1. **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:**
(4h) Construct basic financial statements and associated actuarial entries for a life and health insurance company.

**Sources:**
GHFV-693-19: OFSI Guidelines for Life Insurance Capital Adequacy Test (LICAT)

**Solution:**
(a) Define and describe the purpose of:
   (i) LICAT total ratio
   (ii) LICAT core ratio

   • Both LICAT ratios measure the capital adequacy of an insurer and is one of the several indicators used by OSFI to assess an insurer’s financial condition. LICAT Total Ratio focuses on policyholder and creditor protection (e.g., during wind-up). LICAT Core Ratio focuses on financial strength of an insurance company (e.g., when an insurer is under stress).
   • OSFI has established a Supervisory Target Total Ratio of 100% and a Supervisory Target Core Ratio of 70%.
   • The Supervisory Targets provide cushions above the minimum requirements, provide a margin for other risks, and facilitate OSFI’s early intervention process.
   • Insurers are required, at minimum, to maintain a Total Ratio of 90% and a Core Ratio of 55%.

(b) State the formula for:
   (i) LICAT total ratio
   (ii) LICAT core ratio
1. Continued

\[
\text{LICAT Total ratio} = \frac{\text{Available Capital} + \text{Surplus Allowance} + \text{Eligible Deposits}}{\text{Base Solvency Buffer}}
\]

\[
\text{LICAT Core ratio} = \frac{\text{Tier 1 Capital} + 70\% \text{ of Surplus Allowance} + 70\% \text{ of Eligible Deposits}}{\text{Base Solvency Buffer}}
\]

(c) Describe each of the major risks that Belmont should consider, as categorized by the Office of the Superintendent of Financial Institutions Canada (OSFI) and measured under LICAT.

**Credit risk:**
- Risk of loss arising from the potential default of parties having a financial obligation to the insurer.
- Required capital takes account of the risk of actual default as well the risk of an insurer incurring losses due to deterioration in an obligor’s creditworthiness.
- The financial obligations to which credit risk factors apply include loans, debt instruments, reinsurance assets and receivables, derivatives, amounts due from policyholders, agents and brokers and other assets.
- In general, required capital is calculated by applying credit risk factors to the balance sheet values of these assets.

**Market risk**
- Market risk arises from potential changes in rates or prices in various markets such as those for bonds, foreign currency, equities and commodities.
- Exposure to this risk stems from investment and other business activities that create on- and off-balance sheet positions.
- Market risk in the LICAT includes interest rate, equity, real estate, and currency risks.
  - Interest rate risk is the risk of economic loss resulting from market changes in interest rates. The most significant aspect of this risk is the net effect of potential changes in interest rates on the values of interest-sensitive assets and liabilities whose cash flows may be mismatched.
  - Equity risk is the risk of economic loss due to potential changes in the prices of equity investments and their derivatives. This includes both the systematic and specific components of equity price fluctuation.
  - Real estate market risk is the risk of economic loss due to changes in the amount and timing of cash flows from investment property, and holdings of other property, plant and equipment.
  - Currency risk is the risk of economic loss due to changes in the amount and timing of cash flows arising from changes in currency exchange rates.
1. Continued

**Insurance risk**
- Insurance risk is the risk of loss arising from the obligation to pay out benefits and expenses on insurance policies and annuities in excess of expected amounts.
- Insurance risk includes:
  - 1) Mortality risk on life insurance;
  - 2) Longevity risk on annuities;
  - 3) Morbidity risk on disability insurance (DI), long-term disability (LTD), short-term disability (STD), critical illness (CI), long-term care (LTC), accident & sickness insurance (A&S), and waiver of premium benefits (WP);
  - 4) Lapse and policyholder behavior risk; and
  - 5) Expense risk.

**Segregated funds guarantee risk**
- Risk associated with investment or performance-related guarantees on segregated funds or other similar products.
- The risk is determined using prescribed or approved factors, or an approved internal model.

**Operational risk**
- Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events.

(d) Describe how to calculate the required capital for the interest rate risk.

- A projected cash flow methodology is used to measure the economic impact of sudden interest rate shocks.
- Required capital for interest rate risk is calculated as the maximum loss under four different prescribed stress scenarios.
- For each scenario, the loss is defined as the decrease in the insurer’s net position after revaluing asset and liability cash flows by changing the discount rates from those of the initial scenario to those of the stress scenario.
- The net position used to measure the loss in each scenario is equal to the difference between the present values of asset cash flows (including assets backing capital or surplus) and liability cash flows.
- Required capital for interest rate risk is calculated for each geography (Canada, the United States, the United Kingdom, Europe other than the United Kingdom, Japan, and other locations).
1. Continued

(e) Calculate the initial scenario discount rates for cash flows at year 19, year 45, and year 71 for Belmont. Show your work.

