RET 301 Model Solutions
March 2026

1. Learning Objectives:

1. The candidate will understand how to analyze/synthesize the factors that go into selection of actuarial assumptions for funding purposes of retirement plans under Canadian pension legislation, regulatory policies, tax legislation, and actuarial standards of practice.

Learning Outcomes:

(1a) Describe and apply appropriate techniques used in the development of assumptions for funding purposes.

(1b) Evaluate and recommend appropriate assumptions for funding purposes.

(1c) Evaluate actual experience, including comparisons to assumptions.

Sources:

Determination of Best Estimate Discount Rates for Going Concern Funding Valuations, CIA Educational Note, Apr 2023 [a. and b.]

Expenses in Funding Valuations for Pension Plans, CIA Revised Educational Note, Jun 2023 [a. and b.]

Commentary on Question:

The question assessed candidates' understanding of setting the best estimate discount rate for a going concern valuation, as well as approaches for reflecting plan administration-related expenses. It also tested their ability to explain the considerations involved in setting the going concern discount rate under a glide-path strategy. Overall, candidates performed well; however, some had difficulty clearly articulating the considerations related to the discount rate under the glide-path approach.

Solution:

(a) Compare and contrast the following two approaches used for the selection of a best estimate discount rate for a going concern valuation.

(i) Expected future investment returns

(ii) Yield of investment grade debt securities

1. Continued

Both are acceptable approaches. They have the same purpose but are appropriate based on the particular situation of the plan.

i. **Discount rate based on the expected future investment return on the assets of the pension plan**	ii. **Discount rate based on the yields of investment grade debt securities which would reasonably match projected benefit cash flows, with an appropriately low level of risk, regardless of the plan's assets.**

• Set based on expected future investment return of the plan assets.
• The best estimate discount rate assumption is expected to be unbiased using this approach.
• The actuary may wish to consider how investment returns may be affected by the life expectancy of the plan.
• An actuary can use a building block approach consisting of:
  ○ determining the best estimate of long-term, expected future investment returns for various asset classes;
  ○ combining the best estimate long-term, expected future investment returns for different asset classes to reflect a plan's investment policy with consideration of the effects of diversification and rebalancing;
  ○ considering inclusion of an allowance for additional return due to active versus passive management, where appropriate; and
  ○ making appropriate provision for expenses
  ○ Generally, when following such an approach, there is a range of reasonable assumptions for each component of the model. In determining an overall best estimate assumption, it would not be appropriate to select the most optimistic (or most pessimistic) point of the range for each component assumption.
  ○ If using a stochastic methodology, it would
	• Not set based on plan assets
	• Typically reflects the yields on Government of Canada, or other high-quality bonds, that would reasonably match projected benefit cash flows or have a duration comparable to that of the projected benefit cash flows.
	• Select and ultimate rates may be used to approximate the effect of using a full yield curve.
	• For a plan where an immunized portfolio of fixed income investments is established to match projected benefit cash flows, it may be appropriate to base the discount rate assumption on the yield on the immunized portfolio.
	• If the fixed income investments mature prior to the expected payment of all projected benefit cash flows, the actuary would consider making an allowance for reinvestment and the effect of possible changes in interest rates on future investments.

	incorporate probability distribution of long-term investment returns by asset class, standard deviations on each asset classes and correlations between investment returns on different asset classes. The best estimate asset return assumption to be used would normally be based on a percentile at or near the median of the distribution of long-term investment returns of the portfolio.	

(b) Describe four considerations when assessing the appropriateness of assuming added value from active management in the best estimate discount rate.

Providing four of the items below or any other relevant considerations was sufficient to earn full marks.

Considerations:

- Insufficient relevant supporting analysis – Added value assumptions must be supported by consistent and reliable additional returns earned over the long term based on both historical and future considerations.
- Historical outperformance is not sufficient – Even strong past performance does not, by itself, justify future assumptions.
- Reliability of investment manager performance – Assumptions should be based on robust attribution of success to consistent factors. Assessment should consider the extent to which past performance and expected future performance can be attributed to particular manager's organization, people, and investment processes based on appropriate professional experience.
- Organizational changes – Changes in people, process, or structure at the investment firm may affect future performance reliability.
- Governance in place – Oversight in hiring, monitoring, or replacing managers is another consideration.
- Bias in historical analysis – The actuary would consider periods of both positive and negative incremental returns due to active management when assessing historical experience and future expectations.

