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# CURATED PAST EXAM ITEMS

## - Questions -

### GH 201-C – Valuation and Regulation, Canada

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#### **Important Information:**

- These curated past exam items are intended to allow candidates to focus on past SOA fellowship assessments. These items are organized by topic and learning objective with relevant learning outcomes, source materials, and candidate commentary identified. We have included items that are relevant in the new course structure, and where feasible we have made updates to questions to make them relevant.
- Where an item applies to multiple learning objectives, it has been placed under each applicable learning objective.
- Candidate solutions other than those presented in this material, if appropriate for the context, could receive full marks. For interpretation items, solutions presented in these documents are not necessarily the only valid solutions.
- Learning Outcome Statements and supporting syllabus materials may have changed since each exam was administered. New assessment items are developed from the current Learning Outcome Statements and syllabus materials. The inclusion in these curated past exam questions of material that is no longer current does not bring such material into scope for current assessments.
- Thus, while we have made our best effort and conducted multiple reviews, alignment with the current system or choice of classification may not be perfect. Candidates with questions or ideas for improvement may reach out to [education@soa.org](mailto:education@soa.org). We expect to make updates annually.



# **Exam GH 201-C**

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# **Exam GH 201-C**

# **Learning Objective 1**

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## **GH FVA Fall 2020 #1.**

(6 points) You are a consulting actuary specializing in calculating claim reserves for comprehensive medical benefit plans.

- (a) (2 points) Describe considerations for establishing claim reserves for short-term benefits.

ANSWER:

- (b) (1 point) Describe ways you can check the reasonability of your claim reserve calculation.

ANSWER:

A client expressed interest in increasing its medical plan's deductible from \$100 to \$2,000.

- (c) (1 point) Explain the effects this change could have on your client's year-end claim reserves.

ANSWER:

Another client inquired about the use of stochastic reserve methods.

- (d) (2 points)
- (i) List and describe four stochastic modeling techniques.
  - (ii) List considerations for applying stochastic modeling to estimating reserves.

ANSWER:

### GH FVA Fall 2020 #3.

(5 points) You are a valuation actuary for Ridge Run Consulting and have been asked to calculate the year-end reserves for your clients using the development method.

- (a) (2 points) Describe characteristics of coverage for which the development method is appropriate.

ANSWER:

Skyline Health, Canyon Health, and Stagecoach Health are three insurance companies offering various types of healthcare coverage. Each company has provided claim patterns for their most recent twelve months of incurred claims.

**Skyline Health  
Paid Claims by Incurred Month (000's)  
Month Incurred**

Lag	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
0	\$2,000	\$3,200	\$3,300	\$3,100	\$2,600	\$3,000	\$2,300	\$2,700	\$3,400	\$2,800	\$2,300	\$1,800
1	\$510	\$30	\$1,810	\$1,520	\$110	\$1,000	\$660	\$1,630	\$1,440	\$130	\$1,980	
2	\$1,280	\$650	\$20	\$1,820	\$1,470	\$630	\$1,890	\$120	\$1,230	\$160		
3	\$990	\$450	\$850	\$1,940	\$1,500	\$1,500	\$1,720	\$1,180	\$290			
4	\$290	\$1,480	\$1,680	\$1,260	\$50	\$1,520	\$820	\$980				
5	\$710	\$430	\$170	\$10	\$160	\$1,010	\$70					
6	\$170	\$50	\$110	\$360	\$250	\$360						
7	\$1,770	\$920	\$420	\$1,800	\$1,080							
8	\$190	\$440	\$300	\$30								
9	\$110	\$420	\$440									
10	\$170	\$210										
11	-											

**Canyon Health  
Paid Claims by Incurred Month (000's)  
Month Incurred**

Lag	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
0	\$2,000	\$3,200	\$3,300	\$3,100	\$2,600	\$3,000	\$2,300	\$2,700	\$3,400	\$2,800	\$2,300	\$1,800
1	\$1,450	\$900	\$950	\$650	\$1,100	\$900	\$1,150	\$1,000	\$800	\$1,300	\$1,000	
2	\$550	\$900	\$950	\$900	\$850	\$800	\$900	\$950	\$850	\$900		
3	\$350	\$450	\$400	\$450	\$400	\$400	\$450	\$400	\$450			
4	\$70	\$60	\$80	\$40	\$40	\$60	\$60	\$70				
5	\$40	\$50	\$30	\$30	\$40	\$40	\$40					
6	\$20	\$20	\$20	\$30	\$30	\$20						
7	\$20	\$10	\$30	\$10	\$10							
8	\$10	\$20	\$10	\$10								
9	\$20	\$20	\$10									
10	\$5	\$3										
11	-											

### 3. Continued

**Stagecoach Health**  
**Paid Claims by Incurred Month (000's)**  
**Month Incurred**

Lag	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
0	\$2,000	\$3,200	\$3,300	\$3,100	\$2,600	\$3,000	\$2,300	\$2,700	\$3,400	\$2,800	\$2,300	\$1,800
1	\$1,860	\$2,980	\$3,070	\$2,880	\$2,420	\$2,790	\$2,140	\$2,510	\$3,160	\$2,600	\$2,140	
2	\$1,730	\$2,770	\$2,860	\$2,680	\$2,250	\$2,590	\$1,990	\$2,330	\$2,940	\$2,420		
3	\$1,610	\$2,580	\$2,660	\$2,490	\$2,090	\$2,410	\$1,850	\$2,170	\$2,730			
4	\$1,500	\$2,400	\$2,470	\$2,320	\$1,940	\$2,240	\$1,720	\$2,020				
5	\$1,400	\$2,230	\$2,300	\$2,160	\$1,800	\$2,080	\$1,600					
6	\$1,300	\$2,070	\$2,140	\$2,010	\$1,670	\$1,930						
7	\$1,210	\$1,930	\$1,990	\$1,870	\$1,550							
8	\$1,130	\$1,790	\$1,850	\$1,740								
9	\$1,050	\$1,660	\$1,720									
10	\$980	\$1,540										
11	\$910											

- (b) (2 points) Recommend whether or not the development method is appropriate for each company. Justify your answer.

ANSWER:

### 3. Continued

Comet Health is another health insurance company that has provided its paid claims pattern for claims incurred in January as well as the total paid claims for incurred months January through December. It was determined that the development method is appropriate to use.

Lag	January Incurred Claims
0	\$2,000
1	\$2,900
2	\$1,100
3	\$700
4	\$130
5	\$70
6	\$40
7	\$30
8	\$20
9	\$30
10	\$5
11	-
Total	\$7,025

Incurred Month	Total Paid Claims
January	\$7,025
February	\$8,026
March	\$8,220
April	\$7,320
May	\$7,510
June	\$7,430
July	\$7,480
August	\$7,530
September	\$7,600
October	\$7,200
November	\$4,300
December	\$1,800

(c) (1 point)

- (i) Calculate the completion factor for each lag using January's completion pattern. Show your work.
- (ii) Calculate the total year-end reserve using the completion factors developed in part (i). Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## GH FVA Spring 2021 #2.

(4 points) You are the reserving actuary for Northern Insurance Company, a small Canadian insurance company offering long-term disability (LTD) group insurance.

(a) ~~(2 points) Describe challenges you may face in the valuation of Northern Insurance Company's group and health business.~~

ANSWER:

Employer A has an experience rating refund (ERR) provision in its contract. The future experience of Employer A through the end of its rate guarantee period is projected as follows:

- Premium: \$1,000,000
- Expense Premium: \$300,000
- Profit Charges: \$10,000
- Policyholder Liabilities on New Claims: \$600,000
- Interest Credited: \$10,000
- Interest Required on Existing Policyholder Liabilities: \$15,000
- Policyholder Margin on Existing Claim Liabilities: \$3,000
- Policyholder Margin on New Claim Liabilities: \$6,000
- Policyholder Valuation Expense: \$10,000
- Claims Administration Charges: \$20,000
- Discount Rate: 0%

(b) (1 point) Calculate the future ERR liability for Employer A. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 2. Continued

Employer B has been a policyholder for several years. You are given the following information on Employer B's claim reserve development during 2020. Amounts are in thousands of dollars.

<b>Claim Duration</b>	<b>Reserve at 1 Jan 2020</b>	<b>Actual Claim Payments</b>	<b>Valuation Interest Amount</b>	<b>Reserve at 31 Dec 2020</b>
5+	300	50	10.0	260
4	140	25	4.6	130
3	180	20	6.4	160
2	230	50	7.2	190
1	300	65	9.4	240

- (c) (1 point) Evaluate the adequacy of the claim reserves:
- (i) For each individual claim duration.
  - (ii) For the lifetime of the policy..

Show your work and justify your answer.

*The response for this part is to be provided in the Excel spreadsheet.*

## GH FVA Spring 2021 #5.

(5 points) You are an actuarial associate in the Group Life valuation area.

You have been provided the following historical paid claims data. Based on past experience, all claims are paid within 5 months of incurral.

Incurral Year	Months Between Incurral and Payment					Total Paid Claims
	0	1	2	3	4	
	Number of Claims Paid					
2018	792	396	264	132	72	\$175,000,000
2019	912	455	302	154	84	\$210,000,000

You also received the following information splitting recent 2020 claims activity by incurral and paid month.

Incurral Month	Number of Claims by Paid Month			Total Paid Claims Through 12/31/2020
	Oct 2020	Nov 2020	Dec 2020	
Oct 2020	38	23	12	\$8,900,000
Nov 2020		46	23	\$8,400,000
Dec 2020			38	\$4,600,000

Based on recent internal studies, the average annual mortality rate increase is 4% and the average annual wage increase is 3%. Group life benefit amounts are typically in proportion to wages.

- (a) (2 point) Recommend completion factors for use in reserving. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (b) (1 point) Calculate the number of incurred but not paid (IBNP) claims and the IBNP dollar amount for incurral months Oct 2020 to Dec 2020 using the completion factor method. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 5. Continued

Your boss mentions that there are some unusual patterns in the claims data.

- (c) (2 points) Propose questions to investigate based on your analysis of the patterns in the claims data. Justify your answer.

ANSWER:
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## GH FVA Fall 2021 #2.

(9 points)

- (d) (2 points) List factors the actuary should consider when projecting claims for a Premium Deficiency Reserve (“PDR”) calculation.

ANSWER:

Woodford Insurance Company (“Woodford”) sells individual Medicare Supplement policies, and the business has experienced significant losses in the last two years. The PDR for Woodford’s Medicare Supplement business is \$0 for this year end.

- (e) (1 point) Describe two reasons why a PDR of \$0 may be appropriate for Woodford’s Medicare Supplement business.

ANSWER:

Bayshore Insurance Company (“Bayshore”) insures a five-year group medical contract for which scheduled premium increases were expected to be sufficient to maintain profitability at issue for all five years. Results in the first year were consistent with expectations but now during its second year, Bayshore has updated its claims projections as shown in the following table:

Year	Annual Results (\$000)			
	Earned Premiums	Original Claims	Revised Claims	Expenses/ Commissions
1 (actual)	432	360	360	52
2 (expected)	443	371	378	53
3 (expected)	454	382	396	54
4 (expected)	464	392	414	56
5 (expected)	475	403	417	57

- (f) (1 point) Calculate the PDR at the end of year 2 for the group medical contract given the premium rate increases are guaranteed through year 5 and assume a discount rate of 0%. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 2. Continued

Denmain Insurance Group (“Denmain”) acquires this group medical contract from Bayshore during year 2 and intends to terminate it at the end of year 5. You are given the following about Denmain’s testing groups for its other lines of business:

Testing Group	Income Statement Original Actual Results for Year 2 (\$000)			
	Earned Premium	Incurred Claims	Expenses/ Commissions	Underwriting Gain/Loss
Group Disability	\$714	\$649	\$78	-\$13
Group Long-Term Care	\$741	\$631	\$86	\$24
Group Dental	\$300	\$255	\$35	\$10
Individual Major Medical	\$472	\$425	\$80	-\$33
Individual Medicare Supplement	\$47	\$52	\$3	-\$8
Totals	\$2,274	\$2,012	\$282	-\$20

Testing Group	Projected Underwriting Cash Flows by Year (\$000)				
	3	4	5	6	7
Group Disability	-\$14	\$3	\$4	\$5	\$7
Group Long-Term Care	\$19	\$22	\$21	\$23	\$25
Group Dental	\$13	\$10	\$9	\$6	\$5
Individual Major Medical	-\$22	\$0	\$5	Termed	Termed
Individual Medicare Supplement	-\$9	-\$7	-\$5	-\$4	\$0

- (g) (1 point) Calculate the PDR at each testing level for the Denmain businesses including the business acquired from Bayshore. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (h) (1 point) Recommend a grouping for the PDR at the reporting level for Denmain including the business acquired from Bayshore. Justify your answer.

ANSWER:

## 2. Continued

- (i) (1 point) Calculate the PDR at the reporting level for Denmain including the business acquired from Bayshore using your recommended grouping from (e). Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (j) (1 point) Recommend a method to allocate the PDRs from (f) by product for internal reporting purposes. Justify your answer.

ANSWER:

- (k) (1 point) Calculate the PDR at the reporting level for each product using the method recommended in part (g). Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

### GH FVA Fall 2021 #3.

(8 points) You are an actuary on the reserving team at Crisium Insurance. You are provided with the following for the small group and individual medical blocks of business:

Inpatient authorization data (see Excel).

Percentage of authorization data missing:

Incurred Month	1	2	3	4	5	6	7	8	9	10	11	12
Missing Data %	3%	3%	3%	3%	3%	3%	3%	3%	3%	5%	10%	15%

Claims paid and incurred to date (\$000s):

Incurred Month	1	2	3	4	5	6	7	8	9	10	11	12
Medical/Surgical	\$909	\$1,093	\$1,165	\$1,137	\$1,099	\$975	\$1,110	\$1,164	\$935	\$897	\$781	\$774

Cost per day estimates from lag analyses:

Incurred Month	1	2	3	4	5	6	7	8	9	10	11	12
Medical/Surgical	\$930	\$1,012	\$1,068	\$1,083	\$1,042	\$1,026	\$939	\$1,081	\$969	\$1,153	\$1,046	\$942

Assumed credibility of lag analyses:

Incurred Month	1	2	3	4	5	6	7	8	9	10	11	12
Medical/Surgical	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	90%	80%

Average contracted cost/day for inpatient claims is \$1,100 for months 1-10.

Months 1-10 contracted cost/day has a seasonality factor of 1.0.

Month 11 contracted cost/day has a seasonality factor of 1.05.

Month 12 contracted cost/day has a seasonality factor of 0.95.

- (a) (5 points) Calculate the total estimated inpatient Incurred But Not Reported (IBNR) reserve as of the end of the year. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (b) (1 point) Describe issues with using authorization reports when estimating an IBNR reserve.

ANSWER:

**3. Continued**

- (c) (2 points) Explain four different ways to add conservatism when using authorized days to estimate your IBNR reserve in (a). Justify your answer.

ANSWER:

**Question 5 pertains to the Case Study**

<https://www.soa.org/4ae4c3/globalassets/assets/files/edu/2021/fall/exams/fall-2021-exam-ghfva-case-study.pdf>

**GH FVA Fall 2021 #5.**

(8 points) You are a senior actuary for Skyfall and have been asked to do reserve work for the Quantum Legacy III – Individual product.

You are given the following:

- For months that are estimated to be 70% or more complete:
  - Use the age to ultimate method.
  - Utilize September Year 3 incurred data for the age to ultimate factors.
- For months that are estimated to be less than 70% complete:
  - Utilize a PMPM or projection method.
  - Utilize the corresponding month of the prior year for the PMPM or projection method.
  - Use a 7% annual trend assumption for the PMPM method.

- (a) (4 points) Calculate the incurred but not reported (IBNR) reserve as of September 30, Year 4. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

The Chief Actuary wants you to perform a run-out study of the reserves calculated as of September 30, Year 4, utilizing the data paid through December 31, Year 4.

- (b) (3 points) Calculate the difference between the original reserve and the revised reserve from the run-out study. Show your work

*The response for this part is to be provided in the Excel spreadsheet.*

- (c) (1 point) List considerations of Actuarial Standard of Practice #5 that can be used in estimating incurred claims.

ANSWER:

## GH FVC Spring 2022 #1.

(8 points) You are the consulting valuation actuary for Randolph Health Insurance (RHI).

- (a) ~~(1 point) Describe the considerations regarding the quality of data to be used for reserving according to Actuarial Standard of Practice No. 23.~~

ANSWER:

- (b) (1 point) Describe the considerations when setting initial lag factors for the age-to-age development method.

ANSWER:

In the Excel file, you are provided with RHI's cumulative paid claims by incurred month from January 2019 through December 2021 and member count for each month.

The CEO has asked you to provide an IBNR estimate as of 12/31/2021 with the following information and assumptions:

- Use the smoothed age-to-age factors by applying the averaging technique using the most recent six months of claims data and assuming all claims complete after 12 months
- Use the projection method to replace the incurred claim estimates for months where the completion factors are less than 30%
- Trend rate is 10% per annum.
- Use the January 2019-December 2020 experience period to develop the PMPMs.

- (c) (6 points) Calculate the IBNR estimate as of 12/31/2021. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## GH FVC Spring 2022 #2.

(8 points)

- (a) (3 points) You are an actuarial manager at a Long Term Disability (LTD) insurer. You receive the following email from your direct report.

*Hi, I was asked to help calculate the pending reserve for one of our members, age 40. We were informed of the claim one month after the end of the three-month elimination period. This member has a \$1000 monthly benefit payable for six months. I used our normal assumptions (interest rate at 4%, pending factor of 60%) and came up with a pending reserve of \$2747.27. Can you help review this to make sure I'm coming up with the correct answer?*

- (i) Critique the accuracy of your direct report's calculated pending reserve using your own estimate from the continuance table provided. Show your work.

<b>Claim Duration (months)</b>	<b>Age 40 at Claim</b>
0	1000
1	960
2	920
3	880
4	845
5	815
6	790
7	765
8	745
9	725
10	0

*The response for this part is to be provided in the Excel spreadsheet.*

**2. Continued**

You receive a follow-up email from your direct report.

*Hi, it turns out I had it backwards on when we were informed of the claim. Rather than one month after the end of the elimination period, it's supposed to be one month before the end of the elimination period. Sorry about that!*

- (ii) Evaluate how the pending reserves may change based on the follow-up email.

ANSWER:

Your direct report has put together the table below listing considerations for each of short and long term reserves.

