GH FVCC Model Solutions
Spring 2020

1. **Learning Objectives:**
6. The candidate will understand and evaluate post-retirement and post-employment benefits in Canada.

Learning Outcomes:

(6b) Determine appropriate baseline assumptions for benefits and population.

(6c) Determine employer liabilities, service cost and expense for post-retirement and post-employment benefits for financial reporting purposes under IFRS and understand differences compared to US GAAP.

(6e) Describe current issues faced by governments, employers and employees related to post-retirement and post-employment benefits

(6f) Apply actuarial standards of practice to post-retirement and post-employment benefit plans.

Sources:
Morneau Shepell Handbook of Canadian Pension & Benefit Plans, 16th Edition, 2016, Ch. 24: Post-retirement and Post-employment Benefits

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

GHFV-632-13: IAS19

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

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

Commentary on Question:
The question was intended to test the candidate's understanding related to post-retirement health and dental benefits, as well as the interaction between the benefit cost components and the liability when settling liabilities.

Solution:
(a) Identify potential constraints that Russett should consider if they attempt to eliminate post-retirement health and dental benefits.

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1. Continued

     (i)   Communication
- if plan members have been communicated that benefits are offered by the employer, this could be seen as a unilateral contract which was accepted by the employee should they continue to work through retirement.
- considerations must be had for how these benefits were communicated to employees.
- language in communications are important, such as "the right to modify, amend or terminate benefits" to allow employers to make such changes.

     (ii)   Past Guidance
- Court cases/case law has previously indicated that retiree benefits are a form of deferred compensation, and not a "perk"

(b) Calculate and restate each component of the 2020 defined benefit cost using the above assumptions. Show your work.

Step 1 – Calculate the interest cost in 2020 before settlement calculation

2020 Interest Cost (Jan 1 to May 1)	130,400

Step 2 – Settlement gain calculation

Opening Retiree Obligation at December 31, 2019	8,560,000
Prorated 2020 Service Cost Jan 1 to May 1	$0
Prorated 2020 Interest Cost for retiree Jan 1 to May 1	110,800
Prorated 2020 Benefit Payment for retiree Jan 1 to May 1	166,667
Projected Retiree Obligation at May 1, 2020	8,504,133
Average Retiree Obligation at May 1, 2020	53,151
Assumed Uptake	10%
Number of Retiree Accepting	16
Settlement Offer	10,000
Reduction in Obligation	850,413
Cash payment to retirees accepting offer	160,000
Net (Gain)/Loss in Settlement	(690,413)

Step 3 – Calculate 2020 Interest Cost after Settlement

2020 Expected Benefit Payment per retiree (before settleme	3,125
Annual Reduction in Benefit Payment due to settlement	50,000
2020 Expected Benefit Payment (May 1 to Dec 31)	300,000
Projected Total Obligation at May 1, 2020 (before settlement	10,195,400
Projected Total Obligation at May 1, 2020 (after settlement)	9,344,987
2020 Interest Cost (May 1 to December 31)	245,200

Step 4 – Restate Defined Benefit Cost for 2020

Service Cost 2020	605,000
Interest Cost 2020	375,600
Settlement (Gain)/Loss	(690,413)
Total Defined Benefit Cost	290,186

1. Continued

(c)   Critique the assumptions used by the actuarial student to calculate the restated 2020 defined benefit cost.

- Each retiree will not have the same defined benefit obligation or expected benefit payments, as the profile for each employee will be different (i.e. age, gender, utilization, etc.)
- Discount rates are likely not consistent month to month
- 10% acceptance of settlement may not be adequate, as each retiree has different obligations, and could impact the selection choice
- Anti-selection of acceptance as the financial situation or health status of members will impact their choice

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

Learning Outcomes:
(4g)   Explain fair value accounting principles and describe International Accounting Standards (IAS).

(4h)   Construct basic financial statements and associated actuarial entries for a life and health insurance company.

Sources:
GHFV-698-19: CIA Draft Educational Note – Comparison of IFRS 17 to Current CIA Standards of Practice, Sep 2018 (excluding 3.3, 7.3.1, 7.3.3 & 8.1.1)

Commentary on Question:
The question was intended to test the candidate's understanding of the key differences in the measurement of insurance contract liabilities between IFRS 17 and current CIA Standards of Practice.

Solution:
(a)   Describe and compare the "building blocks" under IFRS 17 to the current CIA standards.

