations with earnings in excess of \$5,800 per year (in 2020).
 - The contributor must meet the contribution requirements (i.e. contributed to the CPP for a certain period in their contributory periods to be eligible for a disability pension.
 - While the CPP disability benefit is available, the CPP disability monthly benefit is capped at a maximum for each year (\$1,536.67 in 2023). This provides a much lower replacement ratio than the current benefits design (66.67% up to \$5,000 of monthly salary).
- (ii) Every contract of Group Insurance with a Life Waiver of Premium provision should provide that, upon termination of the contract or benefit provision, the insurance on the life of a Plan Member who is disabled according to the definition of disability included in the contract of Group Insurance at the time of the termination will be continued as though the contract or benefit provision were in full force and effect. Similarly, every contract of Group Insurance with a Disability Income Benefit should provide that, upon termination of the contract or benefit provision, the Disability Income Benefit of a Plan Member who is disabled according to the definition of disability included in the contract of Group Insurance at the time of its termination will be continued as though the contract or benefit provision were in full force and effect. This assumes that the LTD benefit is insured.
- (b) With respect to the CFO's concerns over government offloading of costs, you review the 2014 revisions to the Canada Health Transfer (CHT) payment calculations.
 - (i) List and describe how the federal government supports provinces and territories with the funding of health care expenditures.
 - (ii) Describe the 2014 revisions to CHT payment calculations and what their expected impacts were.
 - (iii) List approaches available to governments to safeguard the sustainability of Canada's health care system.

4. Continued

Commentary on Question:

Most candidates were unable to describe how the federal government supports provinces and territories with health care funding. Few candidates were able to describe the 2014 CHT revisions.

- (i) The federal government supports provinces and territories with the funding of health care expenditures using the Canada Health Transfer (CHT). Currently, it includes both tax points and cash transfers.

CHT tax points are a result of the federal government decreasing its income tax rates in the late 1970s, allowing the provinces/territories to use the additional tax space. The tax points that are appropriated to the CHT are impacted by the evolution of the tax base (personal and corporate income) and were expected to grow in line with the economy.

In 2004/05 and 2005/06, total CHT cash transfers were set at fixed amounts in accordance with the prescription of the Federal-Provincial Fiscal Arrangement Acts. They are increasing at a nominal annual rate of 6% until 2013/14.

Total CHT cash transfers are allocated to each province/territory so that each province/territory receiving a total CHT entitlement (cash transfer plus tax points) is proportional to its population (i.e. equal to per capita total CHT)

Using the current CHT calculation formula, the federal cash transfers associated with the CHT will be funding 22.9%, on average, of total health care expenditures of provinces/territories in 2037.

- (ii) CHT cash transfers will be allocated differently by province/territory. They are currently allocated on the basis of equal-per-capita total CHT entitlement (including tax points and cash transfers). Starting with fiscal year 2014-2015, they will be allocated on the basis of equal-per-capita CHT cash transfers. Aggregate CHT cash transfers will be increasing at an annual rate equal to a three-year moving average of the GDP growth. There is a further guarantee that total cash transfers will increase by at least 3 percent every year.

With these proposed changes, the CHT cash transfer would grow less than using the current calculation formula.

4. Continued

These changes will have different impacts for different provinces. Some will end up with a higher reduction in their total available revenues (PEI, NS, QC, BC), some will end up with a slightly less pronounced reduction (ON) and some can expect nearly no change to their cumulative CHT cash transfer over the projection period (AB).

The calculation formula will have a significant effect on the ability of provinces/territories to continue supporting the health care system. Provinces/territories will have to find new sources of funding to make up the difference.

- (iii) Research shows that in order to safeguard the sustainability of its healthcare system, Canada has to:
- Significantly limit health care cost increase.
 - Boost GDP growth.
 - Raise taxes/fees.
 - Substantially reduce or cut other government programs or services.
 - Implement some combination of the above.

(c) Calculate the following:

- (i) The budgeted group benefits plan costs for 20X2.
- (ii) The raise in employee salaries that the result in (i) would fund.