Consideration	Long Term Reserves	Short Term Reserves
1. Seasonality	X	
2. Internal staff practices		X
3. Economic conditions	X	
4. Claim Expenses	X	
5. Reserve cells	X	
6. Policy provisions	X	X
7. Data integrity		X
8. Insurance characteristics	X	

- (b) (4 points)

- (i) (2 points) Describe each consideration listed in the table above.

ANSWER:

- (ii) (2 points) Critique the accuracy of each row in the table above.

ANSWER:

## 2. Continued

(e) — ~~(1 point) List and describe considerations of short term and long term reserves not identified above.~~

ANSWER:

### **GH FVC Spring 2022 #3.**

(7 points) You are the valuation actuary for a Canadian insurer specializing in Group health and disability.

- (a) ~~(2 points) Describe challenges facing actuaries valuing Group health and disability business.~~

ANSWER:

- (b) ~~(1 point)~~

- (i) ~~Define the Canadian Asset Liability Method (CALM).~~

ANSWER:

- (ii) ~~Explain the link between CALM policy liabilities and the accounting value of the supporting assets.~~

ANSWER:

- (c) (1 point) List factors to consider for setting termination rate assumptions for Group Long Term Disability (LTD).

ANSWER:

### 3. Continued

You are given the following information on your block of Group LTD policies:

Claim duration	Reserve at 2021-01-01	Actual 2021 payments	Reserve at 2021-12-31
11	281,000	48,000	241,000
10	71,000	13,000	62,000
9	79,000	15,000	67,000
8	83,000	16,000	73,000
7	94,000	19,000	80,000
6	113,000	18,000	99,000
5	120,000	16,000	102,000
4	135,000	18,000	117,000
3	169,000	23,000	146,000
2	218,000	38,000	172,000
1	285,000	60,000	219,000
Current year	n/a	23,000	400,000

- The valuation interest rate is 2%
- Payments occur at the midpoint of the year.

(d) (2 points) Calculate the gain/loss by duration and in total. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

(e) (1 point) Assess the adequacy of the reserve as of 2021-12-31. Justify your answer.

ANSWER:



## GH FVC Spring 2022 #4.

(7 points) You are the lead reserving actuary at Family Insurance Company (FIC), a small health insurance company whose primary market is selling Affordable Care Act (ACA)-compliant insurance.

Recently, a new type of head lice has emerged which causes more severe reactions due to secondary infections. Most kids infected need to be treated with antibiotics, while a few have also required hospitalization. Unfortunately, there is no treatment to stop the spread of these lice, and schools across the country have switched to remote learning. As a result, many parents have also been required to switch to working from home.

- (a) (1 point) Describe three different ways to incorporate conservatism into Incurred But Not Reported (IBNR) estimates.

ANSWER:

- ~~(b) (1 point) Recommend which method from (a) FIC should use for the ACA business. Justify your answer.~~

~~ANSWER:~~

Your team has compiled the following information about the ACA business.

	Year 1	Year 2	Year 3
Premium PMPM	\$598	\$600	\$626
Claims PMPM	\$481	\$540	\$513
Marketing Expense PMPM	\$55	\$50	\$52
Claims Department Expense PMPM	\$15	\$25	\$26
FIC's Salaries	\$47,640,000	\$60,150,000	\$67,080,000
Discount Rate	0%	0%	0%
Number of Members	198,500	200,500	215,000

- (c) (1 point) Calculate the Premium Deficiency Reserve (PDR) that should be recorded at 12/31/Year 2. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

#### 4. Continued

FIC also has a small block of Accident business which pays the policyholder a fixed amount if they are impacted by a covered accident.

(d) — (2 points) Recommend any conservatism FIC needs to include in each of the following reserves for the Accident business because of the lice outbreak. Justify your answer.

(i) — IBNR

ANSWER:

(ii) — Contract Reserves

ANSWER:

(e) — (2 points) Compare and contrast how this outbreak affects the reserves held for the ACA and Accident blocks of business.

ANSWER:

*The Excel spreadsheet has  
additional data and information applicable to this question.*

## **GH FVC Fall 2022 #4.**

*(9 points)*

- (a) *(2 points)* Describe considerations associated with establishing reserves for short-term benefits.

ANSWER:

You are an actuary at Creative Actuarial Consulting Company (CACC) and have been provided the dental claims data from your largest US client BigCo. A review of the data has not yet been performed.

In the Excel spreadsheet, you are provided with BigCo paid claims by incurred month from January 2020 through March 2021, along with membership and earned premium for each month. You notice a gap in data as a result of dental offices being closed from March 15, 2020 through June 15, 2020 due to the Covid-19 lockdown.

- (b) *(1 point)* Describe considerations for setting reserves for BigCo on March 31, 2021.

ANSWER:

- (c) *(2 points)* Calculate the IBNR reserve as of March 31, 2021 using the age-to-ultimate development method. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (d) *(1 point)* Evaluate the reasonableness of the reserve from (c) using membership and premium data. Show your work and justify your answer.

*The response for this part is to be provided in the Excel spreadsheet.*

#### 4. Continued

BigCo requests a memorandum outlining your findings, including any limitations. CACC uses the following table to assess compliance with ASOP 23.

<b>Analysis of Issues and Recommended Practices</b>	<b>Level of Compliance</b>	<b>Recommendation for Improvement</b>
Selection of Data		
Review of Data		
Use of Data		
Reliance on Data Supplied by Others		
Reliance on Other Information Relevant to the Use of Data		
Confidentiality		

~~(e) — (3 points)~~

~~(i) — (2 points) Assess the level of compliance for each listed consideration. Justify your answer.~~

**ANSWER:**

~~(ii) — (1 point) Recommend improvements to BigCo for each deficient consideration.~~

**ANSWER:**

*The Excel spreadsheet has  
additional data and information applicable to this question.*

## **GH VRC Spring 2023 #1.**

(12 points) Canadian insurance company XYZ has offered group life and long-term disability (LTD) coverages for decades. In January 20X1, the company started to offer accidental death and dismemberment (AD&D), short term disability (STD), and supplemental health coverage to their existing clients.

As an actuarial analyst, you are asked to prepare reserve calculations for all lines of business.

- (b) (2 points) List and describe the types of claim reserves and claim liabilities required in regulatory statements.

ANSWER:

- (c) (3 points)

- (i) List and describe basic techniques to estimate claim reserves.

ANSWER:

- (ii) Recommend reserve methods for each of XYZ's products. Justify your answer.

ANSWER:

In the Excel spreadsheet, you are provided with the historical supplemental health paid claims since the coverage became effective in January 20X1.

- (d) (4 points) Calculate the total incurred health claims from January 20X2 to June 20X2 using an average of the most recent six months' age-to-age factors. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (e) (1 point) Critique the use of the development method in part (c).

ANSWER:

## 1. Continued

- (f) (2 points) Calculate the Incurred But Not Paid (IBNP) reserve as of June 30, 20X2 by applying both credibility weights and an alternative method. State your assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## GH VRC Spring 2023 #4.

(11 points) You are the appointed actuary at XYZ insurance company. Recently, XYZ acquired a closed block of individual long-term disability (LTD) business from ABC insurance company (ABC). The closed block is composed entirely of disabled individuals.

- (a) (1 point) Identify the types of liabilities that XYZ would need to hold for the acquired block from ABC. Justify your response.

ANSWER:
---------

You are provided with the following sample policyholder data as a model representative point for the acquired block of ABC:

	Sample Policyholder A
Status	Disabled
Valuation date	December 31, 2022
Date of birth	December 31, 1967
Date of disability	June 30, 2016
Elimination Period	6 months
Benefit termination age	65
Annual benefit payment after Elimination Period	\$30,000, paid annually on December 31
Cost of Living Adjustment (COLA)	2%, applied annually at the beginning of each calendar year
Contractual Service Margin (CSM) balance as at the valuation date	\$25,000

	Valuation assumptions
Locked-in discount rate	4.0% per annum
Asset earned rate	4.5% per annum
CSM accretion rate	3.0% per annum

### 2022 Claims Termination Rate Study

Claims Duration	Year 1	Year 2	Year 3	Year 4+
Expected Termination (per 1,000 lives)	500	150	75	200
Actual Terminations (per 1,000 lives)	350	200	100	150

#### 4. Continued

- ~~(b) (1 point) Calculate a best estimate tabular claim reserve for Policyholder A as of the valuation date. State any assumptions and show your work.~~

~~The response for this part is to be provided in the Excel spreadsheet.~~

As IFRS 17 became effective for the period beginning on January 1<sup>st</sup>, 2023, XYZ is exploring the different IFRS 17 approaches for the recognition of future revenues on the acquired block of business.

- (c) Learning Objective 2  
(2 points) Compare and contrast the following approaches for revenue recognition under IFRS 17:

- (i) Liability for Incurred Claims (LIC) approach

ANSWER:

- (ii) Liability for Remaining Coverage (LRC) approach

ANSWER:

- (d) Learning Objective 2  
(4 points) Construct the CSM amortization schedule as of the valuation date under the following approaches, using Policyholder A as a representative point for the acquired block of business:

- (i) LIC approach

The response for this part is to be provided in the Excel spreadsheet.

- (ii) LRC approach

The response for this part is to be provided in the Excel spreadsheet.

State any assumptions and show your work.

- (e) Learning Objective 2  
(1 point) Recommend an approach for XYZ for revenue recognition of the acquired block of business. Justify your answer.

ANSWER:

#### 4. Continued

~~You have concerns over the recent claims termination experience at ABC insurance company.~~

- ~~(f) — (1 point) Critique the 2022 claims termination rate study based on actual-to-expected (A/E) ratios. State any assumptions and show your work.~~

~~*The response for this part is to be provided in the Excel spreadsheet.*~~

- ~~(g) — (1 point) Propose questions that XYZ should ask to ABC in order to get a deeper understanding of their 2022 experience study results.~~

~~ANSWER:~~

*The Excel spreadsheet has  
additional data and information applicable to this question.*

## **GH VRC Fall 2023 #1.**

(10 points) You are the valuation actuary for ABC Insurance Company.

(a) (2 points)

(i) Describe the Tabular method, Examiner's method, and Factor method.

ANSWER:

(ii) Explain for which lines of business it is appropriate to use each method.

ANSWER:

In the Excel spreadsheet, Exhibit 1 provides paid claims by incurred month for four scenarios.

(b) (3 points) Recommend whether the development method is appropriate for each scenario. Justify your answer.

*The response for this part is to be provided in the Excel spreadsheet.*

Guidance from your chief actuary is that there must be a minimum of 10 months of claim payments when using the development method.

In the Excel spreadsheet, Exhibit 2 provides paid claims by incurred month with large paid claims removed.

(c) (1 point) 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.

*The response for this part is to be provided in the Excel spreadsheet.*

(d) (2 points) Calculate the IBNR as of January 31, 20X2 using your recommendation from (c). Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 1. Continued

In the Excel spreadsheet, Exhibit 3 provides new information regarding reported unpaid large claims. Assume all large claims have been reported and the discharge date for all members is December 31, 20X2.

The Medical Director of ABC Health Insurance Company has reviewed the medical conditions for each member in the hospital and provided you the following information:

Hospital	Contract Terms
A	60% Percent of Charges
B	40% Percent of Charges
C	\$4,000 Average Cost Per Day
D	\$2,500 Average Cost Per Day

Additionally, there is a financial arrangement that caps insurer liability at \$300,000 per member per year.

- (e) (2 points) Calculate the total case reserve for the members in Exhibit 3. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## GH VRC Spring 2024 #1.

(10 points) You work for a company that added small group commercial health business six months ago, and you are responsible for coming up with the hospital claims reserve. You have three years of detailed hospital claim information for large group commercial health business in the same market. You only have total admits and paid hospital claims by month for the small group business.

(a) (3 points)

- (i) Describe four ways you could set a monthly Incurred But Not Reported (IBNR) reserve estimate for small group hospital claims, including the data needed to use each approach.

ANSWER:

- (ii) Propose a ranking of the four methodologies listed in part (a) (i), with #1 being the best and #4 being the worst in terms of methodologies to use when setting the small group IBNR reserve for hospital claims. Justify your answer.

ANSWER:

In the Excel spreadsheet, you are provided information on the hospital claims as well as your intern's IBNR reserve estimate of \$29,330,000 as of 6/30/20X2.

(b) (3 points)

- (i) Critique the intern's IBNR reserve estimate.
- (ii) Recommend the hospital IBNR reserve that you would record at 6/30/20X2. Justify your answer and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 1. Continued

In the Excel spreadsheet, Exhibits 1 and 2 provide enrollment and a history of paid claims by month for a block of small group dental business that has been declining in enrollment over the last few years. Assume claims are fully complete by 18 months from incurred date.

- (c) (3 points) Calculate the unpaid claim liabilities as of 8/1/20X2 using a development method that addresses the enrollment decline for the following completion ratios. Show your work.
- (i) 3-month average completion ratios
  - (ii) 6-month average completion ratios
  - (iii) 9-month average completion ratios

*The response for this part is to be provided in the Excel spreadsheet.*

- (d) (1 point) Recommend which completion ratios to use in your final estimate. Justify your answer.

ANSWER:

*The Excel spreadsheet has  
additional data and information applicable to this question*

## **GH VRC Fall 2024 #1.**

(8 points) You are a valuation actuary for Enchancia Managed Care (EMC).

(a) (1 point) Define the following terms:

- (iii) Valuation date
- (iv) Incurral date
- (v) Reporting date
- (vi) Reporting lag
- (vii) Payment lag

ANSWER:

EMC previously only sold large group major medical policies but has expanded its offerings to include small group major medical policies beginning January 20X2.

You are given the following methodology to calculate IBNR for the small group block:

- Use the loss ratio method for the two most recent incurred months.
- Use the development method for payment for all other incurred months.
- Factors should be based on the arithmetic average of the large group development factors from claims incurred in calendar 20X1.
- The small group pricing loss ratio is 80%.
- The large group pricing loss ratio is 85%.

In the Excel spreadsheet, you are provided claim and membership information for the small and large group blocks.

(b) (3 points) Calculate the incurred but not reported (IBNR) claims on the emerging small group block as of June 20X2. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

# 1. Continued

- (c) (1 point) Assess whether the methodology prescribed is appropriate in this situation. Justify your response.

ANSWER:

- (d) (3 points) Explain how the following situations may affect your IBNR methodology and estimate:

- i. EMC installs a new claim adjudication system which accelerates reporting and payment times.

ANSWER:

- ii. A pandemic causes widespread and sustained closures of medical offices.

ANSWER:

- iii. The small group block becomes subject to a risk adjustment mechanism.

ANSWER:

- iv. The small group block only offers high-deductible health plans.

ANSWER:

- v. EMC experiences an increase in the proportion of its total claims that are inpatient claims.

ANSWER:

- vi. EMC changes its provider reimbursements from a fee-for-service model to a capitation model.

ANSWER:



# **Exam GH 201-C**

## **Learning Objective 2**

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## GH FVCC Fall 2020 #2.

(13 points) You are the actuary responsible for the implementation of the International Financial Reporting Standard (IFRS) 17 at XYZ Life Insurance Company.

- (a) (1 point) Briefly describe the three "building blocks" under IFRS 17 to measure insurance contract liabilities.

ANSWER:

- (b) (1 point) List considerations for using provisions for adverse deviations (PfADs) to determine the risk adjustment for non-financial risk.

ANSWER:

- (c) (1 point) Compare how the discount rate is determined under the Canadian Asset Liability Method (CALM) versus IFRS 17.

ANSWER:

- (d) (2 points) List and describe the approaches to develop the discount rate curve under IFRS 17.

ANSWER:

- ~~(e) (2 points) Describe the decision process in determining the level of aggregation when valuing insurance contracts under IFRS 17.~~

ANSWER:

## 2. Continued

You are given the following information for an IFRS 17 grouping, which consists of two group insurance contracts:

	Contract #1	Contract #2
Rate guarantee (quarters)	4	8
Initial Contractual Service Margin (CSM)	\$25,000	\$200,000

	Contract #1		Contract #2	
	Maximum benefit coverage	Expected total premiums per quarter	Maximum benefit coverage	Expected total premiums per quarter
Health	\$500,000	\$50,000	N/A	N/A
Dental	\$2,500	\$25,000	N/A	N/A
Short Term Disability	\$1,000	\$25,000	N/A	N/A
Long Term Disability	\$50,000	\$50,000	N/A	N/A
Life	\$50,000	\$25,000	\$100,000	\$1,000,000

- Lapse rates are assumed to be 5% per quarter
- Insurance finance expenses and interest rate are assumed to be zero
- Coverage is the same for all certificates insured within a contract

- (f) (4 points) Calculate the amortized amount of the CSM for each quarter under the following approaches:
- (2 points) Simple sum of the various contractual coverages
  - (2 points) Normalization of the coverage units based on expected premiums

State any assumptions and show your work.

<i>The response for this part is to be provided in the Excel spreadsheet.</i>
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## 2. Continued

- (g) (1 point) Recommend which one of the two approaches listed in part (f) produces the best proxy for the aggregate quantity of services provided. Justify your answer.

ANSWER:

- (h) (1 point) Propose another proxy for coverage units for this group of contracts. Justify your answer.

ANSWER:

### **GH FVCC Spring 2021 #3.**

(9 points) You are the valuation actuary at Canadian Healthy Living (CHL) responsible for reporting results of the Life Insurance Capital Adequacy Test (LICAT). CHL is a federally regulated life insurance company that issues fully insured Group Long Term Disability (LTD) insurance to mid-size employers across Canada.

- (a) (2 points) Describe the risk components that are considered in the calculation of the CHL's capital requirements with respect to LICAT.

ANSWER:

- (b) (2 points) Explain how the required capital for morbidity risk is determined for group LTD products.

ANSWER:

### 3. Continued

You are given the following information:

#### Balance Sheet - December 31, 2020

<b>Assets (\$000,000)</b>	
Cash and cash equivalents	15
Bonds	80
Mortgages and other loans	20
Other Assets	0
<b>Liabilities (\$000,000)</b>	
LTD reserves	100
Incurred but not reported (IBNR) claims reserves	10
<b>Equity (\$000,000)</b>	
Common Share Capital	5

#### CHL's Actuarial Report - December 31, 2020

<b>Provisions for Adverse Deviations (PfADs) – Included in Balance Sheet Liabilities (\$000,000)</b>	
PfADs relating to scenario assumptions for risk-free interest rates	2.0
PfADs relating to credit spreads and investment expenses	0.5
PfADs relating to termination assumptions	6.0
PfADs relating to CPP/QPP offset assumptions	0.5
PfADs relating to expenses	1.0

- The aggregate capital requirements for the risks identified in (a) are \$12 Million.
- There are no diversification credits.