   Commentary on Question:
   The candidates did well in identifying the building blocks under IFRS, but could have elaborated more on descriptions.

   - Present value of future cash flows
     - Represent the probability weighted discounted expected cash flows
     - Conceptually similar to current CIA liability without PfADs

   - Risk adjustment for non-financial risk
     - Similar to current CIA PfADs for non-economic risks
     - No provision for interest rate risk

   - Contractual service margin (CSM)
     - Represents the unearned profit from a group of insurance contracts
     - Established so there is no front-ending of profits
     - Unrecognized profit deferred
     - Amortized over coverage period
     - New concept versus current CIA standards which allow front-end of profit at issue

2. **Continued**

(b)   Describe the "contract boundary" under IFRS 17.

Commentary on Question:
In general, this question was not well answered by candidates.

- IFRS 17 requires the entity to identify the contract boundary for each contract so that only cash flows related to claims incurred within the boundary of the contracts in the group are included in the estimates of future cash flows.
- The contract boundary under IFRS17 is usually equal to the length of the liability for life insurance benefits
- The contract boundary for group life/health benefits, which typically renew annually, ends at the next renewal date.

(c)   Evaluate the contract boundaries under IFRS 17 for the following contracts. Justify your response.

   (i)   A 30-year reinsurance contract where the cedent (insurer) has the ability to cancel the contract at year 20 from the insurer's perspective.

   (ii)   A 30-year reinsurance contract where the cedent has the ability to recapture at year 20 from the reinsurer's perspective.

   (iii)   A 2-year group life contract where the policyholder has ability to extend the coverage for 18 more years at a guaranteed premium rate from the insurer's perspective.

Commentary on Question:
Candidates were able to correctly evaluate and justify the contract boundary.

   (i)   Contract boundaries: Year 20 and then Year 30
   - Year 20: Insurer can cancel coverage at year 20, effectively ending the first contract and its associated boundary.
   - Year 30: Insurer can cancel at either 20 years or 30 years. Management's decision on cancellation or not is a judgement.

   (ii)   Year 30
   - Only the insurer can cancel in year 20. Reinsurer's view is null.

   (iii)   Year 20
   - Since the insurer can terminate the policy or change the rate at the end of 20 years, this is treated as the contract boundary. The insurer would have accounted for this in their CF already.

2. Continued

(d) You are asked to review the IFRS 17 implications on a five-year group life coverage with premium guarantee in the first two years. You are provided with the following:

	Year 1	Year 2	Year 3	Year 4	Year 5
Premiums (beginning of year)	$100	$100	$110	$120	$130
Expected Claims (end of year)	$80	$85	$90	$100	$110
Cost of Capital (beginning of year)	$12	$11	$11	$12	$13
Lapse Rate	0%	0%	30%	30%	100%

Assume the following:

- Discount Rate is 3%
- Risk Adjustment is calculated as the present value of cost of capital

Calculate each of the building blocks for this contract at time 0. State your assumptions and show your work.

Commentary on Question:
In general, candidates did not recognize that the contract boundary stops at 2 years.

- Identify contract boundary is at the end of the second year. Any CFs beyond year two are excluded.
- PV Premium (since lapse in year 1 is 0%)
  = -100 + -100/1.03 = -197.09
  *question stated premium is paid at the beginning of year
- PV Claim (since lapse in year 1 is 0%)
  = 80/1.03 + 85/1.03^2 = 157.79
  *question stated claim is paid at the end of year
- Best estimate liability = -197.09+157.79 = -39.30
- Risk Adjustment = PV Cost of Capital
  = 12 + 11/1.03 = 22.68
- CSM is max of (0, - (Best Estimate Liability+ Risk Adjustment))
  = - (-39.30+22.68) = 16.62

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

Learning Outcomes:
(4a)   Interpret insurer financial statements from the viewpoint of various stakeholders.

(4b)   Evaluate key financial performance measures used by life and health insurers for
       both short and long-term products.

(4c)   Project financial outcomes and recommend strategy to senior management to
       achieve financial goals.

Sources:
GHFV-699-19: OSFI Guideline – Source of Earnings Disclosure

Commentary on Question:
*The question was intending to test the candidate's understanding of a Sources of
Earnings analysis. In particular, its use and purpose and understanding and calculating
disclosures, and applying the knowledge to make recommendations.*

Solution:
(a)   Define the use and purpose of a SOE analysis.