State any assumptions and show your work.

Commentary on Question:

Nearly all candidates were able to calculate total costs per employee, except for application of premium tax and retail sales tax. Some candidates forgot to exclude certain benefits for the employee on disability.

4. Continued

(i)

Employee profile	Basic Life Insurance	Calculation
Active_1	\$1,104.60	
Active_2	\$946.80	Volume x rate / 1000 x headcount x 12
Active_3	\$820.56	
Active_4	\$568.08	
Active_5	\$946.80	
Long Term Disabled_1	\$0.00	

Employee profile	Short Term Disability	Calculation
Active_1	\$1,999.04	
Active_2	\$1,713.46	Volume x rate / 10 x headcount x 12
Active_3	\$1,485.00	
Active_4	\$792.00	
Active_5	\$792.00	
Long Term Disabled_1	\$0.00	

Employee profile	Long Term Disability	Calculation
Active_1	\$4,162.38	
Active_2	\$3,567.75	Volume x rate / 100 x headcount x 12
Active_3	\$3,092.05	
Active_4	\$2,130.00	
Active_5	\$2,130.00	
Long Term Disabled_1	\$0.00	

Employee profile	Extended Health Care	Dental	Calculation
Active_1	\$7,200.00	\$5,160.00	
Active_2	\$4,320.00	\$3,096.00	rate x headcount x 12
Active_3	\$2,880.00	\$2,064.00	
Active_4	\$1,440.00	\$1,032.00	
Active_5	\$1,440.00	\$1,032.00	
Long Term Disabled_1	\$1,440.00	\$1,032.00	

Employee profile	Salary (20X1)	Health Care Spending Account (HCSA)	Calculation
Active_1	\$35,000	\$1,673.75	headcount x HSA amount x utilization x (1+admin exp)
Active_2	\$50,000	\$1,004.25	
Active_3	\$65,000	\$669.50	
Active_4	\$90,000	\$334.75	
Active_5	\$150,000	\$334.75	
Long Term Disabled_1	\$75,000 (pre-disability)	\$334.75	

	Basic Life Insurance	Short Term Disability	Long Term Disability	Extended Health Care	Dental	Health Care Spending Account
Annual Premium	\$4,386.84	\$6,781.50	\$15,082.18	\$18,720.00	\$13,416.00	\$4,351.75
Premium Tax	included	included	included	included	included	\$87.04
Retail sales tax	\$350.95	\$542.52	\$1,206.57	\$1,497.60	\$1,073.28	\$348.14

Total Cost in 20X1	\$67,844.36
Budgeted for 20X2	\$78,021.02

--> based on a 15% budgeted increase

(ii)

Salary Increase Percentage: **10.6%** --> use goal seek
 Total increase to payroll: **\$73,564.26**

Employee	Salary	Headcount	Salary	Additional costs (per EE)					Total	Grand Total
				Salary	EI	CPP	EHT	Total		
Active_1	\$35,000	5	\$38,705	\$3,705	\$85	\$220	\$72	\$4,082	\$20,409	
Active_2	\$50,000	3	\$55,292	\$5,292	\$121	\$315	\$103	\$5,831	\$17,494	
Active_3	\$65,000	2	\$71,880	\$6,880	\$0	\$95	\$134	\$7,109	\$14,219	
Active_4	\$90,000	1	\$99,526	\$9,526	\$0	\$0	\$186	\$9,712	\$9,712	
Active_5	\$150,000	1	\$165,877	\$15,877	\$0	\$0	\$310	\$16,187	\$16,187	
									\$78,021	

(d) Recommend whether ABC Company should eliminate its group benefits plan in exchange for higher employee salaries. Justify your response.

Commentary on Question:

Candidates were generally able to provide recommendations on why ABC should not eliminate its groups benefits program. However, if a candidate was unable to answer part (c), many times, they did not attempt part (d), even though there are points available that are not dependent on (c).