(c) (2 points) Calculate:

- LICAT total ratio
- LICAT core ratio

State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

### 3. Continued

- (d) (1 point) Assess the financial health of CHL based on the results obtained in (c). Justify your answer.

ANSWER:

You are given the following additional information:

- CHL's whole bock of business will be renewing on January 1, 2022
  - Projected 2022 renewal premiums of \$20 Million
  - Aggregate capital requirements are \$12 Million
  - Target Return on Equity (ROE) is 12%
  - After-tax return on capital and surplus is 2%
  - Target LICAT ratio is 110%
  - Tax rate is 20%
- (e) (2 points) Calculate the operating profit margin that should be included in CHL's renewal premiums to achieve its target Return on Equity. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

**Question 5 pertains to the Case Study**  
<https://www.soa.org/49c5a4/globalassets/assets/files/edu/2021/spring/exams/spring-2021-exam-ghfy-case-study.pdf>

## **GH FVCC Spring 2021 #5.**

(9 points) You are an actuarial consultant hired by Living Daylights to prepare the sources of earnings (SOE) analysis.

- (a) (1 point) Describe how group insurance businesses are classified for a SOE analysis.

ANSWER:

- ~~(b) (2 points) List and describe the components of a SOE analysis to be included under the following categories:~~

~~(i) (1 point) Management Actions~~

~~(ii) (1 point) Basis Changes~~

ANSWER:

You are given the following information from Living Daylights' 2019 budget:

- Expected premium is \$7,660,000 and other revenue income is \$1,542,000
- Expected benefit expense, commissions, general and administrative expenses and premium taxes are proportional to premium growth
- Expected net investment income, interest expense and amortization of other intangible assets are the same as 2018 actual
- There is zero expected net realized gain or loss on investments

During the year 2019, Living Daylights did not issue any new business and did not impose any management actions or changes in assumptions.

- (c) (2 points) Create the minimum disclosure of SOE analysis for 2019, as required by the Office of the Superintendent of Financial Institutions (OSFI). State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 5. Continued

When reviewing the 2019 results, Daylights' Chief Financial Officer noticed that the net income changed significantly from 2018.

- (d) (2 points) Explain the source of income differences. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

Living Daylights is considering offering refund options to health and dental businesses and adding a new long-term disability (LTD) line of business.

- (e) (1 point) Compare the pattern of earnings of LTD with other group short-term liability products.

ANSWER:

- (f) (1 point) Explain how refund businesses impact the methodology of SOE analysis.

ANSWER:

### **GH FVCC Fall 2021 #3.**

(10 points) You are the actuary responsible for the reporting of the Life Insurance Capital Adequacy Test (LICAT) at XYZ.

- (g) (4 points) Explain how the required capital component for morbidity risk is calculated for the following group insurance products:
- (i) Short Term Disability
  - (ii) Long Term Disability
  - (iii) Health and Dental

ANSWER:

- (b) (2 points) Describe the two adjustments to the insurance risk required capital formula to account for special policyholder arrangements.

ANSWER:

### 3. Continued

You are given the following:

Insurance risk	Gross component (IR <sub>i</sub> )	Level and trend components (LT <sub>i</sub> )
Mortality	\$900,000	\$600,000
Longevity	\$2,000	\$2,000
Morbidity – incidence	\$60,000	\$20,000
Morbidity – termination	\$5,000	\$3,000
Lapse sensitive	\$400,000	\$250,000
Lapse supported	\$150,000	\$90,000
Expense	\$20,000	\$0

Risk	Component
Credit risk	\$400,000
Market risk	\$150,000
Property and casualty risk	\$50,000

- Insurance Risk Requirement = \$761,903

(c) (3 points) Calculate the following:

- Diversified Risk Requirement (D)
- Undiversified Risk Requirement (U)
- Adjusted Diversified Requirement (K)

State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

(d) (1 point) Assess the impact of K on LICAT ratios. Justify your response.

ANSWER:

## GH FVCC Fall 2021 #5.

(8 points) You are the actuary responsible for the implementation of the International Financial Reporting Standards (IFRS) 17 at XYZ Life Insurance Company (XYZ) in Canada.

- (a) ~~(1 point) List the key differences in comparing a valuation under IFRS 17 to the current valuation practice under Canadian GAAP.~~

ANSWER:

- (b) (1 point) Describe how IFRS 17 will impact the role of the appointed actuary.

ANSWER:

XYZ offers individual term life insurance products and fully insured group insurance products (Life, Short Term Disability, Long Term Disability, Health and Dental).

- (c) (2 points) Propose an appropriate measurement method for each of XYZ's products. Justify your answer.

ANSWER:

The individual pricing team of XYZ is planning to launch a renewable 10-year term individual life insurance product in 2022. The expected cash flows and assumptions for the base scenario are provided in the Excel spreadsheet.

- (d) (2 points) Create the reconciliation of:

- (i) (1 point) Risk Adjustment
- (ii) (1 point) Contractual Service margin

State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (e) ~~(2 points) Construct a mock-up of a Profit and Loss statement under IFRS 17 for XYZ without providing any numbers.~~

*The response for this part is to be provided in the Excel spreadsheet.*

## GH FVC Spring 2022 #7.

(7 points) You are a group benefits actuary who specializes in financial analysis and reporting for a Canadian insurance carrier. As part of its group insurance operations, the company sells fully insured Long Term Disability (LTD) and health & dental products.

Your colleagues have shared with you the following financial results and pricing assumptions for the LTD, health and dental products:

<b>Annual Income Statement items</b>	<b>Actual</b>	<b>Plan</b>
<b>Year-ending December 31, 2021</b>	<b>(\$000)</b>	<b>(\$000)</b>
<b>Revenues</b>		
Gross premiums	372,000	350,000
Premiums ceded	-19,440	-20,250
Net premiums	352,560	329,750
Investment Income from assets supporting LTD liabilities	3,700	3,000
Investment Income from assets supporting surplus	500	500
<b>Total Revenues</b>	<b>356,760</b>	<b>333,250</b>
<b>Benefits and expenses</b>		
Gross benefits and claims	310,710	293,000
Ceded benefits and claims	-17,250	-17,500
Change in contract liabilities	9,180	10,000
Change in reinsurance assets	-4,590	-5,000
Commissions	14,880	14,000
General expenses	19,420	16,750
Premium taxes	11,160	10,500
<b>Total Benefits and Expenses</b>	<b>343,510</b>	<b>321,750</b>

<b>Contract Liabilities</b>	<b>Actual</b>	<b>Plan</b>
Gross LTD Reserves on January 1 <sup>st</sup> , 2021	165,000	165,000
Normal Change in claims liabilities	8,530	10,000
Impact of new valuation system	650	-
Gross LTD Reserves on December 31, 2021	174,180	175,000

<b>Pricing assumptions as a percentage of premium:</b>	<b>LTD</b>	<b>Health &amp; Dental</b>
Administrative and claim management expenses	6.50%	4.50%
Commissions	4.00%	4.00%
Premium tax	3.00%	3.00%
Profit margin	5.00%	2.50%

## 7. Continued

- The “plan” was produced using best estimate assumptions
- The company has a 50% coinsurance reinsurance arrangement for its LTD business and receives a 9.5% expense allowance from the reinsurer
- Interest earned on assets backing LTD contract liabilities was expected to be 3% while the actual interest earned in 2021 was 3.5% (calculated on the average of beginning and end of period reserves)
- The corporate tax rate is 20%

Your boss has asked for a report showing the annual financial results of the group insurance line of business as expected by the Office of the Superintendent of Financial Institution (OSFI) for the disclosure of a company’s Source of Earnings (SOE).

(a) — (2 points) Calculate the following by completing the table:

	<b>Year 2021</b>
<del>Expected Profit on In-Force Business</del>	
<del>Experience Gains &amp; Losses</del>	
<del>Management Actions and Changes in Assumptions</del>	
<del>Earnings on Operations (pre-income tax)</del>	
<del>Earnings on Surplus</del>	
<del>Income before Income Tax</del>	
<del>Income Taxes</del>	
<del>Net Income</del>	

~~State any assumptions and show your work.~~

*The response for this part is to be provided in the Excel spreadsheet.*

## 7. Continued

Your boss has requested some additional insight.

(b) (3 points) Calculate the following:

(i) (1 point) Experience gain (or loss) from investment income

*The response for this part is to be provided in the Excel spreadsheet.*

(ii) (1 point) Experience gain (or loss) from reinsurance

*The response for this part is to be provided in the Excel spreadsheet.*

(iii) (1 point) Experience gain (or loss) from expenses, commissions and premium tax (combined)

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

Your boss is new to the group insurance line of business and would like to understand the differences between SOE for individual insurance and group insurance.

(c) (2 points) Describe the reasons for these differences assuming the simplified approximation to the Canadian Asset Liability Method (CALM) methodology is used for group insurance.

ANSWER:

*The Excel spreadsheet has  
additional data and information applicable to this question.*

### **GH FVC Fall 2022 #7.**

*(9 points)* You are the actuary responsible for the implementation of the International Financial Reporting Standards (IFRS) 17 at XYZ Life Insurance Company (XYZ) in Canada. XYZ sells individual life insurance products as well as group insurance products.

(a) *(2 points)* Explain the IFRS 17 accounting treatment related to:

(i) Amounts on deposit

ANSWER:

(ii) Experience rating

ANSWER:

(iii) Claims fluctuation reserves / Premium stabilization reserves

ANSWER:

(iv) Administrative Services Only (ASO) contracts

ANSWER:

## 7. Continued

XYZ is planning to launch a renewable 10-year term individual life insurance product in 2023.

The Excel spreadsheet provides the expected cash flows and assumptions for the base scenario.

(b) (4 points) Create the following missing reporting sections in the Excel spreadsheet:

(i) (1 point) Reconciliation of Acquisition Expense Amortization

*The response for this part is to be provided in the Excel spreadsheet.*

(ii) (3 points) Statement of Profit or Loss

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

## 7. Continued

You have been asked to classify XYZ expenses for IFRS 17 purposes.

You are aware that expenses related to investment management, asset liability management and risk management are sometimes directly attributable to insurance contracts.

- (c) (2 points) List examples of other expenses that would generally be considered directly attributable to an insurance contract.

ANSWER:

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.

- (d) (1 point) Explain to the auditor why your rationale is correct.

ANSWER:

**Question 12 pertains to the Case Study.  
Each question should be answered independently.**

<https://www.soa.org/4ac731/globalassets/assets/files/edu/2022/spring/exams/fall-2022-exam-ghfvc-case-study.pdf>

## **GH FVC Fall 2022 #12.**

(10 points) You are the Subject Matter Expert at Skyfall for everything related to financial reporting. The Chief Financial Officer (CFO) at Quantum has contacted you to help understand Quantum's financial results.

(a) (2 points) Calculate the following metrics for Year 3 and Year 4:

(i) Total leverage ratio

*The response for this part is to be provided in the Excel spreadsheet.*

(ii) Total asset turnover

*The response for this part is to be provided in the Excel spreadsheet.*

(iii) Net profit margin

*The response for this part is to be provided in the Excel spreadsheet.*

(iv) Return on assets

*The response for this part is to be provided in the Excel spreadsheet.*

(v) Return on equity

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

## 12. Continued

- (b) (1 point) Explain the deterioration between Year 3 and Year 4 using the DuPont formula. Justify your answer.

ANSWER:

- (c) (2 points) List and describe the types of financial analysis where ratios in part (a) can be applied.

ANSWER:

## 12. Continued

You are given the following Year 4 supplemental information on Skyfall:

	<b>Individual HMO (\$000s)</b>	<b>Individual PPO (\$000s)</b>	<b>Individual Grandfathered (\$000s)</b>	<b>Total (\$000s)</b>
Administrative fees income	9	3	8	20
Miscellaneous income	498	141	413	1,052
Net Investment income	392	111	325	828
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

(d) (2 points) Create the same-size income statements for Year 4 for the following individual plans:

(i) HMO plans

*The response for this part is to be provided in the Excel spreadsheet.*

(ii) PPO plans

*The response for this part is to be provided in the Excel spreadsheet.*

(iii) Grandfathered plans

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

## 12. Continued

- (e) (2 points) Create the per member per month (PMPM) income statements for Year 4 for the following individual plans:

- (i) HMO plans

*The response for this part is to be provided in the Excel spreadsheet.*

- (ii) PPO plans

*The response for this part is to be provided in the Excel spreadsheet.*

- (iii) Grandfathered plans

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

- (f) (1 point) Propose four solutions to improve the financial performance of Quantum. Justify your proposal.

ANSWER:

## GH VRC Spring 2023 #4.

(11 points) You are the appointed actuary at XYZ insurance company. Recently, XYZ acquired a closed block of individual long-term disability (LTD) business from ABC insurance company (ABC). The closed block is composed entirely of disabled individuals.

(a) LEARNING OBJECTIVE 1

(1 point) Identify the types of liabilities that XYZ would need to hold for the acquired block from ABC. Justify your response.

ANSWER:
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You are provided with the following sample policyholder data as a model representative point for the acquired block of ABC:

	<b>Sample Policyholder A</b>
Status	Disabled
Valuation date	December 31, 2022
Date of birth	December 31, 1967
Date of disability	June 30, 2016
Elimination Period	6 months
Benefit termination age	65
Annual benefit payment after Elimination Period	\$30,000, paid annually on December 31
Cost of Living Adjustment (COLA)	2%, applied annually at the beginning of each calendar year
Contractual Service Margin (CSM) balance as at the valuation date	\$25,000

	<b>Valuation assumptions</b>
Locked-in discount rate	4.0% per annum
Asset earned rate	4.5% per annum
CSM accretion rate	3.0% per annum

### 2022 Claims Termination Rate Study

Claims Duration	Year 1	Year 2	Year 3	Year 4+
Expected Termination (per 1,000 lives)	500	150	75	200
Actual Terminations (per 1,000 lives)	350	200	100	150

#### 4. Continued

- (b) ~~(1 point) Calculate a best estimate tabular claim reserve for Policyholder A as of the valuation date. State any assumptions and show your work.~~

~~The response for this part is to be provided in the Excel spreadsheet.~~

As IFRS 17 became effective for the period beginning on January 1<sup>st</sup>, 2023, XYZ is exploring the different IFRS 17 approaches for the recognition of future revenues on the acquired block of business.

- (c) (2 points) Compare and contrast the following approaches for revenue recognition under IFRS 17:

- (iii) Liability for Incurred Claims (LIC) approach

ANSWER:

- (iv) Liability for Remaining Coverage (LRC) approach

ANSWER:

- (d) (4 points) Construct the CSM amortization schedule as of the valuation date under the following approaches, using Policyholder A as a representative point for the acquired block of business:

- (iii) LIC approach

The response for this part is to be provided in the Excel spreadsheet.

- (iv) LRC approach

The response for this part is to be provided in the Excel spreadsheet.

State any assumptions and show your work.

- (e) (1 point) Recommend an approach for XYZ for revenue recognition of the acquired block of business. Justify your answer.

ANSWER:

#### 4. Continued

You have concerns over the recent claims termination experience at ABC insurance company.

- (f) ~~(1 point) Critique the 2022 claims termination rate study based on actual to expected (A/E) ratios. State any assumptions and show your work.~~

*The response for this part is to be provided in the Excel spreadsheet.*

- (g) ~~(1 point) Propose questions that XYZ should ask to ABC in order to get a deeper understanding of their 2022 experience study results.~~

**ANSWER:**

*The Excel spreadsheet has  
additional data and information applicable to this question.*

### **GH VRC Spring 2023 #7.**

*(12 points)* You are the appointed actuary of XYZ Life Insurance company overseeing the annual filing process of Financial Condition Testing (FCT) and Life Insurance Capital Adequacy Test (LICAT). XYZ offers individual and group life products to Canadians.

When FCT replaced Dynamic Capital Adequacy Testing (DCAT) in 2019, some revisions were made to the Standard of Practice (SOP) to reflect the change.

- (a) *(2 points)* List the changes to the SOP related to the introduction of FCT.

ANSWER:

- (b) *(2 points)* List and describe key elements of:

- (i) FCT

ANSWER:

- (ii) LICAT ratios

ANSWER:

## 7. Continued

- (c) (2 points) Describe how the Base Solvency Buffer is determined in LICAT.

ANSWER:

You have been asked to calculate the required capital for the mortality risk component on a block of individual death supported policies.

You are given the following information as of December 31, 2022:

Best estimate mortality improvement assumption	None
Total net amount at risk for all policies	\$285,526
Total net face amount for all policies	\$390,363
Projected value of the upcoming year's total net death claims for all policies:	\$8,075
$\sum b^2$ where b is the net death benefit amount for a given policy	\$6,549,886
Spot discount rate	5.3%

The Excel spreadsheet provides the liability cash flows under various mortality shock scenarios.

- (d) (4 points) Calculate the required capital for the mortality risk component as of December 31, 2022. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

Before publicly disclosing the annual results for 2022, the external auditor has peer reviewed your LICAT calculation and indicates to you that the block of individual policies should had been classified as "life supported" instead of "death supported".

- (e) (2 points)

- (i) Justify why the auditor statement is incorrect. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (ii) Explain how the required calculation for the mortality risk component would have been different if the auditor statement was true.

ANSWER:

## GH VRC Fall 2023 #5.

(13 points) You are an actuary at MNO Insurance, a health insurance carrier. Part of your role includes the IFRS 17 implementation for an innovative 4-year term product that MNO is preparing to launch.

The newly appointed chief actuary has requested that you classify expenses associated with this new product according to IFRS 17.

- (a) (1 point) Describe the two interpretations of directly attributable expenses.

ANSWER:

You are given the following expense items associated with the new 4-year term product:

Expense Items	Timing of expense	(\$000s)
Claim handling	Recur annually	3
Company holiday party	Recur annually	4
Insurance company tax filing	Recur annually	3
Recruitment of employees working for the product	Incur prior to issuance	2.5
Investment management	Recur annually	17
Marketing	Incur prior to issuance	10
Policy issuance	Incur prior to issuance	5
Pricing	Incur prior to issuance	16.5
CEO salary	Recur annually	8
Services of external risk management consultants	Recur annually	15
Statutory reporting	Recur annually	12
Medical underwriting	Incur at inception	12
Other directly attributable expenses	Incur prior to issuance	45
Other non-directly attributable Expenses	Incur at inception	30

- (b) (1 point) Calculate the following:

- (i) Directly attributable expenses

*The response for this part is to be provided in the Excel spreadsheet.*

- (ii) Non-directly attributable expenses

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

## 5. Continued

The chief actuary has also requested that you prepare a projected statement of profit or loss for the new product.