       Commentary on Question:
       Candidates generally had issues citing all the purposes/uses of an SOE analysis

         • Source of earnings is a method to identify and quantify the various sources
           of IFRSs income of a life insurance company
         • Shows the net income in a different format from the traditional income
           statement form
         • Provides the differences between actual income and the income that have
           been reported if all the assumptions at the beginning of the reporting
           period had occurred during the reporting period
         • OSFI suggests that the SOE to appear in the public financial statements or
           part of other disclosures in the company's annual reports.

(b)   List the minimum disclosure requirements for a SOE analysis.

       Commentary on Question:
       In general, candidates were able to cite only a few of the requirements.

3. **Continued**

- OSFI expects the disclosure to show at least two years' results
- The following items are required in a source of earnings analysis
  - Expected profit on in-force business
  - Impact of new business
  - Experience gain & losses
  - Management actions and changes in assumptions
  - Earnings on Operations (pre-income tax)
  - Earnings on Surplus
  - Income before income tax
  - Income Tax
  - Net Income

(c)

(i)   Calculate the following for 2018 and 2019:

- new business impact
- experience gain/loss

State your assumptions and show your work.

Commentary on Question:
In general, this question was not well answered by candidates.

- Premiums & claims can be found in the case study.

Source of Earnings Analysis

		2019	Premiums	Claims	
1	Expected Profit on In-Force Business *	1300	3420	-2120	DI (in 2018)
1	Impact of New Business	3231	11145	-7914	Supp Medical, Group Life, Ancillary Products
2	Experience Gains & losses	-245	2572	-1517	DI (in 2019)

		2018	Premiums	Claims	
1	Expected Profit on In-Force Business *	1954	5280	-3326	DI (in 2017)
1	Impact of New Business	3028	10822	-7794	Supp Medical, Group Life, Ancillary Products
2	Experience Gains & losses	-654	3420	-2120	DI (in 2018)

(ii)   Recommend steps Pinewood can take in 2020 to improve its earnings results. Justify your response.

3. **Continued**

Commentary on Question:
In general, candidates were able to provide recommendations, even if the wrong SOE calculations were completed.

Answer:

- Based on the SOE analysis, the disability insurance benefit has had losses in both 2018 and 2019. Management needs to think about how to improve the results on this benefit.

- Possible recommendations include:
    - Review the assumptions for the DI block
    - Change the assumptions for the MfAD
    - Check if there are errors:
        - Claims adjudication
        - Assumptions may be applied incorrectly
        - Reserve setting methods/calculations
    - Perhaps engage a reinsurance carrier to sell off the DI block
    - Voluntary buyout offers

4.   **Learning Objectives:**
1.   The candidate will understand and apply valuation principles for insurance contracts.

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

Learning Outcomes:
(1c)   Calculate appropriate claim reserves given data.

(1e)   Evaluate data resources and appropriateness for calculating reserves.

(3a)   Describe eligibility requirements for social programs in Canada and the benefits provided.

(3b)   Describe how private group insurance plans work within the framework of social programs in Canada.

Sources:
Morneau Shepell Handbook of Canadian Pension Benefit Plans, 16th Edition, 2016 - Ch. 2: Government Pension Programs (pp. 48-72, Canada & Quebec Pension Plans)

GHFV-694-19: Guide to Canada Benefits Legislation, 2018, sections 4

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a)
(i)   List the eligibility requirements for CPP disability benefits.

(ii)   Describe the 2016 CPP expansion.

(iii)   Explain how the CPP expansion will impact the LTD benefits paid by Thunderball.

Commentary on Question:
In general, candidates did not know many of the eligibility requirements for CPP disability payments.

4. Continued

(i)

• The individual has contributed to CPP/QPP in four of the last six years
• Contribution must be on earnings that are at least 10% of the YMPE
• The individual is deemed to have a severe and permanent disability
• The individual is under age 65

(ii)

• Replacement rate on pensionable income set to increase from 25% to 33% on service accrued after January 1, 2019
• Contribution rate on earnings will also increase by approximately 1% for employees and employers (2% total)
• The above will be phased over five years (2019 - 2023)
• New tier of contribution will apply for earnings between the YMPE and a new maximum, which is 14% higher than current limit
• Contribution rate for new tier will be approximately 4% of earnings for both employers and employees
• New tier will be phased in from 2024 to 2025

(iii)

• Since retirement pension is going up to 33% on pensionable income, the variable component will also increase under the current CPP disability formula
• This will be a direct offset to the LTD plan and may reduce overall claims paid in the future

4. **Continued**

(b)

    (i)   Calculate the best estimate reserves for Thunderball for each of the disabled members. State your assumptions and show your work.