I recommend keeping the benefits program because:

- Benefits are tax preferred while salaries attract income and payroll taxes.
- Some employees may have benefit requirements/needs that are beyond the magnitude of a raise.
- Some employees may be better off dollar-wise, but may lose their safety net, especially if they do not have access to a secondary plan (such as a spousal plan).
- Instead of eliminating benefits all together, ABC may consider reducing coverage or requiring additional employee contributions.

5. Learning Objectives:

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

Learning Outcomes:

- (2a) Interpret insurer financial statements from the viewpoint of various stakeholders.
- (2c) Project financial outcomes and recommend strategy to senior management to achieve financial goals.
- (2d) Describe the planning process of a life and health insurance company (strategic, operational, and budgeting).
- (2g) Explain fair value accounting principles and describe International Accounting Standards (IAS).
- (2h) Construct basic financial statements and associated actuarial entries for a life and health insurance company.

Sources:

GHVR-712-F23: IFRS 17 Expenses

IFRS 17 Insurance contract examples

CIA educational note – financial condition testing, Jan 2023, pp. 1-45

Commentary on Question:

Overall, candidates did not perform well on this question. Most candidates were able to classify expenses and identify key elements of financial condition testing, but very few were able to create a statement of profit/loss.

Solution:

- (a) Describe the two interpretations of directly attributable expenses.

Commentary on Question:

Most students were able to identify one part of the answer in the model solution, but did not provide enough information to earn full credit.

- One potential view is that an expense would only be considered directly attributable if it is incurred for the clear purpose of either issuing insurance contracts or fulfilling obligations under insurance contracts. From this perspective, expenses such as investment management, asset liability management and risk management would *not* be considered directly attributable.

5. Continued

- While these expenses are incurred to support the profitable operation of an insurance entity, the primary purpose of these functions is one or two steps removed from acquiring insurance contracts or fulfilling obligations under insurance contracts.
- The counter argument to the view above is that an insurance entity could not plausibly fulfil its obligations under its insurance contracts without expenses such as investment management, asset liability management, and risk management.
- Furthermore, 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(l). From this perspective, a wider interpretation of the scope of “directly attributable” could potentially be adopted.

(b) Calculate the following:

- (i) Directly attributable expenses
- (ii) Non-directly attributable expenses

State any assumptions and show your work.

Commentary on Question:

Candidates performed either very well or not on this part of the question. An area where most candidates left marks on the table was consistently classifying grey area expenses.

5. Continued

Expense Items	Expenses Incurral Time	(\$000s)	Expense Category	
Claim handling	Recur annually	3	Directly attributable	Maintenance
Company holiday party	Recur annually	4	Non-Directly Attributable	Maintenance
Insurance company tax filing	Recur annually	3	Non-Directly Attributable	Maintenance
Recruitment of employees working for the product	Incur prior to Issuance	2.5	Directly attributable	Acquisition
Investment management	Recur annually	17	GREY	Maintenance
Marketing	Incur prior to Issuance	10	GREY	Acquisition
Policy issuance and renewal	Incur prior to Issuance	5	Directly attributable	Acquisition
Pricing	Incur prior to Issuance	16.5	Directly attributable	Acquisition
CEO salary	Recur annually	8	Non-Directly Attributable	Maintenance
Services of external risk management consultants	Recur annually	15	GREY	Maintenance
Statutory reporting	Recur annually	12	GREY	Maintenance
Medical underwriting	Incur at Inception	12	Directly attributable	Acquisition
Other directly attributable expenses	Incur prior to Issuance	45	Directly attributable	Acquisition
Other non-directly attributable Expenses	Incur at Inception	30	Non-Directly Attributable	Acquisition
		Total	Acquisition	Maintenance
	Directly attributable	84	81	3
	Non-Directly Attributable	45	30	15
	GREY	54	10	44
	Scenario 1 - Grey Area items grouping to attributable			
	Attributable	138	91	47
	Non attributable	45	30	15
	Scenario 2 - Grey area items grouped to non-attributable			
	Attributable	84	81	3
	Non attributable	99	40	59
	Other scenarios are acceptable: Grey area items can be either classified as attributable or non attributable			

- (c) Create the projected statement of profit or loss that covers the duration of the product. State any assumptions and show your work.