You are given the following information in addition to the calculated expenses in part (b):

Items	Timing	(\$000s)
Premiums	paid up-front	1,500
Claims	per annum	200

- No risk adjustment or discounting
- Contractual Service Margin (CSM) is run-off on a straight-line basis
- No inflation on maintenance expenses
- Claims and expenses occur as expected

- (c) (4 points) Create the projected statement of profit or loss that covers the duration of the product. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

You discussed your projections with the chief actuary who has raised concerns that you did not vary the expenses by year.

- (d) (1 point) Describe the primary factors affecting directly attributable expense projections.

ANSWER:

The chief actuary has reviewed your projected statement of profit or loss and suggested that according to the guidelines outlined in IFRS 17, there can be instances where the classification of expense items becomes uncertain or ambiguous. She recommended that expense items falling within the grey area should be treated using the alternative interpretation of directly attributable.

- (e) (3 points) 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.

*The response for this part is to be provided in the Excel spreadsheet.*

## 5. Continued

(f) (1 point)

- (i) Recommend which interpretation of directly attributable expenses you should use based on your calculations in part (c) and (e). Justify your answer.

ANSWER:

- (ii) Recommend actions that should be taken in implementing the interpretation in (i). Justify your answer.

ANSWER:

Given the current tumultuous economic conditions, the chief actuary has requested additional projections depicting a scenario with a 20% increase in claims and directly attributable expenses.

(g) (2 points)

- (i) Identify the key elements of Financial Condition Testing (FCT).

ANSWER:

- (ii) Propose corrective management actions in response to this scenario. Justify your answer.

ANSWER:

## GH VRC Fall 2023 #7.

(9 points) You are the valuation actuary at XYZ Life Insurance company (XYZ) responsible for overseeing the annual filing process of the Life Insurance Capital Adequacy Test (LICAT).

(a) (2 points)

- (i) List and describe each component in the formulas for the Total Ratio and Core Ratio.

ANSWER:

- (ii) State the minimum and the supervisory target for the ratios in (i).

ANSWER:

XYZ offers a bundled group plan consisting of Long-Term Care (LTC) and term life insurance with the following characteristics:

- The LTC coverage provides up to 48 months of benefits should the insured require assistance with activities of daily living (ADLs)
- The term life coverage provides a payment of \$1,000,000 on the death of the insured
- The plan includes a waiver of premium provision and is subject to individual medical underwriting
- Premiums are guaranteed for 5 years

(b) (4 points)

- (i) List and describe the insurance risk components required for the bundled plan.

ANSWER:

- (ii) Describe the steps to calculate each component in (i), including shock factors.

ANSWER:

## 7. Continued

You are provided with the following balance sheet information:

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

- (c) (3 points) Calculate the DTA Temporary amount included in available capital. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## **GH VRC Spring 2024 #2.**

*(5 points)*

(a) *(1 point)*

(i) Describe the Gordon Constant Growth Model (GCGM).

ANSWER:

(ii) Describe why the GCGM assumes the price-to-earnings (P/E) ratio of companies with high growth rates will be expected to drop in a context of rising interest rates.

ANSWER:

(b) *(1 point)* Describe why stock prices are imperfect metrics for the financial analysis of health plans.

ANSWER:

Portwater Health is considering a merger with Carabelle Insurance Company.

In the Excel spreadsheet, you are provided with the financial information for both companies in Exhibit 1.

(c) *(1 point)* Calculate the following performance metrics for Portwater and Carabelle separately. Show your work.

(i) Total Asset Turnover

(ii) Return on Assets

(iii) Total Leverage Ratio

(iv) Return on Equity

*The response for this part is to be provided in the Excel spreadsheet.*

## 2. Continued

- (d) (1 point) Calculate the two annual profit margin ratios most commonly used by financial analysts for Carabelle and Portwater separately. Show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

Your intern made the following statements:

- GAAP profit margins for insured businesses are overstated relative to statutory profit margins.
  - "Same-size" analyses are done on a per capita basis to reflect the impact of size on operating measures.
- (e) (1 point) Critique the accuracy of the intern's statements. Justify your answer.

ANSWER:

### **GH VRC Spring 2024 #3.**

(4 points) Company X, a regional, publicly-traded insurer, entered the health insurance market in State A two years ago.

(a) (2 points)

- (i) State reasons why Company X would want to compare its financial ratios to its competitors.

ANSWER:

- (ii) List characteristics that, when similar, improve comparisons of financial ratios between Company X and competitors.

ANSWER:

Megacorp is a national, publicly-traded health insurer and is the largest competitor in State A. You have been asked to focus your comparison on Megacorp and its subsidiaries:

- Juniorcorp, operating in State A
- RegionalCare, a regional HMO health insurer that Megacorp has recently acquired

(b) (2 points)

- (i) Identify sources of data you could use to prepare your comparison.

ANSWER:

- (ii) Describe factors you should consider when evaluating the data sources identified in part (b)(i).

ANSWER:

## GH VRC Spring 2024 #8.

(11 points) You are the actuary at XYZ responsible for the valuation of Life Insurance Capital Adequacy Test (LICAT).

You are given the following information on a closed block of Group Long-Term Disability (LTD) policies as of December 31, 20X1:

Number of disabled lives in the closed block	100, all age 45
Best estimate probability of claim termination	1% per month, no morbidity improvement
Monthly benefit	\$2,000 per month, up to age 65 Payable at the end of the month No indexation and no offset
Maintenance expenses	\$75 per month, increasing 0.2% per month
Spot discount rate	5.30%

(a) (2 points)

- (i) List and describe the risk components that are considered when calculating the morbidity risk.

ANSWER:

- (ii) Explain how the risk components in (i) apply to your block of business.

ANSWER:

(b) (4 points) Calculate the value of total components for the following risks in LICAT as of December 31, 20X1:

- (i) Morbidity risk

*The response for this part is to be provided in the Excel spreadsheet.*

- (ii) Expense risk

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

## 8. Continued

Under IFRS 4, you selected a margin for the termination rates that is within the range recommended from the CIA Standard of Practice. Your boss has asked if you could use the same margin for the risk adjustment for non-financial risk under IFRS 17.

(c) (4 points)

- (i) Describe the requirements for selecting Provisions for Adverse Deviation (PfADs) under IFRS 4.

ANSWER:

- (ii) Describe the requirements to determine the risk adjustment for non-financial risk under IFRS 17.

ANSWER:

- (iii) Describe the considerations for using PfADs to determine the risk adjustment for non-financial risk.

ANSWER:

- (d) (1 point) Explain how the selected risk adjustment for non-financial risk will impact your LICAT ratio.

ANSWER:

*The Excel spreadsheet has  
additional data and information applicable to this question*

## **GH VRC Fall 2024 #4.**

(12 points) As the valuation actuary at XYZ Life Insurance Company, a federally regulated entity providing individual and group life and health insurance products throughout Canada, you are responsible for overseeing the annual filing process for the Life Insurance Capital Adequacy Test (LICAT).

- (a) (1 point) List the risk components that are considered in the determination of XYZ's capital requirements in accordance with the LICAT framework.

ANSWER:

- (b) (4 points) Explain how to determine the required capital for the different insurance risk components involved with each of the following products:

- (i) Group Life, including Waiver of Premium

ANSWER:

- (ii) Group Critical Illness

ANSWER:

- (c) (2 points)

- (i) Contrast the following:

- Minimum Ratio
- Supervisory Target Ratio

ANSWER:

- (ii) State the minimum threshold for each of the ratios mentioned in part (i).

ANSWER:

#### 4. Continued

(iii) Define the following:

- Total Ratio
- Core Ratio

ANSWER:

In the Excel spreadsheet, you are provided with the following financial information for XYZ:

- Balance Sheet
- Risk Components
- Scalar

(d) (3 points) Calculate the following:

- (i) Total Ratio
- (ii) Core Ratio

State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

(e) (1 point) Assess the implications of XYZ's capital ratios calculated in (d).

ANSWER:

(f) (1 point) Recommend two actions that could be implemented by XYZ to improve their capital ratios calculated in (d). Justify your answer.

ANSWER:

## GH VRC Fall 2024 #6.

(13 points) You are a valuation manager at XYZ Insurance Company, which specializes in selling term life insurance products. The year is 2022 and you are playing a pivotal role in leading XYZ's transition to IFRS 17.

(h) (2 points)

i. Describe the concept of Contractual Service Margin (CSM).

ANSWER:

ii. Define the three "building blocks" used in the measurement of insurance contract liabilities under the General Measurement Approach (GMA).

ANSWER:

iii. Describe how each "building block" under the GMA compares to the Canadian Asset Liability Method (CALM).

ANSWER:

In the Excel spreadsheet, you are provided with the following information:

- A summary of projections for term life business to be issued in 2023
- Valuation assumptions

XYZ's term life block of business will be assessed using the GMA.

(i) (3 points) Calculate the components of the liability on initial recognition as of January 1, 2023. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 6. Continued

- (j) (2 points) Construct the CSM Amortization Schedule for years 2023 to 2032. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (k) (1 point) Calculate the components of the Insurance Financial Expense for the year 2023. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (l) (2 points) Construct the Statement of Expected Profit or Loss for the year 2023. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

In 2024, XYZ plans to diversify its portfolio by introducing medical and stop-loss drug insurance products. To attract customers, it is anticipated that some of the policies will be offered at significantly discounted prices.

- (m) (1 point) Explain how insurance companies need to segment their insurance contracts according to IFRS 17.

ANSWER:

- (n) (2 points) Recommend portfolios XYZ should include in their 2024 accounting disclosure according to IFRS 17. Justify your response.

ANSWER:



# **Exam GH 201-C**

## **Learning Objective 3**

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### **GH FVCC Fall 2020 #3.**

(9 points) You are the actuary for the multi-employer benefits plan of United Workers, an Ontario-based union where employers are parsed into two groups:

- Outdoor workers (12 employers)
- Indoor workers (6 employers)

Outdoor workers typically retire prior to age 65 and several years earlier than their indoor counterparts. To ensure there is no gap in health coverage, United Workers has demanded that the employers continue to provide prescription drug coverage for retirees until they reach age 65 and become eligible for the Ontario Drug Benefit (ODB). After several rounds of constructive negotiations, the outdoor employers have agreed to provide prescription drug benefits for all pre-65 retirees, with two significant caveats:

- The coverage will be provided for the retiree only (i.e. no other dependents)
- The employers are to fund the benefits through an independently run Employee Life & Health Trust (ELHT)

(a) (1 point) Describe the key features of ELHTs.

ANSWER:

(b) (1 point) Explain ELHT's requirements as it relates to "key employees".

ANSWER:

### 3. Continued

The employers are required to make a one-time contribution on January 1, 2020 to the ELHT to cover expected expenses during the four-year period of the collective bargaining agreement from January 1, 2020 to December 31, 2023. The contribution will be invested in a mix of assets and liquidated to make benefit payments as needed. You have been asked to assist United Workers in developing appropriate contributions to present to the employers. To assist, you are provided with the following information:

- Discount rate: 2.5% per annum
- Trend rate: 6.5% per annum in 2020 grading down to 4.0% per annum over 20 years
- Aging/morbidity: 2.0% per year at ages 55 through 65
- Expected claim cost (per employee per year) including administrative expenses and taxes, measured in July 1, 2020 dollars:
  - Age 55 outdoor retiree: \$1,500
  - Age 55 indoor retiree: \$900
- Corporate tax rate: 40.0%
- Highest marginal tax rate: 50.0%
- Projected retiree demographics:

Year	Pre-65 Outdoor Retirees		Pre-65 Indoor Retirees	
	Number	Average Age	Number	Average Age
2020	527	59.1	105	63.1
2021	586	58.9	106	62.9
2022	592	59.3	112	62.8
2023	608	59.8	114	62.7

- (c) (3 points) Calculate the contribution required from:
- (i) Outdoor employers
  - (ii) Indoor employers

State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

### 3. Continued

(d) (1 point) Calculate the 2020 tax return refund the employers would receive under the following scenarios:

- (i) All employers participate in the ELHT
- (ii) Only the outdoor employers participate in the ELHT

State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

A final decision was made to include both indoor and outdoor employers in the ELHT. The pandemic of 2020 significantly altered actual and expected experience as follows:

- In 2020:
  - The claims experience was 50% of the original projected amount
  - The assets had no return
- In 2021:
  - The claims experience is expected to rebound to 90% of the original projected amount
  - The annual return on assets is expected to be 45% due to a financial market boom

(e) (3 points) Calculate the expected asset balance at the end of 2021. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

**Question 6 pertains to the Case Study**  
<https://www.soa.org/4ad5e8/globalassets/assets/files/edu/2020/fall/exams/edu-2020-fall-ghfvcc-exam-case-study.pdf>

### **GH FVCC Fall 2020 #6.**

(10 points) You are the consulting actuary at Skyfall for Another Day.

- (a) (1 point) List the regulatory filings that Assuris receives from member companies.

ANSWER:

You are given the following information for two employees at Another Day for the year 2020:

	Mary	John
Annual salary	\$150,000	\$50,000
Family status	Single	Family
Province	Ontario	Quebec
Annual drug eligible expense	\$1,850	\$164,000
Annual employee out-of-pocket	\$95	\$1,000

- Health Spending Accounts (HSA) have no credit carry forward from the prior year.
  - Other than drugs, there is no other eligible health expenses for Mary and John.
- (b) (2 points) Calculate the amounts guaranteed by Assuris for Mary and John for each group benefit offered by Another Day. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 6. Continued

During the previous two years, all health expenses for John were incurred for a catastrophic drug with an annual cost above \$150,000.

- (c) (1 point) Calculate the pooled amount for Mary and John under the following industry programs:
- (i) Quebec Drug Insurance Pooling Corporation (QDIPC)
  - (ii) Canadian Drug Insurance Pooling Corporation (CDIPC)

State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

Due to cost pressure, Another Day has recently decided to modify the level of its contribution toward employee benefits to have employees assume the full cost of Short Term Disability (STD) and Long Term Disability (LTD).

- (d) (3 points) Calculate the amounts of taxable benefit at the Federal and Provincial levels for Mary and John. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

Another Day is exploring the idea of converting its LTD plan to a self-insured basis.

- (e) (1 point) Critique this idea. Justify your answer.

ANSWER:

- (f) (2 points) Describe the regulatory regime for Canadian Life and Health insurers pertaining to LTD.

ANSWER:

## **GH FVCC Spring 2021 #1.**

(6 points) You work at an insurer and are responsible for the administration of Company XYZ's Canadian group benefits program. The program includes out-of-country emergency medical benefit for retirees with the following provisions:

- Retirees must reside in Canada
- No pre-existing exclusions or limitations
- Lifetime maximum claim limit of \$50,000
- Coverage is 100% of eligible expenses

(a) (2 points) Describe the main components of out-of-country claims management.

ANSWER:

You have been contacted by a retiree from Company XYZ who has just been hospitalized for a serious heart condition while traveling in the United States. You suspect the retiree could have additional out-of-country coverage elsewhere.

(b) (3 points) Recommend questions you can ask the retiree to ensure you evaluate the coordination of benefits appropriately.

ANSWER:

From your questioning, the retiree confirms that his spouse also has emergency medical out-of-country coverage with a lifetime maximum of \$500,000 through their retiree medical plan. The retiree recovers from his heart condition, however, the cost for his care is \$100,000.

(c) (1 point) Calculate how much would be payable under Company XYZ's retiree plan benefit:

- (i) Without the spouse's plan
- (ii) With the spouse's plan

State any assumptions and justify your answer.

*The response for this part is to be provided in the Excel spreadsheet.*

**Question 6 pertains to the Case Study**  
<https://www.soa.org/49c5a4/globalassets/assets/files/edu/2021/spring/exams/spring-2021-exam-ghfy-case-study.pdf>

## **GH FVCC Spring 2021 #6.**

(10 points) You are a consulting actuary for XYZ Health and Welfare Trust (the Trust). The Trust offers a long term disability (LTD) benefit to its members and is insured through the Thunderball Corporation (Thunderball).

Canadian Pension Plan (CPP) disability benefits are expected to increase by 2% on January 1, 2020.

The Board of Trustees expects that for claimants currently receiving a CPP disability benefit, the net benefit paid by the Trust will be reduced.

- (a) (1 point) Critique the Board of Trustee's expectations.

ANSWER:

The LTD plan has the following provisions:

- Monthly benefit of 66.67% of pre-disability earnings
- Benefit is taxable
- Maximum benefit of \$3,500 per month
- 6 months elimination period
- Definition of disability: 24 month own occupation period
- CPP benefits are direct offsets
- Cost of living adjustment (COLA): None

To assess the impact on reserves, the Board of Trustees has provided you the following information on an active claimant at December 31, 2019:

Claim duration (years)	Current age	Gender	Annual salary	Monthly CPP offset for 2019
4.00	42.08	M	\$55,000	\$800

- (b) (2 points) Calculate the reserve for this claimant at December 31, 2020 using the newest reserve tables of Thunderball. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 6. Continued

The Board of Trustees have expressed interest in self-insuring the LTD benefit. However, history has shown that when a self-insured plan becomes insolvent, disabled employees can lose their benefits.

The Canadian Life and Health Insurance Association (CLHIA) conducted an assessment of potential policy solutions to protect disabled employees.

- (c) (3 points) Describe the results of the CLHIA's assessment.

ANSWER:

The 2018 Federal Budget announced that health and welfare trusts (HWT) are required to convert to employee life health trusts (ELHT) by the end of 2020.

- (d) (2 points) Describe the key features of:

- (i) HWT
- (ii) ELHT

ANSWER:

- (e) (2 points) Compare and contrast the key distinctions between a HWT and an ELHT.

ANSWER:

## **GH FVCC Fall 2021 #2.**

(8 points) You are an actuary working in the tax department of a Canadian Life and Health insurance company.

- (o) (1 point) List and describe the inclusions in net income that are permitted under the special tax provisions applicable to life insurers.

ANSWER:

- (p) (3 points) Describe the deductions from income that are permitted under the special tax provisions applicable to life insurers.