1. Continued

(c) Describe the two approaches for reflecting plan administration-related expenses in a going concern valuation.

1. **Reduction in the discount rate:**
   A reduction in the discount rate results in an increase in both the Accrued Actuarial Liability and Future Normal Cost. The increase in the Accrued Actuarial Liability implicitly results in a provision for future expenses associated with accrued benefits. The increase in the Future Normal Actuarial Costs implicitly results in a provision for future expenses associated with benefits expected to accrue in future periods.

2. **Explicit allowance in the normal actuarial cost:**
   This type of allowance represents a short-term assumption that is assumed to apply until the completion of the next actuarial valuation. Where expenses are expected to be non-uniform over the period until the next valuation is filed, the annual allowance may be based on the average expected expense over the period.

(d) You are the actuary for a mature, closed defined benefit pension plan.

Recommend an approach for reflecting plan administration-related expenses in a going concern valuation for this plan.

Justify your answer.

An actuary would need to consider important factors as follows:

- For all expenses, the actuary should take into account the evolution of future expenses in relation to the size of assets and liabilities. In particular, as a closed plan is maturing, the assets and liabilities may eventually start to decrease. Over time, expected fees may increase as a percentage of remaining assets as the administrator may no longer benefit from economies of scale from a larger asset base. Also, non-asset related expenses may have a fixed-dollar component and not reduce as quickly as the rate of reduction in plan liabilities.
- The reduction in the discount rate approach applies to all future years and it will increase or decrease over time in conjunction with the growth or decline in the plan's liabilities. For pension plans that are expected to be approximately fully funded at any given time, this approach lends itself very well to asset-related expenses such as investment management fees, brokerages fees, and certain custodial, trustee and consultant fees that naturally move up or down in relation to the size of the underlying assets.

1. Continued

- For other expenses where the relationship between the size of the fund and the expense levels is less robust, the actuary needs to be cognizant of the bias potentially being introduced where the size of the fund is expected to increase or decrease considerably over time. For this reason, care would be exercised if using this approach for non-asset-related expenses and explicit allowance is likely better suited for these expenses.

Recommendation:

- Because of the reasons cited above, it is therefore preferable in the case of a closed plan to separately identify and clearly explain the allowance included for administration expenses. In other words, it is preferable to have an explicit assumption in place instead of a reduction in the discount rate given that expenses may no longer be in line with the decreasing plan liabilities.

(e) Explain the considerations in setting the going concern discount rate under the glide-path strategy.

Considerations:

- The actuary may, but is not required to, reflect information for expected changes to the plan's target asset mix after the calculation date.
- May reflect the anticipated timing and effect of future changes in asset mix on the expected future investment return on the plan's assets based on certain variables such as funded status, interest rate level, or other applicable variables.
- Where adjustments are made to reflect a glide path and the timing of the change is dependent on variables such as the funded status of the pension plan, interest rate levels etc., assumptions are made as to how these variables will evolve over time. The assumptions would be consistent with the economic basis for setting the expected returns, regulatory funding requirements, and, where applicable, the plan's funding policy.
- In determining the diversification effect where changes over time in the target asset allocation are reflected in the determination of the best estimate discount rate, must be mindful of the impact on the diversification effect of changes to the asset mix that are scheduled to occur, or expected to be triggered, after the calculation date.

2. Learning Objectives:

4. The candidate will understand how to apply the Canadian pension legislation, regulatory policies, and tax legislation in the context of pension plan funding.

Learning Outcomes:

(4b) Evaluate funding restrictions imposed by regulations

Sources:

RET301-103-25: R.R.O. 1990, Reg 909: General Regulations under Ontario Pension Benefits Act (Legislation in this note pertaining to JSPP & MEPP and historical funding relief is background only)

RET301-104-25: R.S.O. 1990, Ch. P.8 under Ontario Pension Benefits Act (Legislation in this note pertaining to JSPP & MEPP and historical funding relief is background only)

Canadian Pensions and Retirement Income Planning, Willis Towers Watson, 6th Edition Ch. 15, 23

Morneau Shepell Handbook of Canadian Pension and Benefit Plans – Ch. 8, 13

Commentary on Question:

This question tested candidates' ability to determine contribution requirements in accordance with the Pension Benefits Act (Ontario) and the Income Tax Act (Canada).