Commentary on Question:

Candidates did not perform well on this part of the question. Partial marks were given to candidates who made an attempt or calculated part of the statement of profit/loss correctly.

Solution:

SCENARIO 1 - Investment + Mkt + RM + Reporting exp are directly attributable		SCENARIO 1 - Investment + Mkt + RM + Reporting exp are directly attributable				
			Year 1	Year 2	Year 3	Year 4
Insurance Premiums (paid upfront)	1,500	Insurance Revenue				
Insurance claims (per year)	200	Expected claims and other expenses	247.00	247.00	247.00	247.00
Directly attributable acquisition expenses (Incurred at or prior to initial recognition)	91	CSM recognized for service provided	105.25	105.25	105.25	105.25
Directly attributable maintenance expenses (per year)	47	Amortization of insurance acquisition cash flow	22.75	22.75	22.75	22.75
Non-directly attributable acquisition expenses	30	Total Insurance Revenue	375.00	375.00	375.00	375.00
Non directly attributable maintenance expenses (per year)	15					
Calculation of CSM:		Insurance Service Expenses				
Total Premium	1,500.00	Incurred Claims and other expenses	247.00	247.00	247.00	247.00
Claims	-800.00	Amortization of insurance acquisition cash flow	22.75	22.75	22.75	22.75
Directly attributable acquisition expenses	-91.00	Total Insurance Service Expenses	269.75	269.75	269.75	269.75
Directly attributable maintenance expenses	-188.00					
Total CSM	421.00	Insurance Service Result	105.25	105.25	105.25	105.25
CSM Per Year	105.25	Other Expenses	45.00	15.00	15.00	15.00
		Profit	60.25	90.25	90.25	90.25

- (d) Describe the primary factors affecting directly attributable expense projections.

5. Continued

Commentary on Question:

Some candidates were able to identify expected policy growth strategy as a primary factor affecting directly attributable expense projections, but many candidates did not provide information to earn full marks on this question.

- The entity's expected overall expense growth: expense growth would be influenced by general inflation and by the entity's cost management strategy. It may be reasonable to assume that the entity's fixed cost base would increase over time at the expected rate of general inflation, unless the entity has a credible cost containment (or expansion) strategy.
 - The entity's expected policy growth strategy: a growing aggregate policy base over time could result in lower fixed expense allocations to the group, as the entity's fixed costs would be spread over a broader base of contracts. Variable costs would grow proportionally to the growth in the policy base, perhaps adjusted for general inflation.
 - In a growing entity, it may be possible that unit cost allocations would decrease over time if the entity's policy growth exceeds its fixed expense growth. Conversely, in an entity that is not growing (runoff of inforce exceeds new business), unit cost allocations would likely increase at a faster rate than the entity's expense growth. For these reasons, reasonable new business and inforce run off projections, and an understanding of the fixed/variable nature of the entity's expenses, are likely to be fundamental inputs into the projection of expenses in the FCF.
- (e) Create the projected statement of profit or loss in accordance with the instructions provided by the chief actuary. State any assumptions and show your work.

Commentary on Question:

Candidates did not perform well on this part of the question. Partial marks were given to candidates who made an attempt or calculated part of the statement of profit/loss correctly.