    (ii)   Assess the reasonableness of Thunderball's reported reserves using your response from (i). Justify your response.

    (iii)   Describe possible reasons why Scott's claim was approved under the Gym-N-Juice LTD plan but rejected under CPP disability benefit.

Commentary on Question:
This question was well answered by candidates, except the part of the question pertaining to the calculation of the CPP offset amounts.

(i)

1. Identify the corresponding reserve factors from Thunderball Reserve in Case Study

	Duration (Months)	Age disabled	Gender	Reserve Factor
Andrew	48	38	M	102.09
Jessica	9	49	F	61.00
Scott	27	32	M	80.10

2. Calculate LTD plan's monthly benefit
   - Monthly Benefit = Min ($3,500 , pre disability earnings x 66.67% / 12)
   - Andrew Monthly Benefit = $3,056
   - Jessica Monthly Benefit = $3,500
   - Scott Monthly Benefit = $2,889

3. Calculate CPP disability offset benefit
   - From study note: variable portion is 75% of the contributor's retirement pension and contributor's retirement pension is 25% of their average monthly pensionable earnings
   - Variable amount = Average monthly pensionable earnings x 0.75 x 0.25
   - Total offset amount = Min (variable amount + flat amount, CPP Disability Max)
   - CPP offset assumed incorporates 60% factor for pending claim (Jessica) and 0% factor for rejected claim (Scott)

4. **Continued**

	Variable amount	Flat amount (based on year approved)	Total offset amount	CPP offset assumed
Andrew	$531	$466	$997	$997
Jessica	$376	$485	$861	$517
Scott	$437	$471	$908	$0

    4. Calculate the net benefit and apply it to reserve factor
- Net benefit = Monthly benefit – CPP offset assumed
- Calculated reserve = net benefit x reserve factor

	Net benefit	Calculated reserve
Andrew	$2,059	$210,203
Jessica	$2,983	$181,963
Scott	$2,889	$231,409

(ii)

- Thunderball's reported reserves match what was calculated for Andrew and Scott but are higher than what was calculated for Jessica. It appears that Thunderball is only taking into consideration CPP once it is approved.

(iii)

• CPP benefit is adjudicated separately from the LTD plan and the two are not linked
• Need to have contributed at least 4 of the last 6 years prior to disability, given Scott's age it is possible he has not met this requirement
• CPP benefit have a different definition of disability compared to the company's LTD plan (i.e. CPP requires disability to be severe and prolong)

5. **Learning Objectives:**
3.   The candidate will understand how to describe and evaluate government programs providing health and disability benefits in Canada.

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

Learning Outcomes:
(3a)   Describe eligibility requirements for social programs in Canada and the benefits provided.

(3b)   Describe how private group insurance plans work within the framework of social programs in Canada.

(5b)   Describe the major applicable laws and regulations and evaluate their impact.

Sources:
GHFV-686-18: Morneau Shepell New & Views, Volume 13, Issue 12, Dec 2016

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

Commentary on Question:
This question was intended to test EI changes, LTD integration with CPP and the non-taxable nature of employee paid LTD.

Solution:
(a)   In 2016, the federal government announced changes to the Employment Insurance rules effective January 1, 2017.

   (i)   Describe the changes.

   (ii)   List and describe the key implications for plan sponsors.

   Commentary on Question:
   This question was well answered by candidates.

   (i)
   - Waiting period reduced from 2 weeks to 1 week
   - Premiums reduced from $1.88/$100 of earnings to $1.63/$100 of earnings

   (ii)
   - Plan sponsors with STD plans with 2 week waiting periods may wish to reduce the waiting period to 1 week to match the EI program

5. Continued

- SUB plan designs may need to be modified to wrap around the reduced waiting period
- Transitional provision to Jan 3, 2021 that allows combined EI and ER wage replacement benefits to exceed 95% limit during second week of disability
- Plan sponsor has until January 3, 2021 to update their plans while continuing to qualify for participation in the PRP
- Plan sponsors relying on EI benefits during LTD waiting period may consider adjusting their LTD waiting period (from 17 weeks to 16 weeks) to coordinate with changes in EI benefits
- Plan sponsors with other arrangements should consider the impact of any potential changes on expected costs, disability management best practices and other factors

(b) Employee A's only disability income will come from LTD and CPP. Assume an effective tax rate of 30%.