ANSWER:

## 2. Continued

You have been given the following information on three blocks of life insurance policies as at December 31, 2020:

	<b>Universal Life Policy</b>	<b>Group Life Policy</b>	<b>10-year Term Policy</b>
Issue date	01-Apr-16	01-Jul-20	01-Jul-18
Number of Policies	100	1	50
Total life reserves (December 31, 2019)	\$5,695,403	\$0	\$2,175,000
Total life reserves (December 31, 2020)	\$6,291,667	\$250,000	\$2,450,000
Change in experience refund reserve	\$0	\$12,500	\$0
Total policyholder loans in 2020	\$37,500	\$0	\$0
Total policyholder withdrawals in 2020	\$25,000	\$0	\$0
60-month moving average yield on bonds	3.75%	3.75%	3.75%
Investment losses carried forward	\$56,000	\$0	\$0

- (q) (4 points) Calculate the investment income tax on these three blocks of policies as of December 31, 2020. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

**Question 6 pertains to the Case Study**

<https://www.soa.org/4ae4cd/globalassets/assets/files/edu/2021/fall/exams/fall-2021-exam-ghfvcc-case-study.pdf>

**GH FVCC Fall 2021 #6.**

(6 points) ABC is a company located in British Columbia (BC) and offers a supplemental medical plan for its employees on a self-insured basis. Its plan is administered by Living Daylights.

During the benefit review with Living Daylights, the CEO of ABC expressed his concern regarding ABC's significantly higher brand drug utilization relative to its peer companies.

(a) LEARNING OBJECTIVE 4

(1 point) List and describe the three recommendations of the Canadian Life and Health Insurance Association (CLHIA) to ensure affordable prescription drugs in Canada.

ANSWER:

You are given the following information for ABC for 2020:

Annual Salary	Number of employees
\$40,000	50
\$50,000	30
\$60,000	40
\$70,000	20
\$80,000	10
\$90,000	10

- ABC's employees and their salaries will not change in 2021
- The average plan cost, including all taxes and fees, for 2020 is \$92 per employee per month and is 100% paid by ABC
- The group benefits budget for 2021 is the same as in 2020

**6. Continued**

You are also given the following information:

Annual BC Payroll	Employer Health Tax Rate	Maximum Annual Tax
Up to \$500,000	0.00%	\$0.00
\$500,000 - \$750,000	0.98%	\$7,313
\$750,001 - \$1,000,000	1.46%	\$14,625
\$1,000,001 - \$1,250,000	1.76%	\$21,938
\$1,250,001 - \$1,500,000	1.95%	\$29,250
Over \$1,500,000	1.95%	\$29,250 + 1.95% of payroll over \$1,500,000

Assessable earning maximum for BC Workplace Safety & Insurance Board (WSIB)	\$100,000
Year's Maximum Pensionable Earnings	\$61,600
Employment Insurance Maximum Yearly Insurable Earnings	\$56,300
Canada Pension Plan employer rate	5.45%
Employment Insurance employer rate	2.21%
BC WSIB assessment rate	1.55%

The CEO is considering providing a salary increase in 2021 instead of offering the supplemental medical plan.

- (b) LEARNING OBJECTIVE 4  
 (3 points) Calculate the 2021 salary increase that would be cost neutral for ABC. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (c) (1 point) Assess the impact of the proposed change for employees. Justify your answer.

ANSWER:

## 6. Continued

Instead of eliminating its supplemental medical plan entirely, Living Daylights is considering implementing changes to its drug plan.

- (d) LEARNING OBJECTIVE 4  
(1 point) Recommend cost saving options to address the CEO's concern regarding ABC's higher brand drug utilization relative to its peer companies. Justify your answer.

ANSWER:
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**Question 7 pertains to the Case Study**

<https://www.soa.org/4ae4cd/globalassets/assets/files/edu/2021/fall/exams/fall-2021-exam-ghfvcc-case-study.pdf>

**GH FVCC Fall 2021 #7.**

(7 points) You are the consulting actuary at Skyfall for Another Day.

Another Day would like to know how the group benefits they provide to their employees are taxed.

- (a) (1 point) Explain how Another Day can offer each benefit in exhibit 1 on a tax-free basis for employees.

ANSWER:

You are given the following information for Another Day's Health Care Spending Account (HCSA):

- The total HCSA claims paid in 2020 was \$500,000
  - The annual fee charged for administering the plan equals 4% of claims plus \$1,000
  - Distribution of incurred claims by province:
    - 50% Ontario employees
    - 20% British Columbia employees
    - 30% Quebec employees
- (b) (2 points) Calculate the total amount of taxes paid by Another Day for the HCSA benefit. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 7. Continued

Another Day made a change to their vision plan in 2021 so that the plan now covers vision claims up to the reasonable and customary charges.

You are given the following information on Jack, an employee of Another Day:

- Jack's wife, Nichole, has coverage with a different insurer, and her vision plan is "pay as billed" with 80% coinsurance and a \$500 maximum per 24 months
- Nichole submits a vision claim of \$300
- Another Day's reasonable and customary charge for a vision claim is \$220
- Both Nichole and Jack did not have any vision claims in the past 24 months

- (c) (1 point) Calculate the change in the out-of-pocket amount for Jack's family resulting from this plan change. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

Due to the post pandemic economic environment, Another Day wants to decrease the cost of its employee group benefits plan.

You assist Another Day in preparing a request for proposal (RFP) to obtain quotes from group insurers. As a result of the RFP, Another Day is planning to move their group benefits plan to another insurer.

- (d) (1 point) Describe the replacement contract provisions needed to protect current covered employees from loss of insurance.

ANSWER:

- (e) (1 point) Describe what will happen to members who are not actively at work at the termination date of the current insured contract.

ANSWER:

## 7. Continued

Another Day is also considering moving to a non-taxable Long-Term Disability (LTD) plan for its unionized employees, with all other LTD plan specifications remaining the same.

Another Day's unionized employees are classified into 3 categories:

	Category 1	Category 2	Category 3
Annual Salary	\$30,000	\$50,000	\$70,000
Province	Ontario	Manitoba	British Columbia

Assume that LTD premium rates remain unchanged.

- (f) (1 point) Calculate the annual LTD employee cost for each category under a taxable arrangement versus a non-taxable arrangement. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

**Question 10 pertains to the Case Study**

<https://www.soa.org/49add1/globalassets/assets/files/edu/2022/fall/exams/spring-2022-exam-ghfvc-case-study.pdf>

**GH FVC Spring 2022 #10.**

(9 points) The HR director at Another Day just received a market benchmarking report for their group insurance plan. The results demonstrate that the plan for their top executives is worth significantly less than the competitor plans. The director is considering a proposal to add additional compensation or benefits to create a more competitive total compensation package for key employees.

- (r) (1 point) List the principles governing the protection of personal information.

ANSWER:

- (s) (1 point) Describe how a cost-plus plan works.

ANSWER:

## 10. Continued

The HR director has decided to increase the total compensation for the CEO only. The increase has been set at \$20,000 and will be given either in salary only or as a Health Care Spending Account (HCSA) benefit only. Both options will have to take into consideration the impact of taxation and all applicable social program costs.

You are given the following additional information:

- The annual salary of the CEO is \$195,000
- Assume for the CEO a marginal provincial tax rate of 12.16% and a marginal federal tax rate of 29.32%
- The administrative expense rate on HCSA benefits is 3% of claims
- Assume 100% usage of the HCSA
- Canada Pension Plan contribution rate: 5.45%
- Employment Insurance employer rate: 2.21%

(t) (3 points) Calculate the cost for Another Day under each option:

(i) (2 points) Increase given as salary only

*The response for this part is to be provided in the Excel spreadsheet.*

(ii) (1 point) Increase given as HCSA benefit only

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

## 10. Continued

(u) (2 points) Calculate the after-tax value to the CEO under each option:

(i) (1 point) Increase given as salary only

*The response for this part is to be provided in the Excel spreadsheet.*

(ii) (1 point) Increase given as HCSA benefit only

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

(v) (1 point) Recommend which option is the best considering both the value for the CEO and the cost for Another Day. Justify your answer.

ANSWER:

(w) (1 point) Identify area in the current plan design where a \$20,000 increase in benefits could provide better value. Justify your answer.

ANSWER:

*Question 11 pertains to the Case Study*

<https://www.soa.org/49add1/globalassets/assets/files/edu/2022/fall/exams/spring-2022-exam-ghfvc-case-study.pdf>

## **GH FVC Spring 2022 #11.**

(10 points) You are a consulting actuary at Skyfall and have been engaged by Zoomers, a new startup technology company. Zoomers initially had five employees, but has grown to 300 employees across Canada. The CEO is looking to introduce a group benefits plan to attract and retain talent.

All five initial employees have their own individual insurance. The concept of group benefits is relatively new to the CEO, who is considering providing all employees an additional \$3,000 in pay to use towards purchasing individual insurance coverage. Zoomers' benefits objectives are to provide accessible coverage, flexibility, and get maximum value.

(a) (2 points) Compare individual and group insurance with respect to:

(i) Underwriting

ANSWER:

(ii) Premiums

ANSWER:

(iii) Policy provisions

ANSWER:

(b) (1 point) Compare how benefits provided under a group or individual basis could align with Zoomers' objectives.

ANSWER:

## 11. Continued

To meet Zoomers' flexibility objective, Zoomers has decided to move forward with a flexible benefits plan. Coincidentally, Zoomers' health and dental flexible options match the benefit provisions of the Supplemental Medical Plan offered by another client of yours, Living Daylights. In addition, Zoomers would like to increase flexibility by adding a Health Care Spending Account (HCSA), and the ability to buy or sell vacation days. Under the flexible benefit plan, all employees will receive an HCSA amount of \$500 at the beginning of the year.

- (c) (2 points) Describe the rules adopted by the Canada Revenue Agency (CRA) with respect to the roll-over of credits and claims under an HCSA.

ANSWER:

- (d) (1 point) Describe the CRA rules that address buying and selling vacation days under a flexible benefits program.

ANSWER:

## 11. Continued

The 2021 year has ended and your contact at Zoomers has raised concerns about the claims adjudication process of the insurer. Your contact has asked you to do a claims audit. The following three certificates were randomly selected for the audit:

Certificate 1: Total amount reimbursed by Zoomers plan in 2021 - \$4,230

Name	Zoomers' status	Birthdate	Plan option	2021 eligible claims
Scott	Employee	July 4, 1985	Enhanced 1	Drugs: \$5,000
Emma	Spouse	June 18, 1986	Enhanced 2	Massage: \$300
Barb	Dependent	May 6, 2010	N/A	Vision: \$200

Certificate 2: Total amount reimbursed by Zoomers plan in 2021 - \$240

Name	Zoomers' status	Birthdate	Plan option	2021 eligible claims
Iris	Employee	March 20, 1987	Basic	Basic Dental: \$300 Major Dental: \$300
Andrew	Spouse	July 11, 1986	Basic	None

Certificate 3: Total amount reimbursed by Zoomers plan in 2021 - \$4,100

Name	Zoomers' status	Birthdate	Plan option	2021 eligible claims
Kevin	Employee and Spouse	June 18, 1985	Enhanced 2	Drugs: \$800
Tom	Employee and Spouse	April 5, 1990	Enhanced 2	Major Dental: \$3,000
Tania	Kevin Ex-Spouse	March 22, 1987	Enhanced 3	None
Karen	Child of Kevin and Tania but under Kevin's custody	May 18, 2012	N/A	Vision: \$400

- Non-employee spouses have primary coverage from their own employer, which also matches the plan design of Living Daylights with the addition of a \$500 HCSA
- (e) (2 points) Calculate the claim amount that should have been paid by Zoomers plan for each certificate. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 11. Continued

- (f) (1 point) Identify the certificate(s) that have had errors during the claim adjudication process by the insurer. Justify your answer.

ANSWER:

- (g) (1 point) Explain how integration of provincial plan benefits differs from coordination of benefits between group insurance plans.

ANSWER:

*The Excel spreadsheet has  
additional data and information applicable to this question.*

## **GH FVC Fall 2022 #6.**

*(11 points)* You are an actuarial benefits consultant. Your client, ABC, is a company operating in both Ontario and Quebec.

During the benefit review, ABC's benefit manager expressed his concerns regarding the rising benefits cost associated with its senior age employees. The benefits manager is proposing adding a clause to terminate benefit coverage at age 65 for their health and Long-Term Disability (LTD) plans.

(a) *(2 points)*

(i) Describe the Tribunal conclusions in Cassel's paper.

ANSWER:

(ii) Explain how the Tribunal decisions can be applied to ABC.

ANSWER:

Kevin is an employee of ABC working at the Quebec City office. Both Kevin and his wife, Ella, are currently covered under ABC's sponsored drug plan. Kevin is turning age 65 soon, and Ella is 2 years younger than Kevin.

(b) **LEARNING OBJECTIVE 4**

*(1 point)* Explain the drug coverage choices for both Kevin and Ella when Kevin will attain age 65.

ANSWER:

**6. Continued**

Kevin takes prescription drugs on the RAMQ formulary for a chronic condition with monthly costs totaling \$150. In addition, you are given the following information:

<b>RAMQ Plan</b>	
Deductible (per month)	\$22.25
Coinsurance assumed by the insured	35%
Maximum amount assumed by the insured (per month)	\$96.74
Premium per person (per year)	\$710

<b>ABC Drug Plan</b>	
Deductible	\$0
Coinsurance assumed by the insured	10%
Maximum amount assumed by the insured per year	\$1,000
Premium – Single (per month)	\$85
Premium – Family (per month)	\$187
Employee's contribution rate (% of premium)	50%

- (c) **LEARNING OBJECTIVE 3 AND 4**  
 (2 points) 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.

*The response for this part is to be provided in the Excel spreadsheet.*

## 6. Continued

Maria is an ABC employee working at the Toronto office. She is expecting a baby in 2023 and she is planning to take maternity leave starting from January 1, 2023.

- (d) LEARNING OBJECTIVE 4  
(2 points) Compare and contrast the maternity benefit under EI versus the Quebec Parental Insurance Plan (QPIP).

ANSWER:

You are given the following information for Maria and her husband Leo:

	Maria	Leo
Does the employer offer a Supplemental Unemployment Benefit (SUB) Plan ?	No	No
Has Maria / Leo worked more than 600 hours in the last 52 weeks ?	Yes	Yes
Has Maria / Leo collected any EI benefits in the past ?	No	No
Has Maria / Leo changed job in 2022 ?	No	Yes
Annual salary for current job	\$90,000	\$45,000

Assumptions:

- Maria will not be on disability after giving birth and her newborn baby is healthy
- In 2023, the maximum yearly insurable earnings are \$61,600
- At least one of Maria or Leo must always be off work during the first 52 weeks of the leave.

The Excel spreadsheet also provides the EI Program characteristics and 2022 weekly salary for both Maria and Leo.

- (e) LEARNING OBJECTIVE 4  
(4 points) 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.

*The response for this part is to be provided in the Excel spreadsheet.*

## **GH FVC Fall 2022 #9.**

(4 points) Meg's Eggs is a fast-growing free range egg company in Alberta with no group benefits offering. All employees of Meg's Eggs currently reside in Alberta, but Meghan, the CEO of Meg's Eggs, plans to expand operations into Quebec.

Meg's Eggs employees are requesting group benefits. Specifically, they have requested the following group benefits:

- Life insurance
- Long-term disability (LTD)
- Accidental death & dismemberment (AD&D)
- Medical

After discussing internally with her executive team, Meghan has decided to pay 100% of premiums for Meg's Eggs employees to have the requested benefits on a fully insured basis. Meghan would like to learn more about the taxation of group benefits.

(a) (2 points) Describe the tax implications in Alberta and Quebec for each benefit provided to the employee:

(i) on premiums paid by the employer

ANSWER:

(ii) on benefits received by the employee

ANSWER:

## 9. Continued

Meghan has retained the following quote with total gross annual premiums split by benefit and by province:

	Alberta employees	Quebec employees
Life	\$32,100	\$13,400
LTD	\$78,300	\$42,700
AD&D	\$7,200	\$3,200
Medical	\$40,800	\$28,300
Total	\$158,400	\$87,600

- (b) (1 point) 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.

*The response for this part is to be provided in the Excel spreadsheet.*

Meghan is also worried about being overcharged for LTD. She recently learned there are LTD plans offered under a self-insured basis.

- (c) (1 point) Explain to Meghan the advantages and disadvantages of a self-insured LTD plan.

ANSWER:

*Question 10 pertains to the Case Study.*

<https://www.soa.org/4ac731/globalassets/assets/files/edu/2022/spring/exams/fall-2022-exam-ghfvc-case-study.pdf>

*Each question should be answered independently.*

## **GH FVC Fall 2022 #10.**

(7 points) You are a consulting actuary at Skyfall. You are mediating merger discussions between Royale Health and Pinewood.

Pinewood is concerned that if the merger fails, the new combined company could become insolvent and the policyholders would be left without sufficient insurance.

- (a) (2 points) Describe how benefits provided by Pinewood will be protected by Assuris in case of insolvency.

ANSWER:

## 10. Continued

Prior to making their decision regarding the merger, Royale Health has requested additional financial information on Pinewood.

You are given the following additional information on the group life reserves held by Pinewood:

	December 31, Year 3 (\$000s)	December 31, Year 4 (\$000s)
Group paid-up insurance policies reserves	2,269	2,469
Unearned Premium Reserves (UPR) for group term policies	506	491
Unpaid claims reserves for group policies	1,518	1,472
Experience Rating Refund (ERR) reserves for group policies	245	506
Total Actuarial and Policy Liabilities	4,538	4,938

- The moving average interest rate on Government of Canada bonds is 3%
- There is no amount reported to policyholders and no life investment loss carryforward

~~(b) (2 points) Calculate Pinewood's life insurance investment income tax for Year 4. State any assumptions and show your work.~~

*The response for this part is to be provided in the Excel spreadsheet.*

## 10. Continued

The merger between Royale Health and Pinewood is now officially concluded. One month after the deal, Royale Health discovers Pinewood has misreported its life insurance investment income tax for Year 4 as \$9,157.

~~(c) — (1 point) Assess the consequences of this misreporting on the merger.~~

ANSWER:

The name of the new combined entity is Royale Pine. In their integration process, Royale Pine plans to use, for the Canadian market, the group insurance policy of Royale Health with some adjustments.

(d) (2 points) 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.

ANSWER:

*The Excel spreadsheet has  
additional data and information applicable to this question.*

## **GH VRC Spring 2023 #5.**

(7 points) You are a benefit consulting actuary at ABC. ABC is a company operating in both Ontario and Quebec. ABC has 125 employees in Ontario and 45 employees in Quebec. ABC started to offer a health benefit plan to all its employees beginning January 1, 2018. Its health plan has been fully insured by HealthierPlus Insurance Company since the beginning and the plan covers 100% of eligible drug costs with no deductions. As the current plan carries an EP3 certificate, the claims over the EP3 threshold are pooled.