- Initial scenario discount rates = risk-free rate + spread
- The sum should grade to an ultimate interest rate (UIR) plus an ultimate spread.
- Risk-free rate for Canada is the spot rate for Government of Canada bonds, which is 1.80% as provided in the question.
- UIR for Canada is 4.50% as prescribed by OSFI.
- Ultimate spread is 80 bps as prescribed by OSFI (at year 70 and beyond).
- Average market spread = average 5-year Corporate bond yield of 2.80% - spot-rate for 5-year GOC bonds of 1.80% = 1.00%

Based on the above, the initial scenario discount rates for Belmont are:

- For cashflows at year 19 (or between year 0 to year 20):
  Discount rates = risk-free rate + 90% of the market average spread
  = 1.80% + 90% x 1.00% = 2.70%

- For cashflows at years 71 (or at year 70 and beyond):
  Discount rates = UIR + ultimate spread
  = 4.50% + 0.80% = 5.30%

- For cashflows at year 45 (or between year 20 and year 70):
  Discount rate = spot rate linearly interpolated between the 20-year risk-free rate and the UIR + spread linearly interpolated between 90% of the market average spread and the ultimate spread
  = (1.80% + 4.50%) / 2 + (90% x 1.00% + 0.80%) / 2 = 4.00%

Alternatively, candidates can get the same answer by: (2.70% + 5.30%) /2 = 4.00%
2. **Learning Objectives:**

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

**Learning Outcomes:**

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

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

**Sources:**

FV Can LO3 New 1 – Cowan Guide to Canada Benefits Legislation 2018 (Sec 4,5,6,7.1,7.2,7.2.1, 7.2.5, 7.2.6)

Morneau Shepell Handbook of Canadian Pension Benefit Plans, 16th Edition, 2016 (Chapter 17)


**Solution:**

(a) Outline what the CEO should consider before offering the Liberty private drug plan to Green employees in Quebec.

- Prescription drug insurance coverage has been compulsory for all Quebec residents; they are either covered under a private plan or the public plan. Given Green didn’t have any private drug plan, it is likely that existing employees are currently on the public plan.

- Anyone under the age of 65 who has access to private drug plan must become member of the plan, as must their spouse and children who are living with them. So by extending drug coverage to Green employees, all existing employees must join the plan.

- All private drug plans must provide benefits for their Quebec certificate holders, which are equal to or better than the RAMQ plan. This has the following implications:
  - The Green drug plan’s maximum out of pocket expenses should at least match that of RAMQ
  - The list of drugs currently covered is in accordance to BC PharmaCare, should make sure to cover the list of drugs under RAMQ
2. Continued

- RAMQ reviews plan features annually on July 1st, Liberty should prepare to review the existing plan provisions and make adjustments accordingly to the private drug plan.
- Must match the existing coinsurance under RAMQ, which is 65.2% and higher than existing coinsurance of 60%.
- Should revisit whether the annual maximum and lifetime maximum needs to be removed, as the private drug plan needs to be at least as generous as the RAMQ.

(b) Describe how the provincial drug plans are funded in both jurisdictions (British Columbia and Quebec).

RAMQ:
- The plan is financed through general revenues of the province, employer tax and health premiums.
- The employer tax is payable to the Quebec Health Services Fund and the amount varies, from 2.7% to 4.26%, depending upon the employer’s total worldwide annual payroll.
- The contribution rate for employers whose payroll is less than $1M will progressively be reduced beginning in 2017. Certain employers may be eligible for a reduction in the contribution rate for small and medium-sized businesses in the primary and manufacturing sectors.
- Certain public-sector employers must pay a contribution of 4.26% regardless of their total payroll.
- Since January 1, 2013, a progressive health contribution was paid by each resident who is age 18 or older, the amount is determined on a sliding scale based on income, with a maximum contribution of $1,000.

BC PharmaCare:
- The BC PharmaCare plan is financed through general revenues of the province and Individual monthly Medical Services Plan (MSP) premium.
- Full premium assistance is available to those whose adjusted net income is less than $26,000, partial premium assistance available to shoes whose adjusted net income is up to $42,000.
- The MSP premium is scheduled to be eliminated effective January 1, 2020.