(i) Calculate the net disability income Employee A will receive from each source, and in total, in 2019, 2020, and 2021. Show your work.

(ii) Effective January 1, 2020, the LTD plan was amended such that benefit amounts will be increased by 2.0% each January 1.

Calculate the disability income Employee A will receive from each source, and in total, in 2020 and 2021. State any assumptions and show your work.

Commentary on Question:
In general, this question was not well answered by candidates.

(i)

- CPP disability benefits:
    - 2019: 500 (given)
    - 2020: 500 x 1.01 = 505
    - 2021: 520 x 1.02 = 515.10
- LTD benefits
    - Total 1,500
    - Assuming CPP disability reduces benefit of $1,500 by $500 = 1,000 (Credits were also given if offset not assumed)

5. **Continued**

- Total
    - 2019: 1,500
    - 2020: 1,505
    - 2021: 1,515.10
- Plan is 100% EE-paid so no tax deducted from LTD benefits (Credits were also given if taxes from CPP disability calculated)

(ii)

- CPP benefits (already calculated):
    - 2019: 500 (given)
    - 2020: 500 x 1.01 = 505, increase = 5
    - 2021: 520 x 1.02 = 515.10, increase = 10.10
- LTD benefits
    - o Since the LTD plan includes COLAs, LTD benefit may be reduced by the lesser of:
        1. CPP COLA occurring after LTD benefit becomes payable, and
        2. Proportion of such adjustment that the percentage rate of the COLA made under the LTD plan during the same period is of the percentage rate of the COLA made under CPP
    - 2019: 1,500 – 500 = 1,000
    - 2020:
        1. 1,500 x 1.02 – 505 = 1,025
        2. 1,500 x 1.02 – 500 - (5 x 2%/1%) = 1,020
        - Since 1. produces the larger value to claimant, this is what will be paid by the LTD plan
    - 2021:
        1. 1,500 x 1.02 x 1.02 – 515.10 = 1,045.50
        2. 1,500 x 1.02 x 1.02 – 500 – 10 - (10.10 x 2%/2%) = 1,040.50
        - Since 1. produces the larger value to claimant, this is what will be paid by the LTD plan

- Total
    - 2019: 1,500
    - 2020: 1,530
    - 2021: 1,560.60
- Plan is 100% EE-paid so no tax deducted on LTD payment

6. **Learning Objectives:**

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

Learning Outcomes:

(3a)   Describe eligibility requirements for social programs in Canada and the benefits provided.

Sources:

GHFV-694-19: Guide to Canada Benefits Legislation, 2018, section 5

Morneau Shepell Handbook of Canadian Pension Benefit Plans, 16th Edition, 2016, Ch. 19: Employment Insurance

GHFV-686-18: Morneau Shepell New & Views, Volume 13, Issue 12, Dec 2016

Commentary on Question:

In general, this question was not well answered by candidates. More particularly, candidates had limited knowledge of the Quebec Parental Insurance Plan (QPIP).

Solution:

(a)   Compare and contrast key benefit provisions of the basic plan and the special plan offered under the Quebec Parental Insurance Plan (QPIP).

	Basic Plan		Special Plan	
Benefit Type	Benefit Duration	Benefit Level	Benefit Duration	Benefit Level
Maternity	18 weeks	70%	15 weeks	75%
Paternity	5 weeks	70%	3 weeks	75%
Parental	7 weeks	70%	25 weeks	75%
	25 weeks	55%		
Adoption	12 weeks	70%	28 weeks	75%
	25 weeks	55%		

6. Continued

(b)   Evaluate which QPIP plan Emma and James should choose to maximize their career lifetime value under these programs. Show your work.