SCENARIO 2 - Investment + Mkt + RM + Reporting exp are NOT directly attributable		SCENARIO 2 - Investment + Mkt + RM + Reporting exp are NOT directly attributable				
			Year 1	Year 2	Year 3	Year 4
Insurance Premiums (paid upfront)	1,500					
Insurance claims (per year)	200	Insurance Revenue				
Directly attributable acquisition expenses (Incurred at or prior to initial recognitio	81	Expected claims and other expenses	203.00	203.00	203.00	203.00
Directly attributable maintenance expenses (per year)	3	CSM recognized for service provided	151.75	151.75	151.75	151.75
Non-directly attributable acquisition expenses	40	Amortization of insurance acquisition cash flow	20.25	20.25	20.25	20.25
Non directly attributable maintenance expenses (per year)	59	Total Insurance Revenue	375.00	375.00	375.00	375.00
Calculation of CSM:		Insurance Service Expenses				
Total Premium	1,500.00	Incurred Claims and other expenses	203.00	203.00	203.00	203.00
Claims	-800.00	Amortization of insurance acquisition cash flow	20.25	20.25	20.25	20.25
Directly attributable acquisition expenses	-81.00	Total Insurance Service Expenses	223.25	223.25	223.25	223.25
Directly attributable maintenance expenses	-12.00	Insurance Service Result	151.75	151.75	151.75	151.75
Total CSM	607.00	Other Expenses	99.00	99.00	60.00	59.00
CSM Per Year	151.75	Profit	52.75	92.75	91.75	92.75

5. Continued

- (f)
- (i) Recommend which interpretation of directly attributable expenses you should use based on your calculations in part (c) and (e). Justify your answer.
 - (ii) Recommend actions that should be taken in implementing the interpretation in (i). Justify your answer.

Commentary on Question:

Since candidates have experienced difficulties in parts c) and e) there were generally also unable to make a recommendation in part i). Some candidates were able to make a recommendation in part ii) that earned part marks, but generally candidates were not able to provide enough information to receive full marks.

- (i) Scenario where Investment management expenses, Marketing, Services of an external risk management consultant and Statutory reporting expenses are considered not directly attributable should be recommended since it provides better Insurance Services Results associated with this new 4-years term product, while overall results will be the same under both interpretations.

Indeed, expected directly attributable acquisition and maintenance expenses are both included in the fulfilment cash flows (FCF) at initial recognition, and therefore impact the amount of the contractual service margin (CSM) or loss component. As a result, the more expenses that are included in the FCF at initial recognition, the lower the CSM will be for the group; furthermore, the probability increases for contracts in the group to be classified as onerous.

- (ii) This interpretation may or may not align with the view of some audit firms, so each entity is advised to consult with its auditor before finalizing the entity's own views.

The Appointed Actuary Report (AAR) disclosure would also include qualitative comments on whether the grey area expense items discussed in Section 4 of this report (and other company specific grey areas that are material) are considered as directly attributable expenses or not.

Moreover, actuaries would be expected to outline the rationale for categorizing these expenses as directly or non-directly attributable expenses.

5. Continued

- (g)
- (i) Identify the key elements of Financial Condition Testing (FCT).
 - (ii) Propose corrective management actions in response to this scenario. Justify your answer.

Commentary on Question:

Candidates performed well on this part of the question.

- (i)
 - Development of a base scenario.
 - Development of adverse scenarios.
 - Identification and analysis of the effectiveness of corrective management actions to mitigate risks.
 - A report on the results of the analysis and recommendations to the insurer's management and the board of directors or chief agent.
 - An opinion signed by the Appointed Actuary (AA) indicating the financial condition of the insurer.

- (ii)
 - Morbidity risk:
 - Increasing premium rate - Cannot increase premiums already paid up-front, but can increase premiums for future clients.
 - More active claims management.

 - Inflation risk:
 - Implementing rate increases, where possible.
 - Reviewing the extent of the coverage and cost containment features.
 - Reviewing the asset mix to increase real rates of return.
 - Reviewing policies, procedures, and staffing to control costs.

 - Expense risk:
 - Practice strict management of budgets to meet expense levels included in pricing.

6. Learning Objectives:

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

Learning Outcomes:

- (3b) Describe the major applicable laws and regulations and evaluate their impact.
- (3c) Understand the impact of the taxation of both insurance companies and the products they provide.