(c) Compare and contrast retirement and disability benefits between Quebec Pension Plan and Canada Pension Plan.
2. Continued

Retirement Benefits

For both CPP/QPP plans:

- A person who has made at least one valid contribution to CPP/QPP is eligible for a retirement pension.
- In general, the retirement pension replaces about 25% of the earnings on which the contributor paid into the CPP/QPP. The exact amount depends on how much, and for how long, the person contributed.
- Pension benefits are normally payable at age 65. However, a contributor may elect to receive a retirement pension as early as age 60 or as late as age 70. If either early or deferred retirement benefits are elected the amount of pension is reduced or increased between the date the benefits actually commence and age 65.
  - From 2012 to 2016, the government began gradually changing the early pension reduction from 0.5% to 0.6% for each month you receive it before age 65.
  - In 2017, an individual who started receiving their CPP/QPP at the age of 60 would receive 36% less than if they had taken it at age 65. (It is reduced by 0.6% for each month you receive it before age 65, i.e., 7.2% per year.) An individual who defers their pension after 65 will receive an increase of 0.7% (8.4% per year) for each month that they delay receiving it up to age 70.

Post-Retirement Benefit (PRB)

Those who receive a CPP/QPP retirement pension, and continue to work and make CPP/QPP contributions, are eligible for an additional PRB benefit. The PRB is a lifetime benefit that increases the contributor’s retirement pension and rises with increases in the cost of living, even for people who draw the maximum CPP/QPP pension. The PRB is automatically paid as of the January 1st following the year in which the person made contributions.

CPP Only:

- Pensionable earnings may be split equally between parties in case of divorce, separation or declaration of nullity if spouses cohabited for a minimum period.
- Spouses may share their pension if they are age 60 or over.

QPP Only:

- Phased retirement. Phased retirement refers to an arrangement in which an employee, between the ages 55 to 70, is working reduced hours, and thus receives reduced wages, while continuing to contribute to the plan as if they were working full-time. The employer must be agreeable to this arrangement and also continue to contribute to the QPP as if the salary had not been reduced.
2. Continued

Disability Benefits:

- QPP Only: If an employee, under age 65, becomes disabled and is prevented from engaging in any gainful occupation they may be eligible for QPP disability benefits. **The disability must be considered both severe and permanent.**
  - “Severe” means a state of health that prevents the employee from engaging in any gainful work that would pay him or her more than $16,029 in 2018.
  - “Permanent” means that the disability is likely to be of indefinite duration, without any possibility of improvement.

- QPP Only: However, an employee between the ages of 60 and 64 may be entitled to a disability pension if they are unable to perform their own occupation on a regular basis.

- CPP Only: If an employee becomes disabled and is prevented from engaging in any occupation, they may be eligible for CPP disability benefits. The disability, either physical or mental, **must be considered both severe and prolonged.** “Severe” means that the person’s condition prevents him or her from working regularly at any substantially gainful occupation. “Prolonged” means that the disability will prevent the employee from going back to work in the next 12 months, or is likely to result in death.

- CPP: In order to be eligible for benefits an employee must have contributed in at least 4 of the last 6 years prior to disability (3 of the last 6 years if the employee has contributed for 25 or more years).

- QPP: In order to the eligible for disability benefits under the QPP the person must have contributed in 2 of the last 3 years, in 5 of the last 10 years, or in half of the years in the contributory period, subject to a minimum of 2 years. A disabled person, age 60 to 65, must show that they recently worked, that is, that they contributed to the Plan for at least 4 of the last 6 years in their contributory period in order to be eligible for a disability benefit.
3. **Learning Objectives:**

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

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

**Learning Outcomes:**

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

(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.

**Sources:**

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

**Solution:**

(a) Describe why plan sponsors would choose to self-insure their Long Term Disability (LTD) claims.

There is often a perceived cost savings, due to the timing of costs.

- While Insured plans are required to setup reserves to cover the expected LTD cost in the future, self-insured plans are not required to do so, and many commonly pay out benefits as they arise from current cash flows which may give the perception of lower costs in any given year

- Some plan sponsors may feel they can earn a greater return by more aggressively investing the funds themselves, rather than turning them over to an insurer to fund a reserve

- In some provinces, the current tax regimes encourage ASO type plan by providing preferential tax treatment for such plans, this may drive certain plan sponsors to choose ASO over the insured option.