• **Cost:**   − Emma works 25 years: 25 years of EI and QPIP premiums   − James works 30 years: 30 years of EI and QPIP premiums
• QPIP premium (2017):   − $397.30*30 (James hits maximum earnings)   − + $65,000*0.548%*25   − = 20,824   − (or $405.52*30 + $65,000*0.559%*25=21,071 for 2018)
• EI premium (2017) (both above earnings maximum):   − $651.51*55 for 2017=35,833   − (or $672.10*55=36,966 for 2018)
• Total cost=$56,657   • (or $58,037 for 2018)
Basic Plan benefits
• Emma takes maternity 18 weeks   Emma's after tax income: $65,000/52*18*0.70*(1-0.3)=11,025
• James takes paternity 5 weeks   James' after tax income: $75,000/52*5, income capped at $72,500 in 2017 so $72,500/52*5*0.70*(1-0.3)=3,416
• Emma takes full parental leave 7 weeks @ 70% and 25 weeks @ 55% (Emma should take parental leave as she is the lower earner)   − Emma's after tax income: $65,000/52(7*0.70+25*0.55)*(1-0.3)=16,319
• Total = $30,760

6. **Continued**

Special Plan benefits

• Emma takes maternity 15 weeks
    – Emma's after tax income:
        $65,000/52*15*0.75 * (1-0.3)=9,844

• James takes paternity 3 weeks   James' after tax income: $75,000/52*3, income capped at $72,500 in 2017 so $72,500/52*3*0.75 *(1-0.3)=2,196

• Emma takes full parental 25 weeks @ 75% (Emma should take parental leave as she is the lower earner)
    – Emma's after-tax income:
        $65,000/52*25*0.75*(1-0.3) =16,406

• Total = $28,446
• Emma and James should choose the basic plan since this provides the maximum benefit from the plan
• Total benefits from plan = 2 x $30,760 = $61,520
• "Lifetime" net benefit = $61,520 – $56,657=$4,863 for 2017
• (or 61,520-58,037=3,483 for 2018)

(c) The federal government is considering making benefit improvements such as extending the duration or increasing the maximum benefits to EI.

List factors the Quebec government should consider as it addresses the adequacy of its QPIP plan.

- Factors that Quebec government should consider if federal government enhances EI:
    - Increase Quebec EE and ER premiums
    - Modify QPIP eligibility rules
    - Extend QPIP duration and benefit amount

- Other considerations:
    - Increase payroll taxes to cover enhancement in benefits
    - Modify RAMQ terms (i.e. premiums/deductibles/co-insurance, etc.)

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

Learning Outcomes:
(5b) Describe the major applicable laws and regulations and evaluate their impact.

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

Sources:
GHFV-700-19: Ch. 12 (sections 12.1-12.4) and 13 of Canadian Handbook of Flexible Benefits, McKay, Robert J., 3rd Edition

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a)
(i) Explain the tax implications, from the employees' perspective, for each of the benefits offered by Rigdon.

(ii) Describe any changes to the tax implications, from the employees' perspective, that would result from moving the insured benefits from employer-paid to employee-paid.

Commentary on Question:
In general, the candidates that answered this question correctly had a good understanding of taxation of benefits. Candidates mainly missed the implications of taxation of benefits in Quebec (health, dental and HSA benefits).

(i)
- Medical and dental: claims plus expenses are not a taxable benefit to employee except in Quebec
  - Benefits paid are not taxable
- STD and LTD: contributions are not a taxable benefit to employee
  - Benefits paid are taxable since ER contributes to the plan
- Life: premiums paid are a taxable benefit to EE
  - Benefits paid are not taxable
- HSA: benefits paid are not taxable except in Quebec

7. Continued

(ii)

- Life: if EE-paid, premiums are no longer a taxable benefit
- LTD: if EE-paid, benefits paid are no longer taxable

(b) Fenton Inc., one of Rigdon's competitors, offers a flexible benefit plan to its employees.

    (i) List and briefly describe the key principles governing the structure of a flexible benefit plan.

    (ii) Describe the Canadian Revenue Agency (CRA)'s rules with respect to rollovers of credits and claims under an HSA.

Commentary on Question:
In general, this question was not well answered by candidates.