In order to get the most competitive health plan rates, you recommended that ABC should go to market and request quotes from other insurers every five years. However, the CEO of ABC suspects ABC has some recurring high cost drug claims.

The CEO worries that other carriers will consider the full cost of claims and therefore, the price quoted will be much higher than the existing pricing, which limits his ability to shop the business.

- (a) (1 point) Critique the CEO's statements. Justify your answer.

ANSWER:

After having explained the Canadian life and health insurance industry pooling agreement to the CEO, he is interested to know how the agreement protects the EP3 and Industry Pool from anti-selection.

- (b) (1 point) Explain how the Canadian life and health insurance industry pooling agreement protects the EP3 and Industry Pool from anti-selection under the following two scenarios:

- (i) An Administrative Services Only (ASO) group with claims greater than the ongoing threshold in prior years wants to become fully-insured.

ANSWER:

- (ii) A plan sponsor wants to introduce drug coverage for its employees.

ANSWER:

**5. Continued**

(c) (1 point) Describe how the pooled drug claims cost is shared among participating insurers in the following pools:

(i) Canada Drug Insurance Pooling Corporation (CDIPC)

ANSWER:

(ii) LEARNING OBJECTIVE 4  
Quebec Drug Insurance Pooling Corporation (QDIPC)

ANSWER:

The Excel spreadsheet provides the following information:

- EP3 pooling thresholds (per certificate) from 2018 to 2022
- CDIPC pooling thresholds and maximum pooling level (per certificate) from 2018 to 2022
- QDIPC pooling thresholds and annual factors for 2022
- Historical drug claims for certificates that had at least one annual drug claim above the EP3 threshold

For all other certificates that did not have any claims above the EP3 threshold in the past, assume that the average annual claims cost is \$960 for 2022

(d) LEARNING OBJECTIVE 3 AND 4  
(4 points) Calculate the 2022 claims paid by the following:

(i) HealthierPlus Insurance Company

*The response for this part is to be provided in the Excel spreadsheet.*

(ii) QDIPC

*The response for this part is to be provided in the Excel spreadsheet.*

(iii) CDIPC

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

## **GH VRC Spring 2023 #6.**

(8 points) You are a consulting actuary supporting your client Company XYZ, an accounting firm that has offices in Ontario.

XYZ offers the following group benefits to its employees and retirees:

- Life
- Accidental Death & Dismemberment (AD&D)
- Extended Health
- Dental
- Short-term and long-term disability (provided to employees only)

As a result of the COVID-19 pandemic, all employees at Company XYZ now have an option of working remotely or in the office.

- (a) (2 points) Describe XYZ benefit plan considerations for employees working remotely outside of Ontario.

ANSWER:

Recently, one of Company XYZ's employees at its Toronto office contracted COVID-19. Despite the employee following the office's strict COVID-19 prevention protocols, it was identified through the provincial contact tracing program that the employee contracted the virus by sharing the elevator with a "superspreader". Unfortunately, the employee had pre-existing respiratory issues and passed away.

- (b) (2 points) Justify whether the situation described above would be considered an eligible AD&D claim by referencing any applicable court rulings.

ANSWER:

## 6. Continued

With travel restrictions lifted and COVID-19 testing no longer required for travel, more employees and retirees are taking vacation out-of-country. One of Company XYZ's retirees, John, recently went to Mexico and incurred a \$30,000 claim for a semi-private hospital stay.

John had the following out-of-country health coverage:

Policy type	Coverage level
Retiree group plan	Lifetime maximum: \$75,000 Claims to date: \$15,000
Spouse retiree group plan	Lifetime maximum: \$50,000 Claims to date: \$0
Individual plan	Per trip limit of \$1,000,000 Claims to date: \$0

- All plans have 100% coinsurance for a semi-private hospital room
- Assume that there is no reimbursement under the Government Health Insurance Plan
- The individual plan has a provision that stipulates that the plan will pay in excess of all other plans

When the claim occurred, John contacted his retiree group plan and provided the information of the retiree group plan to the hospital.

(c) (4 points) Pertaining to this specific situation:

(i) Explain how to determine the first carrier.

ANSWER:

(ii) Describe the responsibilities of the first carrier.

ANSWER:

(iii) Calculate the amount reimbursed by each plan. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

*The Excel spreadsheet has  
additional data and information applicable to this question.*

### **GH VRC Fall 2023 #4.**

*(11 points)* You are the group benefits consultant for ABC Company, based in Ontario, and have been negotiating the 20X1 group benefits renewal with their insurer. You successfully negotiated a no-change position to all premium rates for 20X1 and report the good news to the CFO.

You receive the following reply from the CFO:

*Thank you for securing this renewal for 20X1.*

*While the no-change position is great news, our plan remains exposed to many external risks which make next year's renewal difficult to predict. In particular, all the recent discussions over Canada Health Transfer payments have me concerned about further government offloading of costs to employers.*

*We are budgeting a 15% increase for 20X2, but in the event that more is required, we may have to enact contingency plans to remain market-competitive on employee salaries.*

*I would like to start with a worst-case scenario, in which we would eliminate the group benefits plan in its entirety in 20X2 and direct those funds towards employee salaries and applicable payroll taxes (CPP, EI, EHT). Every employee would receive the same raise on a percentage basis.*

*I have attached an Excel spreadsheet with all relevant information necessary.*

*While I am not seeking to cancel the group benefits plan, we must consider it. Besides, if any employee were to become disabled, at least the Canada Pension Plan (CPP) disability benefit is available to them.*

*Thank you again.*

#### 4. Continued

(a) (2 points)

- (i) LEARNING OBJECTIVE 4  
Critique the CFO's assertion concerning the CPP disability benefit.

ANSWER:

- (ii) Describe how the disabled employee's group benefits would be impacted if the plan were to terminate.

ANSWER:

(b) LEARNING OBJECTIVE 5  
(3 points) 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.

ANSWER:

- (ii) Describe the 2014 revisions to CHT payment calculations and what their expected impacts were.

ANSWER:

- (iii) List approaches available to governments to safeguard the sustainability of Canada's health care system.

ANSWER:

#### 4. Continued

(c) (5 points) Calculate the following:

(i) The budgeted group benefits plan costs for 20X2.

*The response for this part is to be provided in the Excel spreadsheet.*

(ii) The raise in employee salaries that the result in (i) would fund.

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

(d) (1 point) Recommend whether ABC Company should eliminate its group benefits plan in exchange for higher employee salaries. Justify your response.

ANSWER:

## **GH VRC Fall 2023 #6.**

(6 points) You are an actuary working for New Life Insurance (New Life), a Canadian group insurance company.

One of New Life's large clients, Great Product, has a new Chief Human Resources Officer (CHRO) and has reached out to you with a number of questions with respect to its fully-insured group benefits plan.

The CHRO has noticed that some important information is missing when New Life issues booklets to Great Product employees.

- (a) (2 points) List the elements that a booklet should contain according to Guideline G3 from the CLHIA.

ANSWER:

The CHRO has learned that Great Product is considering self-insuring its Long Term Disability (LTD) plan.

- (b) (1 point) List the advantages and disadvantages of a self-insured LTD plan.

ANSWER:

**6. Continued**

Great Product pays 90% of the cost of the group benefits plan, and the CHRO would like to learn more about the taxation of its fully insured group benefits for its employees.

(c) (2 points)

(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				

ANSWER:

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

ANSWER:

## 6. Continued

The CHRO has health and dental care coverage under the Great Product plan and their spouse's group plan.

You are given the following information:

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

- The CHRO's first claim is for \$1,000
- (d) *(1 point)* Calculate the total amount paid by each plan. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## GH VRC Spring 2024 #6.

(10 points) You are the group pricing actuary at ABC Insurance Company. You are responsible for the reporting of industry pooling programs and for establishing EP3 pooling mechanisms for ABC.

You are given the latest information on internal and industry pooling mechanisms:

<b>EP3 Thresholds (per certificate)</b>			
	<b>20X1</b>	<b>20X2</b>	<b>20X3</b>
EP3 Pooling Threshold	\$10,000	\$10,000	\$10,000

<b>Canadian Drug Insurance Pooling Corporation (CDIPC)</b>			
	<b>20X1</b>	<b>20X2</b>	<b>20X3</b>
Initial Threshold	\$65,000	\$65,000	\$65,000
Ongoing Threshold	\$32,500	\$32,500	\$32,500
Coinsurance (amount pooled)	85%	85%	85%
Maximum Pooled Amount	\$500,000	\$500,000	\$500,000

<b>Quebec Drug Insurance Pooling Corporation (QDIPC) – 20X3</b>			
<b>Size of Group (number of certificates)</b>	<b>Pooling threshold</b>	<b>Annual factor - Without dependants</b>	<b>Annual factor - With dependants</b>
Fewer than 25	\$10,000	\$276	\$771
Between 25 and 49	\$18,000	\$188	\$527
Between 50 and 124	\$32,500	\$100	\$339
Between 125 and 249	\$55,000	\$66	\$224
Between 250 and 499	\$80,000	\$50	\$169
Between 500 and 999	\$105,000	\$36	\$142
Between 1,000 and 3,999	\$130,000	\$31	\$123
Between 4,000 and 5,999	\$300,000	\$15	\$60
6,000 and over	n/a	n/a	n/a

- (a) **LEARNING OBJECTIVE 4**  
(1 point) Describe the three different forms of pooling in group insurance.

ANSWER:
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**6. Continued**

(b) (2 points) Describe the rationale for the creation of the following industry pooling programs:

(i) LEARNING OBJECTIVE 4  
QDIPC

ANSWER:

(ii) CDIPC

ANSWER:

(c) LEARNING OBJECTIVE 3 AND 4  
(3 points) Summarize QDIPC and CDIPC with respect to:

(i) Participation of insurers

ANSWER:

(ii) Covered plans

ANSWER:

(iii) Pooling thresholds

ANSWER:

(iv) Sharing of pooled claims among participating insurers

ANSWER:

(v) Pricing of groups within a participating insurer

ANSWER:

## 6. Continued

You are given the following drug claim amounts for XYZ, a small client of ABC, having 6 employees all located in Nova Scotia:

Certificate	Member	20X1	20X2	20X3
1	Employee	\$22,000	\$25,000	\$19,000
2	Spouse	\$35,000	\$750	\$1,000
3	Employee	\$15,000	\$12,000	\$14,000
3	Spouse	\$15,000	\$20,000	\$25,000
4	Employee	\$550,000	\$575,000	\$600,000
5	Employee	\$9,000	\$10,000	\$8,000
5	Spouse	\$60,000	\$75,000	\$80,000
5	Child	\$400	\$200	\$500
6	Employee	\$125,000	\$130,000	\$0

(d) LEARNING OBJECTIVE 3 AND 4

(2 points) Calculate the claim amounts for 20X3 assumed by:

- (i) Industry pooling mechanisms

*The response for this part is to be provided in the Excel spreadsheet.*

- (ii) XYZ

*The response for this part is to be provided in the Excel spreadsheet.*

- (iii) ABC

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

(e) LEARNING OBJECTIVE 3 AND 4

(1 point) Calculate the claim amounts in (d) assuming that this group's employees were located in Quebec. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

(f) LEARNING OBJECTIVE 3 AND 4

(1 point) Propose a change to the CDIPC pooling program that will help to further preserve the viability and affordability of employers' drug programs. Justify your answer.

ANSWER:

## **GH VRC Spring 2024 #7.**

*(5 points)*

(f) *(2 points)*

(i) Describe the purpose and structure of Assuris.

ANSWER:

(ii) Describe the funding of Assuris.

ANSWER:

(g) *(1 point)* Describe the benefit guarantee provided by Assuris for the following benefits:

(i) Group Life

ANSWER:

(ii) Group Disability

ANSWER:

(iii) Group Supplemental Health Expense

ANSWER:

(iv) Group Critical Illness

ANSWER:

## 7. Continued

You are given the following information on two group insurance members:

Member	Death Benefit	Monthly Disability Income Benefit	Health Claim Allowed Amount
1	\$300,000	N/A	\$125,000
2	N/A	\$1,800	\$70,000

- The health benefit plan has 70% coinsurance with no deductible and no annual maximum.

(h) (1 point) Calculate the Assuris guaranteed amount for each member. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

The insurance company that covers the two members filed for bankruptcy and appointed a liquidator to sell the assets and transfer the liabilities with the aim of getting the best value for policyholders.

The liquidator sold the block at a value that will allow the insured members to recover 90% of the value of their insured benefits.

(i) (1 point) Calculate the additional amount each member will receive above the Assuris guaranteed amount calculated in (c). State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## **GH VRC Spring 2024 #9.**

(7 points) Company ABC offers employees a comprehensive group benefits package including life insurance, disability (short-term and long-term), medical coverage including prescription drugs, dental coverage, and out-of-province emergency coverage.

Prior to the COVID-19 pandemic, all employees resided in British Columbia (BC) and physically reported to Company ABC's office in Vancouver. As remote work took hold during COVID-19, two employees left the province as noted below:

Employee 1	Moved to Quebec on January 1, 20X1
Employee 2	Moved to Ontario on January 1, 20X1

- (a) (1 point) Describe concerns with respect to Company ABC's group benefits for these two employees.

ANSWER:

- (b) **LEARNING OBJECTIVE 4**  
(2 points) Compare and contrast eligibility requirements for government health insurance plans (GHIPs) in BC, Quebec and Ontario.

ANSWER:

## 9. Continued

In February 20X1, two employees experience the claims outlined in the table below:

Employee	Service	Description
1	Physician	Experiences stomach pains and visits a physician who advises rest.
1	Emergency surgery	The pain worsens and an emergency surgery is required.
2	Out-of-province	Travels to the United States and has a minor accident resulting in a broken arm. Individual travel coverage was purchased prior to the trip and this provider is contacted first.

- (c) **LEARNING OBJECTIVE 3 AND 4**  
(4 points) Describe how the costs of the services in the table above would be coordinated between:

- Each employee
- The Company ABC group benefits plan
- Other private coverage
- GHIPs

State any assumptions made.

ANSWER:
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## GH VRC Fall 2024 #5.

(10 points) The benefits department of Company XYZ, a Quebec-based employer, is aware of a brand name maintenance drug whose patent is set to expire next year. At least one generic drug is anticipated to be available once the patent expires.

(a) LEARNING OBJECTIVE 4

(1 point) Describe how prices are set for brand name and generic drugs in Canada.

ANSWER:

XYZ has contacted you, a benefits consultant, to help determine its projected savings due to the patent expiry.

In the Excel spreadsheet, you are provided with the following:

- Pricing information regarding the brand name drug
- The current distribution of XYZ employees taking the brand name drug
- Other assumptions

(b) LEARNING OBJECTIVE 3 AND 4

(1 point) Calculate XYZ's current year costs. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

(c) LEARNING OBJECTIVE 3 AND 4

(6 points) Calculate XYZ's projected costs next year if:

- (i) A physician prescribes the generic drug
- (ii) A physician prescribes the brand name drug and indicates "no substitution"

State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

(d) LEARNING OBJECTIVE 4

(2 points) Recommend four changes to the plan design that XYZ can consider to reduce plan costs. Justify your answer.

ANSWER:

## GH VRC Fall 2024 #7.

(10 points) Company ABC offers its employees a group benefits plan through an Employee Life and Health Trust (ELHT). The plan includes Basic Life, Long Term Disability, Salary Continuance, Health and Dental coverages.

Prior to January 1, 2021, these benefits were provided through a Health and Welfare Trust (HWT). On January 1, 2021, the HWT was converted to an ELHT.

- (a) (2 points) Explain how an ELHT is more tax efficient than a HWT.

ANSWER:

- (b) (2 points) Compare and contrast other characteristics of a HWT and ELHT.

ANSWER:

Upon a recent internal audit, it was discovered that ABC:

- Did not adjust their Trust Income Tax and Information Returns for 2021 to 2023 following the conversion
- Under-reported benefits paid to beneficiaries in the amounts of:

2021	\$500,000
2022	\$400,000
2023	\$450,000

ABC's tax rate is 30%.

In the Excel spreadsheet, you are provided with the tax returns filed for years 2021 to 2023.

- (c) (4 points) Revise ABC's tax returns for 2021 to 2023 reflecting the results of the internal audit. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 7. Continued

Due to benefit cost increases in recent years, ABC will reduce plan costs by 60% in 2024 in exchange for a Health Care Spending Account (HCSA).

In the Excel spreadsheet, you are given assumptions and projections for 2024.

- (d) (2 points) Construct the projected tax return for 2024. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

# **Exam GH 201-C**

## **Learning Objective 4**

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## **GH FVCC Fall 2020 #4.**

(12 points) You are the consulting actuary at Skyfall for Another Day.

The newly hired Benefits Manager at Another Day has contacted you in order to obtain information on various social programs.

(a) (2 points) List the eligibility criteria for:

(i) Old Age Security (OAS)

ANSWER:

(ii) Guaranteed Income Supplement (GIS)

ANSWER:

(b) (3 points) Describe the general provisions included in Canadian/Quebec Pension Program (C/QPP).

ANSWER:

The Benefits Manager at Another Day would be interested to learn more about the Employment Insurance (EI) Premium Reduction Program.

(c) (1 point) List the acceptable arrangements for returning 5/12 of the premium reduction to employees.

ANSWER:

(d) (2 points) Define the minimum requirements to qualify for the EI premium reduction.

ANSWER:

#### 4. Continued

Another Day recently introduced a Compassionate Care Benefits (CCB) plan with the following characteristics:

- Benefit amount is 75% of weekly salary up to \$1,000
- 26 week benefit period
- 3 days elimination period
- Second payer to any EI special benefits

You are given the following information on two participants at Another Day:

	John	Diana
Age at July 1, 2020	35	63
Annual salary at Current Age	35,000	80,000

- (e) (2 points) Calculate the weekly CCB amounts for John and Diana under:
- (i) EI program
  - (ii) Employer plan

State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (f) (2 points) Evaluate whether or not the short-term disability (STD) plan and the CCB plan of Another Day qualify under the EI premium reduction program. Justify your answer.

ANSWER:

## GH FVCC Spring 2021 #2.

(6 points) John lives in Ontario and works for company ABC, a company with offices around North America.