(b) Calculate Alice’s disabled life reserve as at January 1, 2019, including all retention charges. State your assumptions and show your work.

Payments are made at end of month. We can assume the reserve factor at duration 7 includes the first benefit payment. Namely, the reserve factor is at July 1, 2019, with the first payment made at July 31, 2019.
3. Continued

Monthly benefit = Gross salary x Income replacement /12 = 60,000 x 0.6 /12 = 3,000

Reserve factor for a female at age 40 and duration 7 is 83.6

DLR @ 2019/07/01 = 3,000 x 83.6 = 250,800

Expense factor = 1 + 6% + 2% = 1.08
(Alternatively, 1 x 1.06 x 1.02 is also accepted)

DLR @ 2019/07/01 with expenses = 250,800 x 1.08 = 270,864

DLR @ 2019/01/01 with expenses = 270,864 / 1.05^0.5 = 264,336

As the case study doesn't specify whether these reserve factors are at the
beginning, middle or end of the period, candidates may assume the reserve factors
are in the middle of the month (e.g. July 15, 2019) or end of the month (e.g. July
31, 2019), and discount properly to the beginning of the year.

(c) Calculate the gain/loss generated on Alice’s reserve due to this assumption
change at September 1, 2019. State your assumptions and show your work.

On September 1, 2019, the reserve factor should be based on age 40, duration 9.

Old reserve factor (age 40, duration 9) = 89.74
Old reserve @ 2019/09/01 = 3,000 x 89.74 = 269,220
Old reserve with expenses @ 2019/09/01 = 290,758

New reserve factor (age 40, duration 9) = 64.85
New reserve @ 2019/09/01 = 3,000 x 64.85 = 194,550
New reserve with expenses @ 2019/09/01 = 210,114

(Gain)/Loss = 210,114 – 290,758 = (80,644)

As the case study doesn't specify whether these reserve factors are at the
beginning, middle or end of the period, candidates may assume the reserve factors
are in the middle of the month or end of the month and discount properly.
4. **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.

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

**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)


**Solution:**

(a) Calculate the following performance measures for 2019. State the formula and show your work.

   (i) Total Asset Turnover

   (ii) Net Profit Margin

   (iii) Total Leverage Ratio

   (iv) Return on Equity

   a) Total Asset Turnover = Total Revenues / Total Assets
      = $19,448/$21,479
      = 0.905

   b) Net Profit Margin = Net Income / Total Revenues
      = $2,482/$19,448
      = 0.1276

   c) Total Assets / Equity or Fund Balance
      = $21,479/$11,427
      = 1.8797
4. Continued

d) Return on Equity = Total Leverage Ratio * Net profit Margin * Total Asset Turn over
= 1.8797*0.1276*0.905 =0.2171
Alternatively:
Net Income / Equity or Fund Balance
= $2,482/$11,427 = 0.2171

(b) Identify the characteristics of an insurance contract according to IFRS 17.

The main characteristics of an insurance contract according to IFRS 17 are for a contract covering:
1) Insurance risk
2) Material amount (significant)
3) For an uncertain future event
4) And that adversely affects the policy holder

(c) Identify which IFRS standards (IFRS 17, IFRS 9 and/or IFRS 15) would apply to the following types of insurance related contracts/components.

(i) Insurance Contract is valued under IFRS17
(ii) Distinct Service Component is valued under IFRS 15
(iii) Distinct Investment Component is valued under IFRS 9
(iv) Non-Distinct Investment Component is valued under IFRS 17
4. Continued

(d) Evaluate if each of the following is an insurance contract. Justify your response.

(i) An online smartphone website offers an option to its customers to pay $20 upon phone purchase for broken phone replacement in the first year (up to a value of $2,000).

(ii) A car dealership offers an option to its customers to pay $350 upon purchase of a new car for scheduled services in the first 3 years (regular price $450).

Recall from part b) must satisfy
1. Insurance risk
2. Material amount
3. Uncertain event
4. Adversely affect policyholder

(i) Yes: It is an insurance contract, with an uncertain event (of breaking phone), adversely affects policyholder (no phone). Arguable a "significant amount" at $200.

(ii) No: Certain event (will get car serviced), this is a discount ($350 vs. $450), and more of a perk than an insurable loss to the policyholder – does not adversely affect policyholder
5. **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:**
(5a) Describe the regulatory and policy making process in Canada.