(i)
- Inputs and options
  - Inputs: sources of funds that employees can direct towards certain benefits
  - Options: various avenues open to employees to allocate the funds
- Benefit elections must be made on a prospective basis, namely, in advance of the plan year to which they relate
- Elections must be irrevocable by the employee for the duration of the plan year
  - One exception to this is in the event of a change in family status of an employee ("life event"), e.g. birth or death of a dependent, change in marital status, loss of insurance under a spouse's plan
  - Another exception is a change in employment status (e.g. part-time to full-time)
  - Any changes only apply to the future
- Constructive receipt: should not apply if plan is designed correctly
- Statutory arrangements and plans (SDAs, RCAs, EBPs, employee trusts, PHSPs) should be considered in setting up a flex plan
- HSAs: typically provided as an option under flexible benefits plans

7. **Continued**

(ii)

- Excess HSA balances may be rolled over for up to twelve months after the end of the plan year and be used to reimburse the following year's expenses
- One-year rollover period does not have to expire on termination of employment or retirement
- Alternatively, unreimbursed expenses may be rolled over for up to twelve months after the end of a plan year and may be claimed from the following year's HAS
- Note, however, that the participant must have allocated funds to the HSA in the prior year in order to be allowed to roll expenses forward; otherwise, according to the CRA, the HSA would not have the requisite element of insurance, as there would be little or no risk
- A plan that allows employees to roll over both excess claims and unused allocations will not qualify as a PHSP
- Reasonable "grace periods" following the end of a plan year within which an employee can submit a claim are acceptable
- Unused flexible benefit credits may be rolled over on retirement to a retiree HAS
- Although administratively complex, it is possible in some circumstances to offer employees the choice each plan year between rolling over excess expenses or unused flexible benefit credits
- A portion of a bonus may, under appropriate circumstances, be allocated to an employee's HSA

(c)

(i) Calculate the total financial implication for each employee to maintain their current coverage level, including any applicable tax implications. State any assumptions and show your work.

(ii) Critique the new FlexBen program.

Commentary on Question:
Candidates in general answered part (i) of the question well, however they had difficulty with part (ii).

7.   **Continued**

(i)

Age	M	F
Under 50	360	240
50 and over	840	600
Current average premium	400	
Effective tax rate	25%	

	Jean – 60 year old female	George – 30 year old male
Current cost		
A - taxes	400 x 25% = 100	400 x 25% = 100
New cost		
B - actual premium less credits	600 – 400 = 200	360 – 400 = -40
C - taxes	400 x 25% = 100	400 x 25% = 100
D = (B+C) - total	300	60
(D – A) - Financial impact	200	-40

(ii)
- Employees are being taxed on the average premium rate rather than what they actually pay
  - eg. Jean is paying less tax than she should, George is paying more than he should
- Credits are insufficient to maintain coverage for some EEs and more than required for others

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

Learning Outcomes:
(4b) Evaluate key financial performance measures used by life and health insurers for both short and long-term products.

(4c) Project financial outcomes and recommend strategy to senior management to achieve financial goals.

Sources:
GHFV-693-19: OFSI Guidelines for Life Insurance Capital Adequacy Test (LICAT), Section 6.3 Longevity Risk

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a)
(i) Define the longevity risk under the LICAT framework.

(ii) State the formula and components used to calculate longevity risk.

Commentary on Question:
In general, this question was well answered by candidates. Candidates who include descriptions of the level risk and trend risk get full credits.

(i) Longevity risk is the risk associated with the increase in liability cash flows due to increases in life expectancy caused by changes in the level and trend of mortality rates

(ii) To calculate longevity risk required capital for each geography:

(iii) $RClongevity = RClevel + RCtrend$

- Level risk: misestimation of the level of Best Estimate Assumptions

- Trend risk: misestimation of the future trend of Best Estimate Assumptions

8. Continued

(b)   Describe how each longevity risk component is calculated.

Commentary on Question:
In general, this question was well answered by candidates.

- The required capital is calculated as the difference between the present value of the shocked cash flows and the present value of the best-estimate cash flows.
- Level shock: the required shock is a permanent decrease in Best Estimate Assumptions for mortality rate at each age.
- Specific level risk shock ranges from 10% to 20% depending on geography and whether the products are registered.
- Trend shock: a 75% increase in the Best Estimate Assumption for mortality improvement. The shock applies per year of mortality improvement forever. (i.e., shocked cash flows for trend risk are calculated using best estimate cash flows with 175% of the Best Estimate Assumption for mortality improvement).

(c)
    (i)   Explain how the calculation would differ between the policies sold to Julien and Tom.

    (ii)   State the shock factors to be used for policies sold to Julien and Tom. Justify your response.

Commentary on Question:
In general, this question was well answered by candidates.