You are provided with the following information about John:

- Marital Status: Single
- Age: 64 years old
- Net Annual Income: \$60,000
- John is covered under ABC's extended healthcare plan, which is 100% paid by ABC
- John is covered under the Trillium Drug Program (TDP), the annual deductible is 4% of net income
- John's eligible drug claims under both ABC's plan and the TDP for the period August 1, 2019 to July 31, 2020 are as follows:

	Generic Drugs	Brand-Name Drugs	Patented Drugs
Number of prescriptions per month	3	2	1
Cost per prescription	\$50	\$500	\$8,850

ABC's extended healthcare plan has the following prescription drug coverage:

- Plan year is from August 1<sup>st</sup> to July 31<sup>st</sup>
- No annual deductible
- Reimbursement: 100%
- Benefit maximum: \$20,000 per plan year
- No mandatory generic substitution

(a) (3 points) Calculate the following:

- (i) Cost covered under ABC's extended healthcare plan
- (ii) Costs covered by TDP
- (iii) John's out-of-pocket cost

State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 2. Continued

- (b) (1 point) List the strategies outlined in the pan-Canadian Pharmaceutical Alliance Initiative.

ANSWER:

- (c) (1 point) Identify ways John's drug utilization and costs under the ABC plan can be managed.

ANSWER:

Further to the recent changes in cannabis legislation in Canada, ABC is aware that some employees want coverage for medical cannabis to be added under the company's extended health benefit.

- ~~(d) (1 point) List ABC's considerations around adding medical cannabis coverage to their benefits plan.~~

~~ANSWER:~~

## GH FVCC Spring 2021 #4.

(8 points) Several years ago, partners Sally and Sam created a very successful embroidery company in Ottawa called Sally & Sam Inc. They have a large sales workforce of 500 employees with the following characteristics:

- All employees are single with no dependents
- All employees are in the age ranges of 25 to 30
- All employees are paid \$20,000 annually
- No drug claims for 2020

- (a) (1 point) Describe the various funding mechanisms for the Ontario Health Insurance Plan (OHIP).

ANSWER:

You are given the following information on the two partners:

<b>Year 2020</b>	<b>Sally</b>	<b>Sam</b>
Employee Age	66	60
Salary	\$350,000	\$230,000
Drug Claims	\$100	\$900
Spouse Name	N/A	Penelope
Spouse Employment		Unemployed
Spouse Age		48
Drug Claims		\$1,000
Child's Name		Kevin
Child's Age		19
Drug Claims	N/A	\$20,000
Child's Name		Charlotte
Child's Age		17
Drug Claims	N/A	\$50

- (b) (2 points) Calculate the funding OHIP would receive from Sally & Sam Inc. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

#### 4. Continued

To further add to their compensation package, Sally & Sam Inc. would like to offer a prescription drug plan to its employees.

You are given the following assumptions:

- Trend rate is 5% per year
- Coinsurance is 10%
- Claims include administrative fees, but exclude provincial sales and premium taxes
- 85% of every person's drug costs are eligible under the Ontario Drug Benefit
- All eligible people will be covered under the plan

- (c) (2 points) Calculate the average out of pocket cost per covered person in 2021 for the proposed prescription drug benefit plan. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (d) (2 points) Recommend whether Sam's family would be better off having family coverage, couple coverage or single coverage. Justify your answer.

*The response for this part is to be provided in the Excel spreadsheet.*

- (e) (1 point) Explain whether or not Sam's family would have to pay for Kevin's medication under the following independent scenarios:

- Sam's family recently reached their annual family plan maximum with their private health services plan.
- Kevin's medication was removed from the prescription drug formulary of their private health services plan.

Justify your answer.

ANSWER:

## **GH FVCC Fall 2021 #1.**

(8 points) Blades of Steel is a steel manufacturer in Ontario specializing in the production of steel products. The CEO of Blades of Steel is concerned about the rising costs associated with workers compensation.

- (a) (1 point) Describe employee groups who are covered for workers compensation benefits in Canada.

ANSWER:

- (b) (1 point) Describe how workers compensation benefits are funded in Canada.

ANSWER:

- (c) (2 points) List and describe the benefits provided by workers compensation coverage in Canada.

ANSWER:

# 1. Continued

You have been provided with the following reported health claims as of January 2021:

	<b>Alvin</b>	<b>Jennifer</b>	<b>Theodore</b>
Employee Age	40	50	60
Monthly Income	\$6,000	\$6,500	\$7,500
Family Status	Single	Married with 2 dependent children	Married with no children
Nature of Claim	Steel beam fell on leg at the plant	Fell off ladder while painting house	Severely burnt hands while forging steel at the plant
Prognosis	Off work for 1 month	Off work for 2 months	Cannot work again
Monthly healthcare claims related to prognosis	\$100	\$2,000	\$500

Additional information is provided:

- Interest rate is 3% per year
- Healthcare claims increase each month and trend at a rate of 5% per year
- Assume COLA of 2% per year (applied at end of year)
- Any workers compensation income replacement is payable at 85% of gross earnings
- Assume all costs are paid at month-end
- Job rehabilitation programs cost is \$150 per employee per month (paid at end of month)
- Benefits are paid out until age 65

- (d) (3 points) Calculate the present value of workers compensation benefits for each of the listed employees above. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (e) (1 point) Propose incentives to encourage Blades of Steel to better manage the cost of workplace accidents. Justify your answer.

ANSWER:

**Question 6 pertains to the Case Study**

<https://www.soa.org/4ae4cd/globalassets/assets/files/edu/2021/fall/exams/fall-2021-exam-ghfvcc-case-study.pdf>

**GH FVCC Fall 2021 #6.**

(6 points) ABC is a company located in British Columbia (BC) and offers a supplemental medical plan for its employees on a self-insured basis. Its plan is administered by Living Daylights.

During the benefit review with Living Daylights, the CEO of ABC expressed his concern regarding ABC's significantly higher brand drug utilization relative to its peer companies.

- (a) (1 point) List and describe the three recommendations of the Canadian Life and Health Insurance Association (CLHIA) to ensure affordable prescription drugs in Canada.

ANSWER:

You are given the following information for ABC for 2020:

<b>Annual Salary</b>	<b>Number of employees</b>
\$40,000	50
\$50,000	30
\$60,000	40
\$70,000	20
\$80,000	10
\$90,000	10

- ABC's employees and their salaries will not change in 2021
- The average plan cost, including all taxes and fees, for 2020 is \$92 per employee per month and is 100% paid by ABC
- The group benefits budget for 2021 is the same as in 2020

## 6. Continued

You are also given the following information:

Annual BC Payroll	Employer Health Tax Rate	Maximum Annual Tax
Up to \$500,000	0.00%	\$0.00
\$500,000 - \$750,000	0.98%	\$7,313
\$750,001 - \$1,000,000	1.46%	\$14,625
\$1,000,001 - \$1,250,000	1.76%	\$21,938
\$1,250,001 - \$1,500,000	1.95%	\$29,250
Over \$1,500,000	1.95%	\$29,250 + 1.95% of payroll over \$1,500,000

Assessable earning maximum for BC Workplace Safety & Insurance Board (WSIB)	\$100,000
Year's Maximum Pensionable Earnings	\$61,600
Employment Insurance Maximum Yearly Insurable Earnings	\$56,300
Canada Pension Plan employer rate	5.45%
Employment Insurance employer rate	2.21%
BC WSIB assessment rate	1.55%

The CEO is considering providing a salary increase in 2021 instead of offering the supplemental medical plan.

- (b) (3 points) Calculate the 2021 salary increase that would be cost neutral for ABC. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (c) LEARNING OBJECTIVE 3  
(1 point) Assess the impact of the proposed change for employees. Justify your answer.

ANSWER:

**6. Continued**

Instead of eliminating its supplemental medical plan entirely, Living Daylights is considering implementing changes to its drug plan.

- (d) *(1 point)* Recommend cost saving options to address the CEO's concern regarding ABC's higher brand drug utilization relative to its peer companies. Justify your answer.

ANSWER:
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## **GH FVC Spring 2022 #6.**

*(11 points)* As a consulting actuary, your client, Company XYZ, has asked you to review its current sick leave program. Your client currently has a program that provides 18 sick days per year that can accumulate to a maximum bank of 50 days.

Company XYZ is interested in learning more about government sickness benefits.

- (a) *(2 points)* Describe the eligibility requirements for Employment Insurance (EI) sickness and Canada Pension Plan (CPP) disability benefits.

ANSWER:

- (b) *(1 point)* Describe how employer-provided short-term and long-term disability plans interact with government programs.

ANSWER:

## 6. Continued

You are given the following information for 2021:

- Current Year's Maximum Pensionable Earnings (YMPE): \$61,600
- CPP disability flat monthly amount: \$511
- CPP disability monthly maximum: \$1,414
- Expected consumer price index (CPI) increase: 0%

You are also given the following information for one of Company XYZ's employees, Debbie:

- Pre-disability salary: \$52,000
- Average monthly pensionable CPP earnings: \$2,333
- Current age: 32
- Sick leave bank: 5 days
- Date of disability: January 1, 2021
- Debbie is approved for disability benefits until December 31, 2022

- (c) (2 points) Calculate the total benefit paid from EI and CPP. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 6. Continued

Company XYZ wants to ensure that its group benefits program is aligned with its inclusion and diversity philosophy. In particular, Company XYZ would like to review benefits relating to maternity and parental leave.

Company XYZ has proposed the following supplemental plan to top up maternity and parental benefits:

- Top up benefits to 90% of pre-leave earnings will be provided during the first 8 weeks of receiving EI maternity or parental benefits
- Benefits of 90% of pre-leave earnings will also be provided during the EI waiting period
- The top up amount paid will reduce any sick bank amounts up to the current balance

- (d) (2 points) Compare and contrast EI maternity and parental benefits.

ANSWER:

- (e) (2 points) Critique the client's supplemental plan design.

ANSWER:

Another employee, Margaret, plans to take time off work for 26 weeks after giving birth and will go on maternity and parental leave during this time.

- (f) (2 points) Calculate the total amount Margaret will receive from her employer supplemental plan and from EI during her time off work. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

*The Excel spreadsheet has  
additional data and information applicable to this question.*

## **GH FVC Fall 2022 #6.**

*(11 points)* You are an actuarial benefits consultant. Your client, ABC, is a company operating in both Ontario and Quebec.

During the benefit review, ABC's benefit manager expressed his concerns regarding the rising benefits cost associated with its senior age employees. The benefits manager is proposing adding a clause to terminate benefit coverage at age 65 for their health and Long-Term Disability (LTD) plans.

(a) LEARNING OBJECTIVE 3

*(2 points)*

(i) Describe the Tribunal conclusions in Cassel's paper.

ANSWER:

(ii) Explain how the Tribunal decisions can be applied to ABC.

ANSWER:

Kevin is an employee of ABC working at the Quebec City office. Both Kevin and his wife, Ella, are currently covered under ABC's sponsored drug plan. Kevin is turning age 65 soon, and Ella is 2 years younger than Kevin.

(b) *(1 point)* Explain the drug coverage choices for both Kevin and Ella when Kevin will attain age 65.

ANSWER:

**6. Continued**

Kevin takes prescription drugs on the RAMQ formulary for a chronic condition with monthly costs totaling \$150. In addition, you are given the following information:

<b>RAMQ Plan</b>	
Deductible (per month)	\$22.25
Coinsurance assumed by the insured	35%
Maximum amount assumed by the insured (per month)	\$96.74
Premium per person (per year)	\$710

<b>ABC Drug Plan</b>	
Deductible	\$0
Coinsurance assumed by the insured	10%
Maximum amount assumed by the insured per year	\$1,000
Premium – Single (per month)	\$85
Premium – Family (per month)	\$187
Employee's contribution rate (% of premium)	50%

- (c) **LEARNING OBJECTIVE 3 AND 4**  
(2 points) 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.

*The response for this part is to be provided in the Excel spreadsheet.*

## 6. Continued

Maria is an ABC employee working at the Toronto office. She is expecting a baby in 2023 and she is planning to take maternity leave starting from January 1, 2023.

- (d) (2 points) Compare and contrast the maternity benefit under EI versus the Quebec Parental Insurance Plan (QPIP).

ANSWER:

You are given the following information for Maria and her husband Leo:

	Maria	Leo
Does the employer offer a Supplemental Unemployment Benefit (SUB) Plan ?	No	No
Has Maria / Leo worked more than 600 hours in the last 52 weeks ?	Yes	Yes
Has Maria / Leo collected any EI benefits in the past ?	No	No
Has Maria / Leo changed job in 2022 ?	No	Yes
Annual salary for current job	\$90,000	\$45,000

Assumptions:

- Maria will not be on disability after giving birth and her newborn baby is healthy
- In 2023, the maximum yearly insurable earnings are \$61,600
- At least one of Maria or Leo must always be off work during the first 52 weeks of the leave.

The Excel spreadsheet also provides the EI Program characteristics and 2022 weekly salary for both Maria and Leo.

- (e) (4 points) 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.

*The response for this part is to be provided in the Excel spreadsheet.*

**Question 11 pertains to the Case Study.**

<https://www.soa.org/4ac731/globalassets/assets/files/edu/2022/spring/exams/fall-2022-exam-ghfvc-case-study.pdf>

**Each question should be answered independently.**

*The Excel spreadsheet has*

*additional data and information applicable to this question.*

## **GH FVC Fall 2022 #11.**

(8 points) You are a consulting actuary. Your client, Another Day, has asked you to review its benefit and retirement programs. Another Day is interested in learning more about government programs and how private insurance plans work within the framework of social programs in Canada.

- (a) (1 point) List and describe the types of benefits provided by the Canada and Quebec Pension Plans (CPP/QPP).

ANSWER:

In 2016, the Canadian Federal and Provincial Finance Ministers agreed to expand the Canadian Pension Plan (CPP) between years 2019 and 2025.

- (b) (1 point) List the key developments as a result of this agreement.

ANSWER:

## 11. Continued

-  
You are provided with the following information on historical CPP contributions:

<b>Year</b>	<b>Year's Basic Exemption (YBE)</b>	<b>Year's Maximum Pensionable Earnings (YMPE)</b>	<b>Overall Contribution Rate to CPP</b>
2016	\$3,500	\$54,900	9.90%
2017	\$3,500	\$55,300	9.90%
2018	\$3,500	\$55,900	9.90%
2019	\$3,500	\$57,400	10.20%
2020	\$3,500	\$58,700	10.50%
2021	\$3,500	\$61,600	10.90%
2022	\$3,500	\$64,900	11.40%

Assumptions:

- No annual change in Another Day employee demographics and salaries
- No employees in Quebec
- The YMPE will be increased by 5% annually starting from 2022 and thereafter

- (c) (3 points) 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.

*The response for this part is to be provided in the Excel spreadsheet.*

## 11. Continued

You are given the following information on Ella and John, two employees of Another Day, who applied for CPP disability benefits:

	<b>Ella</b>	<b>John</b>
<b>Hire date</b>	February 1 <sup>st</sup> , 2020	February 1 <sup>st</sup> , 2020
<b>Disability date</b>	July 1 <sup>st</sup> , 2022	July 1 <sup>st</sup> , 2022
<b>Family Status</b>	Single	Single
<b>CPP application status</b>	Rejected	Approved

- Ella was not employed and did not have any CPP contributions prior to joining Another Day
- John was employed by another company prior to joining Another Day

The Excel spreadsheet provides the historical salaries for John and Ella.

The maximum CPP disability benefit for 2022 is the following:

	<b>Flat amount</b>	<b>Maximum Earnings-related portion</b>	<b>Maximum Total</b>
<b>Maximum CPP disability benefit</b>	\$524.64	\$940.19	\$1,464.83

- (d) (2 points) Calculate the monthly CPP disability benefits payable to John. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

- (e) (1 point) Explain two possible reasons for Ella's rejection for CPP disability benefits. Justify your answer.

ANSWER:

*The Excel spreadsheet has  
additional data and information applicable to this question.*

## **GH VRC Spring 2023 #2.**

*(11 points)* You are a benefit consultant at Gas Plus. Gas Plus is a natural gas trading company headquartered in Toronto with employees and locations across Canada. Gas Plus offers extended health and long-term disability plans to all its employees. Gas Plus pays 100% of the premium and its benefits plans are fully insured by ABC Insurance.

- (a) *(1 point)* Compare and contrast how the provincial health insurance plans are financed in Ontario and in British Columbia (BC).

ANSWER:

- (b) *(1 point)* List and describe the main updates contained in the 2018 Joint Statement of the pan-Canadian Pharmaceutical Alliance (pCPA) and the Canadian Generic Pharmaceutical Association (CGPA).

ANSWER:

One of ABC's cost control methods is to make sure plan members apply for government assistance where possible. You have been provided with three different cases related to specific employees.

## 2. Continued

**Case #1** – The Excel spreadsheet provides information on Nancy, an employee of the Toronto office:

(c) (3 points)

- (i) Assess if Nancy’s family is eligible for reimbursement under any of the public plans in Ontario. Justify your answer.

*The response for this part is to be provided in the Excel spreadsheet.*

- (ii) Calculate the claim amounts paid by ABC, the Ontario public plans and Nancy’s family from August 2022 to July 2023. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

**Case #2** – The Excel spreadsheet provides information on John, a single employee of the Vancouver office:

- (d) (3 points) Calculate the difference in paid amount in 2023 by BC Pharmacare, ABC and John if John uses Remicade or Inflectra for all of 2023. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

**Case #3** – The Excel spreadsheet provides information on Kevin, a disabled employee of the Calgary office:

(e) (3 points)

- (i) Describe the qualifying conditions for CPP disability benefits.

*The response for this part is to be provided in the Excel spreadsheet.*

- (ii) Calculate the net monthly disability benefit that Kevin will receive from ABC if he is approved for CPP. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

*The Excel spreadsheet has  
additional data and information applicable to this question.*

### **GH VRC Spring 2023 #5.**

*(7 points)* You are a benefit consulting actuary at ABC. ABC is a company operating in both Ontario and Quebec. ABC has 125 employees in Ontario and 45 employees in Quebec. ABC started to offer a health benefit plan to all its employees beginning January 1, 2018. Its health plan has been fully insured by HealthierPlus Insurance Company since the beginning and the plan covers 100% of eligible drug costs with no deductions. As the current plan carries an EP3 certificate, the claims over the EP3 threshold are pooled.

In order to get the most competitive health plan rates, you recommended that ABC should go to market and request quotes from other insurers every five years. However, the CEO of ABC suspects ABC has some recurring high cost drug claims.