Sources:

GHVR-621-19: Canadian Life and Health Insurance Association: Guideline G3, Group Life and Health Insurance

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

GHVR-671-16: CHLIA Guideline G4 – Coordination of Benefits

Commentary on Question:

Candidates generally did well on this question.

Solution:

- (a) List the elements that a booklet should contain according to Guideline G3 from the CLHIA.

Commentary on Question:

This was a retrieval question where candidates had to list up to 12 elements included in the Guideline G3 from the CLHIA. Candidates did not have to list all the elements of the solution to get full marks.

- the name of the insurer and identification of the contract
- the name of the Group Policyholder, and may include the division, subsidiary or affiliate of the Group Policyholder
- the amount, or the method of determining the amount, of insurance on the Plan Member and on any other persons insured under the contract of Group Insurance through the Plan Member
- a description of any exclusions or limitations
- a clarification that the document is intended to summarize some of the contract provisions. In the event of a difference of wording from those of the contract, the contract will prevail, to the extent permitted by law
- the circumstances in which the insurance terminates and the rights, if any, upon such termination, of the Plan Member and of any other person insured under the contract through the Plan Member

6. Continued

- in a prominent position, words to the effect that the insurance information contained in the document is important and the document should be kept in a safe place
 - the procedure to be followed by a claimant in making a claim including:
 - to whom and where claims should be made
 - the time limit within which a claim must be made or within which a notice or proof of claim must be submitted
 - information about obtaining the form required for submission of a claim
 - where and from whom the Plan Member may obtain more detailed information about the benefit or other provisions under the contract of Group Insurance which are relevant to the Plan Member.
- (b) List the advantages and disadvantages of a self-insured LTD plan.

Commentary on Question:

This question was well answered as most candidates were able to get full marks. Candidates understood the advantages, disadvantages and risks related to self-insuring LTD.

Advantages:

- 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.

Disadvantages:

- 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.

6. Continued

(c)

- (i) Identify whether or not each of the group benefits are taxable for Alberta employees by completing the table below.

Benefit	Are premiums paid or contributions made by the employer taxable income for the employee?		Are benefits received by the employee taxable income for the employee?	
	Federal level	Provincial level	Federal level	Provincial level
Basic life				
Accidental Death and Dismemberment (AD&D) insurance				
LTD insurance				
Health and dental benefits				

- (ii) Identify changes to the table in (i), if any, for employees residing in Quebec.

Commentary on Question:

This part of the question was well answered by most of the candidates.

(i)

Benefit	Are premiums paid or contributions made by the employer taxable income for the employee?		Are benefits received by the employee taxable income for the employee?	
	Federal level	Provincial level	Federal level	Provincial level
Basic life	Yes	Yes	No	No
Accidental Death and Dismemberment (AD&D) insurance	Yes	Yes	No	No
LTD insurance	No	No	Yes (because the employer contributed to the plan)	Yes (because the employer contributed to the plan)
Health and dental benefits	No	No	No	No

6. Continued

- (ii) Only Health and Dental benefits will have a change in taxable status in the hands of Quebec employees.
- Premiums paid by the employer are not taxable for federal income tax purposes. However, they are taxable for Quebec provincial income tax purposes.
 - There is no change to the taxable status for the benefits received by the employee because the health and dental benefits are insured plan.
- (d) You are given the following information:

Provisions	Great Product's plan	Spouse's group plan
Deductible	\$0	\$100
Coinsurance	75%	80%
Annual paid maximum	\$750	\$1,500

- The CHRO's first claim is for \$1,000

Calculate the total amount paid by each plan. State any assumptions and show your work.

Commentary on Question:

The majority of candidates got full marks on this question.

- Great Product's plan is the first payer as John is an employee of Great Product and the group plan where John is a spouse is the second payer.
- As an employee of Great Product = $\text{Min}(75\% \times \$1,000; \$750) = \$750$
- As a spouse under his spouse's plan = $\text{Min}(\$1,000 - \$750; \text{Min}(80\% \times (\$1,000 - \$100); \$1,500)) = \$250$
- Total = $\$750 + \$250 = \$1,000$

7. Learning Objectives:

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

Learning Outcomes:

- (2b) Evaluate key financial performance measures used by life and health insurers for both short and long-term products.
- (2c) Project financial outcomes and recommend strategy to senior management to achieve financial goals.