Solution:

(a) Calculate the minimum required and maximum permissible employer contributions in 2025.

Commentary on Question:

Candidates received full marks if they correctly calculated both the minimum required and maximum permissible contributions for 2025.

Given the one-year deferral of the new stream of special payments, candidates did not receive full marks if these payments were included in the 2025 minimum required contribution, as they begin in 2026.

Overall, most candidates correctly calculated the maximum permissible contributions by determining the greater of the going concern unfunded liability and the hypothetical wind-up deficit, plus employer current service cost (including provision for administrative expenses and PfAD)

See excel spreadsheet for solution

2. Continued

(b) Calculate the minimum required employer contributions in 2026 based on the December 31, 2024 valuation results.

Commentary on Question:
Candidates performed less strongly in part (b) if the new stream of special payments were not determined correctly.

To determine the going concern special payments, candidates were expected to consolidate and reset the schedule, incorporating the one-year deferral for the new stream.

To determine the solvency special payments, candidates were expected to determine a new stream without resetting or consolidating the existing schedule and reflect the one-year deferral of the new stream of payments.

See excel spreadsheet for solution.

3. Learning Objectives:

3. The candidate will understand how to evaluate and apply Canadian pension legislation, regulatory policies, and tax legislation for registered retirement plans.

Learning Outcomes:

(3b) Describe and apply Canadian pension legislation, regulatory policies and tax regulation pertaining to:

- Plan design
- Plan establishment
- Members' rights
- Contributions and benefits
- Plan amendment
- Plan termination/wind-up
- Plan merger or spin-off
- Reporting requirements
- Individual savings plans

Sources:

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

- Ch. 5 – Design, Registration, and Administration of Pension Plans
- Ch. 8 – Registration of Pension Plans Under the Income Tax Act and Taxation of Retirement Savings

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Calculate the lifetime and bridge pensions payable from the pension plan as at December 1, 2025 under the normal form for both Member A and Member B.

Show all work.

Commentary on Question: *This part was generally well answered, but some candidates did not apply the combined lifetime and bridge benefit limit correctly.*

See Excel spreadsheet for solution

(b) Calculate the maximum amount Member A is able to transfer to their Locked-In Retirement Account.

Show all work.

3. Continued

Commentary on Question:
This part of the question was poorly answered. Candidates often forgot to roll forward the CV to the transfer date and correctly interpolate the factors.

See Excel spreadsheet for solution

4. Learning Objectives:

2. The candidate will understand how to prepare valuation results, including required contributions, for various purposes under Canadian pension legislation, regulatory policies, tax legislation, and actuarial standards of practice.

3. The candidate will understand how to evaluate and apply Canadian pension legislation, regulatory policies, and tax legislation for registered retirement plans.

Learning Outcomes:

(2d) Prepare valuation results for special purposes, including plan terminations, plan mergers or spin-off, actuarial equivalence calculations and asset transfers

(3b) Describe and apply Canadian pension legislation, regulatory policies and tax regulation pertaining to:

- Plan design
- Plan establishment
- Members' rights
- Contributions and benefits
- Plan amendment
- Plan termination/wind-up
- Plan merger or spin-off
- Reporting requirements
- Individual savings plans

Sources:

- CIA Consolidated Standards of Practice, sections 3100-3500 [all outcomes]

- Canadian Pensions and Retirement Income Planning, Willis Towers Watson, 6th Edition, 2017
    - Ch. 1 (section 105, sections 120-145) [a.]
    - Ch. 2-3 [a. and b.iv.]
    - Ch. 5-12 [b.iv.]
    - Ch. 14 [b.ix.]
    - Ch. 16-23 [b.]

Commentary on Question:

The question tested candidates' ability to correctly calculate accrued benefits, including the proper application of the ITA early retirement reductions. It also assessed their understanding of how to determine the commuted value (CV) and CV rates. While most candidates performed well in calculating the accrued benefit and the CV rates, many incorrectly assumed grow-in when applying the ITA reduction to the benefit. Performance was weaker when calculating the corresponding commuted value at termination.