The CEO worries that other carriers will consider the full cost of claims and therefore, the price quoted will be much higher than the existing pricing, which limits his ability to shop the business.

**(a) LEARNING OBJECTIVE 3**

*(1 point)* Critique the CEO's statements. Justify your answer.

ANSWER:

After having explained the Canadian life and health insurance industry pooling agreement to the CEO, he is interested to know how the agreement protects the EP3 and Industry Pool from anti-selection.

**(b) LEARNING OBJECTIVE 3**

*(1 point)* Explain how the Canadian life and health insurance industry pooling agreement protects the EP3 and Industry Pool from anti-selection under the following two scenarios:

- (i) An Administrative Services Only (ASO) group with claims greater than the ongoing threshold in prior years wants to become fully-insured.

ANSWER:

- (ii) A plan sponsor wants to introduce drug coverage for its employees.

ANSWER:

## 5. Continued

(c) (1 point) Describe how the pooled drug claims cost is shared among participating insurers in the following pools:

- (i) LEARNING OBJECTIVE 3  
Canada Drug Insurance Pooling Corporation (CDIPC)

ANSWER:

- (ii) Quebec Drug Insurance Pooling Corporation (QDIPC)

ANSWER:

The Excel spreadsheet provides the following information:

- EP3 pooling thresholds (per certificate) from 2018 to 2022
- CDIPC pooling thresholds and maximum pooling level (per certificate) from 2018 to 2022
- QDIPC pooling thresholds and annual factors for 2022
- Historical drug claims for certificates that had at least one annual drug claim above the EP3 threshold

For all other certificates that did not have any claims above the EP3 threshold in the past, assume that the average annual claims cost is \$960 for 2022

(d) LEARNING OBJECTIVE 3 AND 4  
(4 points) Calculate the 2022 claims paid by the following:

- (i) HealthierPlus Insurance Company

*The response for this part is to be provided in the Excel spreadsheet.*

- (ii) QDIPC

*The response for this part is to be provided in the Excel spreadsheet.*

- (iii) CDIPC

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

## GH VRC Fall 2023 #2.

(9 points) Company ABC's employee benefits program is being reviewed by management after experiencing sustained rising costs in recent years, largely due to biologic drug utilization and significant dental fee guide increases.

The CFO of the company has contacted you to discuss the federal government's role with respect to prescription drug pricing and the recently implemented national dental-care plan.

(a) (2 points)

- (i) Describe the mandate of the Patented Medicines Prices Review Board (PMPRB).

ANSWER:

- (ii) List challenges faced by the PMPRB.

ANSWER:

- (b) (1 point) List and describe the proposed changes to the Patented Medicines Regulations to protect Canadians from excessive prescription drug prices.

ANSWER:

- ~~(c) (2 points) Summarize the challenges faced by the federal government in implementing its national dental-care plan.~~

ANSWER:

## 2. Continued

The review has been completed and Company ABC is considering the following changes:

- Participating in the insurer's biosimilar program, in which existing patients on biologics would be required to switch to the biosimilar or remain on the biologic and pay the difference in cost
- Eliminating the employer dental program in its entirety to allow employees to apply for the national dental-care plan

The CFO is aware of an employee who would be impacted by the switch to the biosimilar program and is considering providing a one-time cash payment that will allow the employee to remain on the biologic until retirement.

You are provided with the following:

- The employee is age 60 and is assumed to retire at 65
- Other information:

Monthly cost of biologic	\$2,500, increasing at 7.00% annually
Monthly cost of biosimilar	\$1,875, increasing at 6.00% annually
Treatment schedule	One injection on the 1 <sup>st</sup> of every month
Annual interest rate	4.00%
Employee salary	\$100,000
Marginal income tax rate	35.00%

- (d) (2 points) 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.

*The response for this part is to be provided in the Excel spreadsheet.*

The CFO indicates that the company can commit to 60% of the one-time cash payment you calculated. You approach the manufacturer of the biologic to negotiate an annual rebate for the remainder.

You are provided with the following information:

- Rebates are payable annually on the last day of the year
  - Rebates are not taxable
  - Rebates are equal in dollar amounts every year
- (e) (1 point) Calculate the minimum annual rebate you need to negotiate. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## 2. Continued

(f) (1 point) Recommend whether Company ABC should implement either of the below changes. Justify your answers.

(i) Participating in the insurer's biosimilar program

ANSWER:

(ii) ~~Eliminating the employer dental program~~

ANSWER:

*The Excel spreadsheet has  
additional data and information applicable to this question.*

### **GH VRC Fall 2023 #4.**

*(11 points)* You are the group benefits consultant for ABC Company, based in Ontario, and have been negotiating the 20X1 group benefits renewal with their insurer. You successfully negotiated a no-change position to all premium rates for 20X1 and report the good news to the CFO.

You receive the following reply from the CFO:

*Thank you for securing this renewal for 20X1.*

*While the no-change position is great news, our plan remains exposed to many external risks which make next year's renewal difficult to predict. In particular, all the recent discussions over Canada Health Transfer payments have me concerned about further government offloading of costs to employers.*

*We are budgeting a 15% increase for 20X2, but in the event that more is required, we may have to enact contingency plans to remain market-competitive on employee salaries.*

*I would like to start with a worst-case scenario, in which we would eliminate the group benefits plan in its entirety in 20X2 and direct those funds towards employee salaries and applicable payroll taxes (CPP, EI, EHT). Every employee would receive the same raise on a percentage basis.*

*I have attached an Excel spreadsheet with all relevant information necessary.*

*While I am not seeking to cancel the group benefits plan, we must consider it. Besides, if any employee were to become disabled, at least the Canada Pension Plan (CPP) disability benefit is available to them.*

*Thank you again.*

#### 4. Continued

(a) (2 points)

- (i) Critique the CFO's assertion concerning the CPP disability benefit.

ANSWER:

- (ii) LEARNING OBJECTIVE 3  
Describe how the disabled employee's group benefits would be impacted if the plan were to terminate.

ANSWER:

- (b) LEARNING OBJECTIVE 5  
(3 points) 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.

ANSWER:

- (ii) Describe the 2014 revisions to CHT payment calculations and what their expected impacts were.

ANSWER:

- (iii) List approaches available to governments to safeguard the sustainability of Canada's health care system.

ANSWER:

#### 4. Continued

- (c) LEARNING OBJECTIVE 3  
(5 points) Calculate the following:

(i) The budgeted group benefits plan costs for 20X2.

*The response for this part is to be provided in the Excel spreadsheet.*

(ii) The raise in employee salaries that the result in (i) would fund.

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

- (d) (1 point) Recommend whether ABC Company should eliminate its group benefits plan in exchange for higher employee salaries. Justify your response.

ANSWER:

## **GH VRC Spring 2024 #4.**

(9 points) You are the group benefits consulting actuary for ABC, a company operating in Manitoba.

You have been engaged by company ABC to conduct a benefits review. ABC is considering adding the following Short-Term Disability (STD) plan on a fully insured basis for which ABC will pay 100% of the premiums:

<b>Provisions</b>	<b>Monthly premium rate</b>	<b>Basis</b>
75% of weekly salary up to \$1,000 3-day elimination period 26-week benefit period	\$0.660	Per \$10 of weekly benefit

(a) (2 points)

- (i) List the criteria that a STD plan needs to meet in order to qualify for the Employment Insurance (EI) Premium Reduction Program (PRP).

ANSWER:

- (ii) Evaluate whether or not the proposed STD plan qualifies for the EI PRP. Justify your answer.

ANSWER:

#### 4. Continued

You are given the following:

- ABC is proceeding under the presumption that the plan qualifies for the EI PRP
- Employees pay EI premiums at a rate of 1.58% of salary to a maximum of \$952.74 annually
- The employer currently pays 1.400 times total employee EI premiums, but this would reduce to 1.163 under the EI PRP if the proposed STD plan were implemented
- Employee salaries and headcounts are as follows:

Annual Salary	ABC's Employee Headcount
\$35,000	75
\$50,000	100
\$60,000	120
\$90,000	5
\$105,000	20
\$120,000	5

- ~~(b) (3 points) Calculate the additional cost to ABC to provide the proposed STD plan. State any assumptions and show your work.~~

~~The response for this part is to be provided in the Excel spreadsheet.~~

- (c) (2 points)

- a. Calculate the minimum amount of EI savings that need to be returned to employees. State any assumptions and show your work.

The response for this part is to be provided in the Excel spreadsheet.

- b. Describe considerations and available options for returning the EI savings to employees.

ANSWER:

#### 4. Continued

ABC considers returning the employee's portion of the EI PRP savings as a cash rebate. The rebate will be the same for all employees before taxes. You are provided with the following assumptions:

- Marginal income tax rate for all employees: 30%
- CPP information:

Contribution rate	5.95%
Yearly Basic Exemption (YBE)	\$3,500
Yearly Maximum Pensionable Earnings (YMPE)	\$66,600

- (d) (2 points) Calculate the total cash rebate on a net basis for all employees. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

## GH VRC Spring 2024 #6.

(10 points) You are the group pricing actuary at ABC Insurance Company. You are responsible for the reporting of industry pooling programs and for establishing EP3 pooling mechanisms for ABC.

You are given the latest information on internal and industry pooling mechanisms:

<b>EP3 Thresholds (per certificate)</b>			
	<b>20X1</b>	<b>20X2</b>	<b>20X3</b>
EP3 Pooling Threshold	\$10,000	\$10,000	\$10,000

<b>Canadian Drug Insurance Pooling Corporation (CDIPC)</b>			
	<b>20X1</b>	<b>20X2</b>	<b>20X3</b>
Initial Threshold	\$65,000	\$65,000	\$65,000
Ongoing Threshold	\$32,500	\$32,500	\$32,500
Coinsurance (amount pooled)	85%	85%	85%
Maximum Pooled Amount	\$500,000	\$500,000	\$500,000

<b>Quebec Drug Insurance Pooling Corporation (QDIPC) – 20X3</b>			
<b>Size of Group (number of certificates)</b>	<b>Pooling threshold</b>	<b>Annual factor - Without dependants</b>	<b>Annual factor - With dependants</b>
Fewer than 25	\$10,000	\$276	\$771
Between 25 and 49	\$18,000	\$188	\$527
Between 50 and 124	\$32,500	\$100	\$339
Between 125 and 249	\$55,000	\$66	\$224
Between 250 and 499	\$80,000	\$50	\$169
Between 500 and 999	\$105,000	\$36	\$142
Between 1,000 and 3,999	\$130,000	\$31	\$123
Between 4,000 and 5,999	\$300,000	\$15	\$60
6,000 and over	n/a	n/a	n/a

(a) (1 point) Describe the three different forms of pooling in group insurance.

ANSWER:

**6. Continued**

(b) (2 points) Describe the rationale for the creation of the following industry pooling programs:

(i) QDIPC

ANSWER:

(ii) LEARNING OBJECTIVE 3  
CDIPC

ANSWER:

(c) LEARNING OBJECTIVE 3 AND 4

(3 points) Summarize QDIPC and CDIPC with respect to:

(vi) Participation of insurers

ANSWER:

(vii) Covered plans

ANSWER:

(viii) Pooling thresholds

ANSWER:

(ix) Sharing of pooled claims among participating insurers

ANSWER:

(x) Pricing of groups within a participating insurer

ANSWER:

## 6. Continued

You are given the following drug claim amounts for XYZ, a small client of ABC, having 6 employees all located in Nova Scotia:

Certificate	Member	20X1	20X2	20X3
1	Employee	\$22,000	\$25,000	\$19,000
2	Spouse	\$35,000	\$750	\$1,000
3	Employee	\$15,000	\$12,000	\$14,000
3	Spouse	\$15,000	\$20,000	\$25,000
4	Employee	\$550,000	\$575,000	\$600,000
5	Employee	\$9,000	\$10,000	\$8,000
5	Spouse	\$60,000	\$75,000	\$80,000
5	Child	\$400	\$200	\$500
6	Employee	\$125,000	\$130,000	\$0

(d) LEARNING OBJECTIVE 3 AND 4

(2 points) Calculate the claim amounts for 20X3 assumed by:

(iv) Industry pooling mechanisms

*The response for this part is to be provided in the Excel spreadsheet.*

(v) XYZ

*The response for this part is to be provided in the Excel spreadsheet.*

(vi) ABC

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

(e) LEARNING OBJECTIVE 3 AND 4

(1 point) Calculate the claim amounts in (d) assuming that this group's employees were located in Quebec. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

**6. Continued**

(f) LEARNING OBJECTIVE 3 AND 4

*(1 point)* Propose a change to the CDIPC pooling program that will help to further preserve the viability and affordability of employers' drug programs. Justify your answer.

ANSWER:

## GH VRC Spring 2024 #9.

(7 points) Company ABC offers employees a comprehensive group benefits package including life insurance, disability (short-term and long-term), medical coverage including prescription drugs, dental coverage, and out-of-province emergency coverage.

Prior to the COVID-19 pandemic, all employees resided in British Columbia (BC) and physically reported to Company ABC's office in Vancouver. As remote work took hold during COVID-19, two employees left the province as noted below:

Employee 1	Moved to Quebec on January 1, 20X1
Employee 2	Moved to Ontario on January 1, 20X1

(a) LEARNING OBJECTIVE 3

(1 point) Describe concerns with respect to Company ABC's group benefits for these two employees.

ANSWER:

(b) (2 points) Compare and contrast eligibility requirements for government health insurance plans (GHIPs) in BC, Quebec and Ontario.

ANSWER:

## 9. Continued

In February 20X1, two employees experience the claims outlined in the table below:

Employee	Service	Description
1	Physician	Experiences stomach pains and visits a physician who advises rest.
1	Emergency surgery	The pain worsens and an emergency surgery is required.
2	Out-of-province	Travels to the United States and has a minor accident resulting in a broken arm. Individual travel coverage was purchased prior to the trip and this provider is contacted first.

- (c) LEARNING OBJECTIVE 3 AND 4  
(4 points) Describe how the costs of the services in the table above would be coordinated between:

- Each employee
- The Company ABC group benefits plan
- Other private coverage
- GHIPs

State any assumptions made.

ANSWER:

*The Excel spreadsheet has  
additional data and information applicable to this question*

## **GH VRC Fall 2024 #2.**

(6 points) You are a benefit consulting actuary for Company ABC, which would like to get a better understanding of the disability benefits available from social programs in Canada.

(a) (3 points) Describe the following government social programs as it relates to disability benefits:

(i) Workers Compensation

ANSWER:

(ii) Employment Insurance (EI)

ANSWER:

(iii) Canada Pension Plan (CPP)

ANSWER:

Two employees became disabled January 1, 2024. Company ABC would like to understand the total disability costs associated with these two employees.

In the Excel spreadsheet, you are provided with the following information:

- Short-Term Disability (STD) and Long-Term Disability (LTD) plan provisions
- Details regarding the disabilities of the two employees
- Annual maximums under CPP

(b) (3 points) Calculate the total STD and LTD benefit costs for each employee at January 1, 2024. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

*The Excel spreadsheet has  
additional data and information applicable to this question*

## **GH VRC Fall 2024 #5.**

(10 points) The benefits department of Company XYZ, a Quebec-based employer, is aware of a brand name maintenance drug whose patent is set to expire next year. At least one generic drug is anticipated to be available once the patent expires.

(a) (1 point) Describe how prices are set for brand name and generic drugs in Canada.

ANSWER:

XYZ has contacted you, a benefits consultant, to help determine its projected savings due to the patent expiry.

In the Excel spreadsheet, you are provided with the following:

- Pricing information regarding the brand name drug
- The current distribution of XYZ employees taking the brand name drug
- Other assumptions

(b) LEARNING OBJECTIVE 3 AND 4

(1 point) Calculate XYZ's current year costs. State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

(c) LEARNING OBJECTIVE 3 AND 4

(6 points) Calculate XYZ's projected costs next year if:

- (i) A physician prescribes the generic drug
- (ii) A physician prescribes the brand name drug and indicates "no substitution"

State any assumptions and show your work.

*The response for this part is to be provided in the Excel spreadsheet.*

(d) (2 points) Recommend four changes to the plan design that XYZ can consider to reduce plan costs. Justify your answer.

ANSWER:



# **Exam GH 201-C**

# **Learning Objective 5**

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*The Excel spreadsheet has  
additional data and information applicable to this question.*

### **GH VRC Fall 2023 #4.**

*(11 points)* You are the group benefits consultant for ABC Company, based in Ontario, and have been negotiating the 20X1 group benefits renewal with their insurer. You successfully negotiated a no-change position to all premium rates for 20X1 and report the good news to the CFO.

You receive the following reply from the CFO:

*Thank you for securing this renewal for 20X1.*

*While the no-change position is great news, our plan remains exposed to many external risks which make next year's renewal difficult to predict. In particular, all the recent discussions over Canada Health Transfer payments have me concerned about further government offloading of costs to employers.*

*We are budgeting a 15% increase for 20X2, but in the event that more is required, we may have to enact contingency plans to remain market-competitive on employee salaries.*

*I would like to start with a worst-case scenario, in which we would eliminate the group benefits plan in its entirety in 20X2 and direct those funds towards employee salaries and applicable payroll taxes (CPP, EI, EHT). Every employee would receive the same raise on a percentage basis.*

*I have attached an Excel spreadsheet with all relevant information necessary.*

*While I am not seeking to cancel the group benefits plan, we must consider it. Besides, if any employee were to become disabled, at least the Canada Pension Plan (CPP) disability benefit is available to them.*

*Thank you again.*

#### 4. Continued

(a) LEARNING OBJECTIVE 4, LEARNING OBJECTIVE 3  
(2 points)

(i) Critique the CFO's assertion concerning the CPP disability benefit.

ANSWER:

(ii) Describe how the disabled employee's group benefits would be impacted if the plan were to terminate.

ANSWER:

(b) (3 points) 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.

ANSWER:

(ii) Describe the 2014 revisions to CHT payment calculations and what their expected impacts were.

ANSWER:

(iii) List approaches available to governments to safeguard the sustainability of Canada's health care system.

ANSWER:

#### 4. Continued

(c) LEARNING OBJECTIVE 3  
(5 points) Calculate the following:

(i) The budgeted group benefits plan costs for 20X2.

*The response for this part is to be provided in the Excel spreadsheet.*

(ii) The raise in employee salaries that the result in (i) would fund.

*The response for this part is to be provided in the Excel spreadsheet.*

State any assumptions and show your work.

~~(d) (1 point) Recommend whether ABC Company should eliminate its group benefits plan in exchange for higher employee salaries. Justify your response.~~

**ANSWER:**