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

**Sources:**
GHFV-647-15: Protecting Canadians’ Long Term Disability Benefits

**Solution:**
(a) Assume a discount rate of 0%.

(i) Calculate the “break-even” premium rate over the five-year experience period.

(ii) Calculate the cumulative savings to TeleHelp had it been paying the break-even premium rate over this period.

State your assumptions and show your work.

(i) Breakeven premium = total incurred claims = sum of paid claims + reserve @ Dec 31,2018 = 43,000 + 24,000 = 67,000

(ii) Total paid premiums = 88,000
Cumulative savings = 88,000 – 67,000 = 21,000

(b) Describe the regulatory framework for Canadian insurers as it relates to insured LTD benefits.

- All insurers in Canada are subject to prudential regulation from either the federal government, through OSFI, or one of the provincial regulators.

- Life and health insurers are also subject to comprehensive provincial market conduct regulation by the provinces in which they carry on business.

- Insurers are required to fund reserves for future benefit payments.

- Insurers are required to hold additional capital to support the guarantees embedded in the insurance contracts (MCCSR).
5. Continued

- In the highly unlikely event that the insurance company were to become bankrupt, insured benefits would continue to be protected by Assuris which provides income replacement benefits of up to $2,000 or 85% of monthly benefits, whichever is greater.

- Insurance industry regulatory framework provides consumers with recourse to ensure proper access to a claim review when needed through OHLI.

- None of the above protections apply where plan sponsors provide LTD benefits on an uninsured ASO basis.

(c) Describe the Canadian Life and Health Insurance Association’s policy solutions for protecting employees on LTD.

1. Enhanced disclosure requirements:
   - May help Canadians with uninsured plans better understand that their LTD plans are not insured, as well as the implications for their financial security. It is important to note that in the case of LTD plans, disclosure does not address the fundamental issue of protecting LTD payments when plan sponsors become insolvent or bankrupt.

2. Increased priority status of disabled employees during bankruptcy:
   - Such an approach would increase the likelihood that disabled employees get access to any available funds in a bankruptcy proceeding. However, it does not address the fundamental issue of protecting LTD payments, as it does not ensure that there are in fact funds available in the event of an employer’s bankruptcy.

   - Changing the established creditor rankings in bankruptcy would distort the credit and bond market in Canada and would likely increase capital funding and borrowing costs for plan sponsors with ASO plans.

3. Require plan sponsors to establish reserves under a separate disability fund:
   - Requiring the plan sponsor to establish reserves under a separate disability fund with substantially the same actuarial requirements as insured plans would meaningfully improve the protection of LTD payments over the status quo. To be effective such a fund would need to be protected from other creditors.

4. Require that LTD plans be offered on an insured basis.
5. Continued

(d) Evaluate each of the solutions in part (c) from the perspective of TeleHelp. Justify your response.

1. Enhanced disclosure requirements: This would meet TeleHelp’s objectives

2. Increased priority status of disabled employees during bankruptcy: This may meet TeleHelp’s objectives depending on the impact on funding/borrowing costs.

3. Require plan sponsors to establish reserves under a separate disability fund: This does not meet TeleHelp’s objectives because presumably “substantially the same actuarial requirements as insured plans” would result in similar costs as are currently being paid to the insurer.

4. Require that LTD plans be offered on an insured basis: This is the current approach and does not meet TeleHelp’s objectives.
6. **Learning Objectives:**

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

**Learning Outcomes:**

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

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

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

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

**Solution:**

(a) Calculate the defined benefit obligation for Joe’s sick leave benefit at December 31, 2020, assuming Whitlock reports under IAS 19. State your assumptions and show your work.

<table>
<thead>
<tr>
<th>Age</th>
<th>Projected Bank Balance</th>
<th>Projected Hourly Rate of Pay</th>
<th>Payout of sick leave</th>
<th>Probability of retiring at this age</th>
<th>Discounting</th>
<th>P.V. of future benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>1,800</td>
<td>62.81</td>
<td>28,264.50</td>
<td>3.017%</td>
<td>37.5%</td>
<td>$319.91</td>
</tr>
<tr>
<td>61</td>
<td>1,860</td>
<td>64.70</td>
<td>30,085.50</td>
<td>2.866%</td>
<td>36.1%</td>
<td>$311.05</td>
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<tr>
<td>62</td>
<td>1,920</td>
<td>66.64</td>
<td>31,987.20</td>
<td>2.723%</td>
<td>34.7%</td>
<td>$302.10</td>
</tr>
<tr>
<td>63</td>
<td>1,980</td>
<td>68.64</td>
<td>33,976.80</td>
<td>51.740%</td>
<td>33.3%</td>
<td><strong>$5,862.35</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>$6,795.41</strong></td>
</tr>
</tbody>
</table>