4. Continued

Solution:

(a) Calculate the monthly pension payable from the pension plan assuming immediate retirement.

See Excel spreadsheet for solution.

(b) Calculate the interest rates used to determine the commuted value in accordance with the CIA Standards of Practice, Section 3500.

See Excel spreadsheet for solution.

(c) Calculate the commuted value as at the member's termination date.

Commentary on part (c):
Solutions that assumed annuity factors were immediate or deferred were both accepted.

See Excel spreadsheet for solution.

5. Learning Objectives:

2. The candidate will understand how to prepare valuation results, including required contributions, for various purposes under Canadian pension legislation, regulatory policies, tax legislation, and actuarial standards of practice.

Learning Outcomes:

(2a) Differentiate between various purposes for valuing pension plans, including:

- Going concern funding
- Solvency and hypothetical wind-up
- Termination/wind-up

(2b) Analyze a variety of asset valuation methods appropriate for regulatory purposes

(2c) Prepare valuation results for ongoing plans appropriate for regulatory purposes

(2d) Prepare valuation results for special purposes, including plan terminations, plan mergers or spin-off, actuarial equivalence calculations and asset transfers

Sources:

Calculation of Incremental Cost on a Hypothetical Wind-Up or Solvency Basis, CIA Educational Note, Apr 2023 [a.ii. and c.]

CIA Consolidated Standards of Practice, section 1000-1700 [all outcomes]

CIA Consolidated Standards of Practice, sections 3100-3500 [all outcomes]

Section 3500 of the Practice-Specific Standards for Pension Plans – Pension Commuted Values (Subsection 3570), CIA Educational Note, May 2023 [d.]

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Compare and contrast the solvency incremental cost (SIC) and the going concern normal cost (NC).

Commentary on Question:

This part of the question was answered well by most candidates. Candidates received full marks if they clearly differentiated points of similarity and difference.

5. Continued

Normal Cost definition:

the actuarial present value of the benefits accruing to members during a plan year, determined using a going concern valuation basis

Solvency increment cost definition:

The incremental cost on a solvency basis represents the present value, at the calculation date (time 0), of the expected aggregate change in the solvency liability between time 0 and the next calculation date (time t), adjusted upwards for expected benefit payments between time 0 and time t.

Similarities between NC and SIC:

- Both represent the cost of accruing benefits over the plan year for active members and are essential to determining whether a plan is adequately funded

Key differences between NC and SIC:

- NC represents change in liability due to service rendered during period.
- SIC represents the expected change in liability due to all factors, other than expected benefit payments.
- NC does not include ad-hoc indexing at the next valuation date, while SIC includes it.
- The SIC should include the effect of a pending amendment to the pension plan, full impact of grow-in benefits for members reached grow-in eligibility, and for members become entitled to subsidized early retirement.
- NC is primarily used for funding purposes, affects the plan contributions.
- The SIC is used for disclosure purposes, CIA Standards of Practice require it to be included in the external user funding reports that contain a solvency valuation. The SIC is also used for projecting solvency liability.

The interest rate used to calculate the normal cost may reflect the expected return on the pension plan's assets, while the SIC calculation is independent of the expected return on plan assets, SIC calculation is using the prescribed commuted value and annuity purchase rates at time 0.

You are the actuary of three Ontario registered defined pension plans with benefits based on final average earnings.

5. Continued

(a) Identify which plan(s) would have a SIC greater than zero. Justify your answer.

Commentary on Question:
This part was also well done by most candidates.

Plan A (freeze credited service): Yes, Plan A has a SIC.

Reason: Future service freezes but future salary increases continued, the SIC calculation includes the projection of earnings to time t. Therefore, future salary increase impact the solvency liability, resulting in a SIC.

Plan B (freeze credited service and FAE): No, Plan B does not have a SIC.

Reason: There are no future salary increase or service accruals. Since there are no change in liability due to salary or service accruals and no expected decrement and status changes, there is no SIC for Plan.