    (i)   Two main differences between Julien's and Tom's policies:
- Julien's policy is a registered annuity purchase, whereas Tom's policy is a non-registered purchase. This leads to different shocks used for the level risk calculation
- Shock for the level risk calculation differs by geography. Julien bought the policy in Canada while Tom bought the policy in the U.S.

    (ii)   Based on the above, the level longevity risk shock should be 20% for Tom and 10% for Julien.
- The required trend longevity risk shock factor would be the same for Tom and Julien (same for all annuity products) – at 75%.
- That is, the shocked cash flows for trend risk are calculated using best estimate cash flows with 175% of the Best Estimate Assumption for mortality improvement.

8. Continued

(d) Calculate the LICAT longevity risk capital for Tom's policy. State your assumptions and show your work.

Commentary on Question:
- *In general, candidates had challenges getting every step completed accurately.*
- *In Step 1, errors were typically made because candidates did not get the timing of payments accurate. However, candidates were not penalized for replicating this error in Step 2 and Step 3.*
- *In general, the adjustments to the mortality was completed accurately.*

Step #1 – Calculate Tom's Baseline (PV Baseline Benefits)

Calculating Baseline	1/1/2019	1/1/2020	1/1/2021	1/1/2022
Benefit		$5,000	$5,000	$5,000
Age	65	66	67	68
Mortality Rate	2%	2%	2%	
Mortality Improvement (MI)	1%	1%	1%	
MI adjustment factor	0.9900	0.9801	0.9703	
Mortality Rate – adjusted for MI	1.98%	1.96%	1.94%	
Lapse	Policy was bought upfront, so no lapse rate			
Interest rate		3%	3%	3%
Mort. Factor	0.9802	0.9610	0.9423	
Interest factor	0.9709	0.9426	0.9151	
PV Baseline Benefits	$13,599.22			

Step #2 – Calculate Tom's Level Shock (PV Level Shock Benefits)

In this step it is important to know that Tom's mortality improves by 20%. The calculation flows through in the same manner as the baseline calculation.

Calculating Level Shock	1/1/2019	1/1/2020	1/1/2021	1/1/2022
Benefit		$5,000	$5,000	$5,000
Age	65	66	67	68
Mortality Rate	1.6%	1.6%	1.6%	
MI	1%	1%	1%	
MI adjustment factor	0.9900	0.9801	0.9703	

Mortality Rate - adjusted for MI	1.5840%	1.5682%	1.5525%	
Lapse	Policy was bought upfront, so no lapse rate			
Interest rate		3%	3%	3%
Mort. factor	0.9842	0.9687	0.9537	
Interest factor	0.9709	0.9426	0.9151	
PV Level Shock Benefits	$13,706.86			
Level Shock	**$107.64**			

RC $_{Level\ Shock}$ = PV Level Shock Benefits – PV Baseline Benefits

RC $_{Level\ Shock}$ = $13,706.86 - $13,599.22

RC $_{Level\ Shock}$ = $107.64

Step 3 – Calculate Tom's Trend Shock (PV Trend Shock Benefits)

In this step it is important to know that Tom's mortality deteriorates by 75%. The calculation flows through in the same manner as the baseline calculation.

Calculating Trend Shock	**1/1/2019**	**1/1/2020**	**1/1/2021**	**1/1/2022**
Benefit		$5,000	$5,000	$5,000
Age	65	66	67	68
Mortality Rate	2%	2%	2%	
Mortality Improvement (MI)	1.750%	1.750%	1.750%	
MI adjustment factor	0.9825	0.9653	0.9484	
Mortality Rate - adjusted for MI	1.9650%	1.9306%	1.8968%	
Lapse	Policy was bought upfront, so no lapse rate			
Interest rate		3%	3%	3%
Mort. factor	0.9804	0.9614	0.9432	
Interest factor	0.9709	0.9426	0.9151	
PV Trend Shock Benefits	$13,605.90			
Trend Shock	**$6.68**			

RC $_{Trend\ Shock}$ = PV Trend Shock Benefits – PV Baseline Benefits

RC $_{Trend\ Shock}$ = $13,605.90 - $13,599.22

RC $_{Trend\ Shock}$ = $6.68

8. **Continued**

      Step 4 – Calculation of the Longevity Risk (Required results from Step 2 and Step 3)

$$RC_{longevity} = RC_{level} + RC_{trend}$$

Calculating Longevity risk	$ 114.32