Joe's Current Age (years): 35.0
Joe's Current Service (years): 5.0
Current Sick bank (hours): 300
Future Rate of Accumulation (hours/year): 60

Full eligibility criteria: Age 60 with 10 years of service
Therefore, Joe will fulfill this (i.e. become fully eligible) at age 60

To calculate the DBO, we need to first calculate the present value of future benefits:
6.  Continued

The attribution period is from date of hire to full eligibility age (60): 30

DBO at 12/31/2020:  (Current Service/Attribution Period) x (PV of Future Benefits)
(5/30) x ($6,795.41) = $1,132.57

(b) Calculate the current service cost and interest expense for the year 2021. State your assumptions and show your work.

Current Service Cost = P.V. of Benefit / Attribution Period
Current Service Cost = $226.51

Interest Expense = \( i_{\text{rate}} \times \left[ \text{DBO}_{\text{boy}} + \text{Current Service Cost} - \text{Benefit Payments} / 2 \right] \)
Benefit Payment for 2021 = $0
Interest Expense = $54.36
7. Learning Objectives:
4. The candidate will understand how to prepare and be able to interpret insurance company financial statements in accordance with IFRS & IAS.

Learning Outcomes:
(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-683-17: CIA Educational Note Dynamic Capital Adequacy Testing

Solution:
(a) Describe the purpose of the Dynamic Capital Adequacy Test (DCAT) process.

DCAT process allows the Appointed Actuary:
• to inform the insurer's management about the implications that the business plan has on capital
• provide guidance on the significant risks to which the insurer will be exposed
• identity possible threats to the financial condition of the insurer
• trigger appropriate risk management or corrective actions to address those threats.

(b) List the key elements in a comprehensive DCAT report.

The main components are as follows:
(Note: must have the following 4 components for full marks)
• DCAT Opinion
• Capital Adequacy Measurement
• Base Scenario
• Adverse Scenarios

Additional components of the DCAT report are:
(Note: 4 marks for listing items from the remaining list - any four of the following)
• Executive Summary
• Background Discussion
• Introduction
• Conclusions and Recommendations
• Appendices
7. Continued

(c) Compare and contrast the potential causes and ripple effects for persistency/lapse risk and morbidity risk.

**Similarities in Causes**
- Misestimation of expected experience due to a lack of credible experience data
- Insurance environment changes
  - Retrenchment of government social security programs (under morbidity section)
  - Changes in sales distribution system; (under lapse section)
- Health/external views of insurance company
  - Court rulings in favor of the policyholder that limit the insurer’s ability to adjudicate claims;
  - A sudden lack of confidence in the company that may be caused by a sudden downgrade by external rating agencies, combined with extensive publicity

**Differences in Causes**
(any two of the following)
- Causes of adverse morbidity include:
  - A prolonged high-unemployment recessionary environment leading to both sharply increased incidence rates and low claim termination rates for disability
  - An increase in incidence rates without increasing death rates (for example, in the case of non-life-threatening epidemic, or accident rates), or increased rates of diagnosis of critical illness as a result of sensitive diagnostic technologies
  - Improved treatment for diseases, such as AIDS, that decrease both recovery rates and death rates for disabled lives and survival period rates for critical illness insurance
  - Escalation in dental and medical costs

(any two of the following)
- Causes of adverse persistency and lapse include:
  - Premium changes, including amount and payment pattern
  - Dividend scale changes
  - Changes in distribution system
  - A new product introduced to the market by a competitor
  - Changes in underwriting and/or qualification criteria for preferred/select classes
  - Changes in premium rates in the market
7. Continued

Similarities in Ripple Effects
- Decreased future profits/new business
  o (due to morbidity) Adverse publicity/reputation damage arising from claim or underwriting practices associated with health/disability/sickness insurance, leading to decreased sales of new business
  o (due to lapse/persistency) Reduction in company’s new business while, at the same time, the company could not proportionately reduce its expenses