Sources:

GHVR-693-23: OFSI Guidelines for Life Insurance Capital Adequacy Test (LICAT)

- Chapter 1: Overview and General Requirements (All sections) (pp. 5-14)
- Chapter 2: Available Capital (sections 2.1-2.2) (pp. 15-40)
- Chapter 6: Insurance Risk: (sections 6.1-6.8, excluding 6.7) (pp. 125-143)

Commentary on Question:

Candidates were asked to understand the various insurance risk components related to insurance. Candidates were generally able to list and describe the components, however they were unable to provide the details by risk. Candidates were also asked to be able to calculate the DTA amounts.

7. Continued

Solution:

(i)

$\text{Total Ratio} = \frac{\text{Available Capital} + \text{Surplus Allowance} + \text{Eligible Deposits}}{\text{Base Solvency Buffer}}$
$\text{Core Ratio} = \frac{\text{Tier 1 Capital} + 70\% \text{ Surplus Allowance} + 70\% \text{ Eligible Deposits}}{\text{Base Solvency Buffer}}$
<p><u>Available capital</u>: available Capital comprises Tier 1 and Tier 2 capital, and involves certain deductions, limits and restrictions.</p>
<p><u>Surplus Allowance</u> is equal to the net risk adjustment (i.e. the risk adjustment net of all reinsurance) reported in the financial statements in respect of all insurance contracts other than risk adjustments arising from segregated fund contracts with guarantee risks. The risk adjustment refers to the risk adjustment for non-financial risks reported in the financial statements.</p>
<p><u>Eligible deposit</u>: collateral and letters of credit placed by unregistered reinsurers and claims fluctuation reserves may be recognized as Eligible Deposits subject to criteria for risk transfers</p>
<p><u>Base Solvency Buffer</u>:</p> <ul style="list-style-type: none">• Aggregate capital requirement is calculated by regions. (Canada, US, UK, Europe, Japan and other)• Consist of 5 risk components (credit risk, market risk, insurance risk, segregated fund guarantee risk, operational risk)• Aggregate requirements are reduced by credits for participating and adjustable products, risk diversification.• Multiplier to aggregate requirement = 1

(ii)

- OSFI has established a Supervisory Target Total Ratio of 100% and a Supervisory Target Core Ratio of 70%.
- Insurers are required, at minimum, to maintain a Total Ratio of 90% and a Core Ratio of 55%.

(b)

- (i) List and describe the insurance risk components required for the bundled plan.
- (ii) Describe the steps to calculate each component in (i), including shock factors.

7. Continued

Commentary on Question:

Most candidates were able to list the various insurance risk components. However additional details on how to calculate each component, including shock factors in order to get full marks.

Mortality risk: required for term life business. This is the risk associated with the incidence of death. It includes components of level, trend, volatility, and catastrophe risk.

$$RC_{mortality} = \sqrt{RC_{vol}^2 + RC_{cat}^2} + RC_{level} + RC_{trend}$$

Steps

1. Determine if the business is life supported or death supported. Apply -15% shock to mortality rate and +75% shock to Mortality improvement rate, discounted at 5.3%.
 - Death supported if PV of shocked CF > PV of BE CF
 - Life supported if PV of shocked CF < PV of BE CF
2. Calculate Level Risk
 - Life supported business: (1+Factor) x BE Mortality. Factor is 11% + 20% volatility component / net expected claim (of the following year), capped at 25%
 - Death supported: 15% decrease in BE Mortality
3. Calculate Trend risk
 - Life supported: -75% to MI assumption for 25 years and no mortality improvement after 25 years
 - Death supported: +75% permanent MI assumption shock
4. Volatility risk: $RC = 2.7 \times A \times (1-V/F)$
 - A: standard deviation of upcoming years projected death claims
 - V: total BE liability net of registered reinsurance
 - F: total face amount net of registered reinsurance
5. Catastrophe risk: shock 1.0 number of deaths per thousand life