Differences in Ripple Effects
(any two of the following)
- Ripple effects for morbidity risk could include:
  o Constraints to rate increases as the industry reacts slowly in implementing renewal rate increases
  o Rate guarantees that limit or delay required rate increases
  o Increases in antiselective lapses that may dampen—or nullify—the intended effect of rate increases

(any three of the following)
- Ripple effects for persistency and lapse risk could include:
  o Worsened mortality or morbidity, which may be caused by antiselection
  o Mismatch of asset and liability cash flows
  o Increased unit expenses
  o Worsened liquidity risk (for example, a “run on the bank” situation)
  o Inability to borrow any external capital or debt and/or nonrenewal of existing borrowings at maturity
  o Changes in the expected mix of business
8. **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:**
(5a) Describe the regulatory and policy making process in Canada.

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

**Sources:**
GHFV-637-13: Ch. 16 and 17 of Canadian Life & Health Insurance Law, Jones, H. E. (Pages 321, 352 and 355)

**Solution:**
(a) The first application is from Audrey.

Describe considerations in determining the premium rate for this application.

Audrey is an individual, therefore premiums are determined based on:

- Age/gender of life insured
- Type of coverage
- Amount of coverage

(b) The second application is from Elliot, Dean, and Glen. All are varsity rock climbers who have been unable to obtain individual insurance, so they have decided to apply as a group for life insurance coverage.

Outline your response to this application.

This application should be rejected, because:

- The group appears to have been formed solely for the purpose of obtaining insurance.

(c) The third application is from the photography club, which would like to offer its members travel medical insurance as part of the annual membership fee. You have agreed to accept this application and are in the process of drafting the contract.

(i) List and describe the prerequisites for the formation of a valid, informal contract.

(ii) List and describe standard provisions that are unique to health insurance policies.
8. Continued

(i) • One party must accept unconditionally the other party’s offer to contract ("mutual assent")
• The contract must be supported by adequate consideration (usually applicant’s completion of application and payment of initial premium)
• The parties must have contractual capacity
• The contract must have a lawful object (for individual insurance, this is met through insurable interest; group insurance policies are excluded from the insurable interest requirement)

(ii) • Eligibility provisions
  o Define which members of the group are eligible for coverage under the group policy
• Termination of the policy
  o Defines an insurer’s right to refuse to renew the policy or cancel the coverage under an individual policy; defines an insurer’s rights and liabilities to provide continued coverage when a group policy is terminated
• Pre-existing conditions provisions
  o Included in most group health insurance policies and some individual health policies in order to reduce anti-selection; the provision describes which conditions are considered to be pre-existing and, therefore, not covered under the policy
• Physical examination provision
  o Grants the insurer the right to have a claimant examined by a doctor of the insurer’s choice, at the insurer’s expense
• COB provision
  o Included in group policies in order to define the plan that is the primary provider of benefits when the group insured has duplicate medical expense coverage
• Change in occupation provision
  o Included in many individual disability income policies; the provision allows the insurer to adjust the premium rate or maximum benefit amount in order to reflect a change in the person insured’s occupational hazards after the policy is issued
• Over-insurance provision
  o Included in some individual health insurance policies; the provision prevents an insured who has duplicate insurance coverage from profiting from sickness, injury, or disability
9. 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.
(3c) Compare social programs in Canada and the United States and discuss the value of the different systems.
(5b) Describe the major applicable laws and regulations and evaluate their impact.

Sources:
Morneau Shepell Handbook of Canadian Pension and Benefit Plans, 16th Edition
GHFV-672-16: CHLIA Guideline G17 – Coordination of Benefits for Out-of-Country/Out-of-Province/Territory Medical Expenses

Solution:
(a) Compare and contrast eligibility requirements for each of the Canadian and US government healthcare programs.

US - Medicare
- Medicare covers most persons over 65 years of age, some disabled individuals under 65, and most individuals with end-stage renal disease (ESRD).

US - Medicaid
- The “categorically eligible” groups include children, parents or other caretakers with dependent children, pregnant women, individuals with disabilities, and seniors.
- In addition to categorical requirements, certain income and asset requirements must be met. Income requirements are defined as a percentage of the federal poverty level (FPL).
9. Continued

Canada

- All eligible residents must be covered for insured health services, based on the “universality” condition in the Canada Health Act.

(b) List key services covered under each part of US Medicare.

Part A (Hospital Coverage)
(any four of the following)

- Inpatient hospital care
- Inpatient stays in most skilled nursing facilities
- Hospice and home health services
- Inpatient hospital benefits cover semi-private room and ancillary services and supplies.
- Skilled nursing facility benefits cover semi-private room, meals, skilled nursing and rehabilitative services, and other services and supplies after a related three-day inpatient hospital stay.
- Home health agency benefits generally cover services following discharge from a hospital or skilled nursing facility.
  Hospice care is provided to terminally ill patients with life expectancies less than six months.

Part B (Medical Coverage)
(any four of the following)

- Doctor and clinical lab services
- Outpatient and preventive care
- Home health care
- Screenings, surgical fees and supplies
- Physical and occupational therapy
- Outpatient hospital (includes services such as emergency room and outpatient surgery);
- Medical care (covers services provided by physicians and other qualified health practitioners. Also covers cost of diagnostic tests, supplies, durable medical equipment, prosthetic devices, and ambulatory surgical center fees);
- An initial preventive visit within 12 months of enrolling in Part B and yearly wellness visits thereafter;
- Ambulance services;
- Clinical laboratory and radiology services;
- Physical and occupational therapy services;
- Speech pathology services;
- Outpatient rehabilitation, including partial hospitalization services;
- Radiation therapy services;
- Transplants;
9. Continued

- Dialysis;
- Home health care beyond that covered by Part A;
- Certain drugs and biologicals (SMI only covers those that cannot be self-administered, except certain cancer drugs);
- Certain preventive services (largely with no cost sharing), including an annual flu shot, bone mass measurement, colorectal cancer screening, diabetes services, mammogram screening, Pap test, pelvic exam, prostate cancer screening, and certain vaccinations.

Part C (Medicare Advantage)
- Medicare Advantage plans (also known as MA plans or Part C plans) are also available as an option that substitutes for HI and SMI coverage in many locations.
- MA plans typically offer lower out-of-pocket costs, including a limit on out-of-pocket expenses, increased coverage limits, and coverage for some services and items that would not be covered under traditional Medicare, such as eyeglasses, hearing aids, dental care, and non-emergency transportation.

Part D
- Prescription Drugs

(c) Sketch a flow chart of the claims process for a covered individual that has coverage under more than one plan in Canada.

Commentary on Question:
This question and the solution below were intended to test the claims process for an out-of-country claim. However, this was not explicitly stated and could have been interpreted as an in-province claim instead of an out-of-country claim. Full marks were also given to candidates if they correctly sketched a flow chart of the claims process for an in-province claim.
(d) Describe specific considerations and exceptions for determining the amount payable for a covered individual that has OOC coverage under more than one plan in Canada.

- In general, where there is more than one Primary Plan, each of the Primary Plans will pay an equal share of eligible expenses, subject to deductibles or limitations.
- Similarly, where there is more than one Secondary Plan, each of the Secondary Plans will pay an equal share of excess eligible expenses not covered by the Primary Plans, subject to deductibles or limitations.
- Where a portion of the claim is not covered by any of the Primary or Secondary Plans due to exclusions or limitations, the Covered Individual is responsible for this amount.

**Exceptions for Group Plan Retirees**
This exception relates to extended health coverage for retirees.
- Where a group retiree plan has a lifetime limit of $50,000 or less, this group retiree plan will always be secondary to other plan coverage without a lifetime limit, to avoid eroding this benefit.
- Where the group retiree plan provides for a lifetime limit in excess of $50,000, coordination of benefits will only be done for amounts of the lifetime limit remaining that are in excess of $50,000.
9. Continued

- If the Covered Individual is deceased, this limit no longer needs preserving, unless it extends to a survivor. Therefore, full coordination will apply to the entire retiree coverage.
- If the claimant has already used up all other coverage sources, the group retiree coverage will be responsible for any remaining expenses covered under the retiree plan.

(e) Describe factors that Erin should consider in deciding whether or not to purchase individual insurance after her move.

- Her health: Her health is certainly a factor in determining what level of coverage she should have.
- Social Security eligibility: If she doesn’t qualify for Medicare/Medicaid then she would certainly need individual insurance.
- Private plan coverage limitations: Her current private plan has out of country limits of $50,000 but generally this has trip length limitations and she would not be covered should she move to another country like the US. She should understand exactly what coverage she has before looking into buying additional individual insurance.
- Her financial situation: Is she able to bear the financial burden of self-insuring the risk?
- Her family: Additional cost if she also has an aging spouse but also any potential coverage she might have under her spouse's plan.