Morbidity risk: required for LTC. This is the risk associated with the incidence of health claim and from termination rate.

$$RC_{morbidity} = \sqrt{RC_{vol}^2 + RC_{cat}^2} + RC_{level} + RC_{trend}$$

7. Continued

Steps

1. As the business is individually underwritten, individual business shocks apply.
2. Calculate Level Risk
 - Active life: +30% of LTC incidence rate assumption
 - Disabled LTC: -25% shock to LTC termination rate assumption
3. Calculate Trend risk
 - Permanent 100% decrease in BE for morbidity improvement; or use 0% morbidity improvement assumption
4. Volatility risk: shock first year incidence rate by +30%
5. Catastrophe risk: shock first year incidence rate by +10%

Lapse risk: As the business is individually underwritten, lapse shocks are applied.

$$RC_{lapse} = \sqrt{RC_{vol}^2 + RC_{cat}^2} + RC_{level+trend}$$

Steps

1. Level and trend risk: +/-30% shock applied dynamically.
 - At durations where net cash surrender values are higher than Best Estimate Liabilities, lapse rates are shocked upwards, and at all other durations they are shocked downwards.
2. Volatility risk: +/-30% shock applied in the first year
3. Catastrophe risk:
 - For lapse sensitive products, an absolute increase of 20 percentage points in the Best Estimate Assumption for lapse for the first year only.
 - For lapse supported products, a 40% proportional reduction of the Best Estimate Assumption for lapse in the first year only.

Expense risk: The combined shock is an increase of 20% in the first year followed by a permanent increase of 10% in all subsequent policy years. Expense shocks are applied to maintenance expenses. Premium taxes and investment income tax are excluded.

- (c) Calculate the DTA Temporary amount included in available capital. State any assumptions and show your work.

Commentary on Question:

Generally, candidates were able to recall the formula for the calculation. However, in order to get full marks, they were required to be able to apply the calculation to the provided example.

7. Continued

Gross Tier 1 Assets	(a)	4 500 000
All deductions from Gross Tier 1 except those relating to Deferred Tax Assets (DTA)	(b)	2 402 000
DTA arising from temporary differences	(c)	300 000
DTA other than those arising from temporary differences	(d)	100 000
Deferred Tax Liability (DTL) associated with goodwill	(e)	50 000
Other DTL	(f)	120 000

Calculate DTA net of eligible DTL

DTL Allocated to DTA Temp = $(f) \times (c) / ((c) + (d)) = 120\,000 \times 300\,000 / (300\,000 + 100\,000)$	90 000
DTL Allocated to DTA nonTemp = $(f) \times (d) / ((c) + (d)) = 120\,000 \times 100\,000 / (300\,000 + 100\,000)$	30 000
DTA Non-Temp net of eligible DTL = $(d) - \text{DTL Allocated to DTA nonTemp}$	70 000
DTA Temp net of DTL = $(c) - \text{DTL Allocated to DTA Temp}$	210 000

Calculate DTA Temp deducted from Gross Tier 1

T1 deduction = $(b) + \text{Deduction of DTA Non-Temp}$	2 472 000
DTA Temp deducted from Gross Tier 1 = $\text{Max}[\text{DTA Temp net of DTL} - 10\% \times (\text{T1Gross} - \text{T1Deductions}); 0] / 0.9$	8 000

DTA Temp included in Available Capital is limited to 10% of Net Tier 1

Net T1 = $(a) - (b) - \text{Deduction of DTA Non-Temp} - \text{Deduction of DTA Temporary}$	2 020 000
DTA Temp included in T1 = $(c) - \text{DTL Allocated to DTA Temp} - \text{Deduction of DTA Temporary}$	202 000
DTA Temp included in T1 = 10% of Net Tier 1(Validated)	202 000