Plan C (active will be eligible for subsidized early retirement). Yes, Plan C has a SIC

Reason: Active members become entitled to subsidized early retirement during the calculation period will increase in the solvency liability and resulting in a SIC. Involuntarily terminated Ontario members with fifty-five points is eligible for grow in benefits, which also results a SIC.

(c) Describe the methodology and assumptions required to calculate the SIC for each of the plans with a SIC greater than zero.

Commentary on Question:
Candidates were able to describe most of the methodology and assumptions but were not able to do so completely.

Calculation methodology:

Calculate the present value at January 1, 2025 (time 0) of expected benefit payments from January 1, 2025 (time 0) to January 1, 2028 (time t).

PLUS

Project the solvency liability at time t discounted to time 0, reflecting the following:

1. Expected decrements and changes in status between time 0 and t
2. Accrual of service to time t
3. Expected change in benefits to time t (negotiated increase in flat benefit formula, ad hoc retiree benefit increase, increase in ITA max benefit limit etc.)

5. Continued

4. Projection of earnings to time t

LESS

Solvency liability at time 0

Assumptions for SIC Calculation:

The assumptions for projected benefit payments, decrements, service accruals, expected benefit changes and increase in pensionable earnings would usually be consistent with the going concern valuation.

At time t, the projected solvency liability is determined using the same economic assumption as at time 0. However, if different components of the solvency liability are determined using different discount rates (e.g., liability expected to be settled by commuted value using commuted value rates, liabilities expected to be settled by annuity purchase using annuity purchase rates).

(d) Calculate the SIC for the three-year inter-valuation period.

Commentary on Question:
Candidate performance was mixed on part (d). The most common mistakes involved incorrect assumptions for projection or discounting.

See Excel spreadsheet for solution.

6. Learning Objectives:

3. The candidate will understand how to evaluate and apply Canadian pension legislation, regulatory policies, and tax legislation for registered retirement plans.

4. The candidate will understand how to apply the Canadian pension legislation, regulatory policies, and tax legislation in the context of pension plan funding.

Learning Outcomes:

(3b) Describe and apply Canadian pension legislation, regulatory policies and tax regulation pertaining to:

- Plan design
- Plan establishment
- Members' rights
- Contributions and benefits
- Plan amendment
- Plan termination/wind-up
- Plan merger or spin-off
- Reporting requirements
- Individual savings plans

(4b) Evaluate funding restrictions imposed by regulations

Sources:

Canadian Pensions and Retirement Income Planning, Willis Towers Watson, 6th Edition, 2017 [all outcomes]

- Ch. 15 (excluding Section 1525)
- Ch. 23

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

- Ch. 13 [all outcomes]

RET301-103-25: R.R.O. 1990, Reg 909: General Regulations under Ontario Pension Benefits Act

RET301-104-25: R.S.O. 1990, Ch. P.8 under Ontario Pension Benefits Act

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe the legislative requirements for implementing a plan amendment that improves member benefits.

6. Continued

Commentary on Question:
This question was generally poorly answered. Candidates either didn't mention notice to plan members or cost certificate filing.

1. Notice to plan members of the plan amendment

2. File the plan amendment with FSRA and CRA within 60 days after the amendment was approved

3. File a plan amendment cost certificate:

    - A cost certificate generally must be filed when a plan is amended to improve benefits and the amendment increases contributions or increases the going concern unfunded liability or solvency deficiency.

    - The cost certificate must be filed with FSRA (and CRA) within six months following the date the amendment is required to be filed.

    - The cost certificate must contain:

        i. The information required in a funding valuation report that might be affected by the amendment, including but not limited to:
            - Impact on going concern and solvency liabilities (past service cost)
            - Impact on normal cost
            - The plan's going concern and solvency funded ratios on the date the amendment is effective.
        ii. The available actuarial surplus used to fund the benefit improvement
        iii. A description of the lump sum benefit improvement contribution, if any.
        iv. The maximum permitted contributions, taking into account benefit improvement and level of surplus.
        v. If the going concern funded ratio and the solvency ratio after reflecting the plan amendment are above 80%, the amendment is not considered to be void

4. Should there not be sufficient surplus, remit any required lump sum benefit improvement contribution to the plan within 60 days of filing the cost certificate and revise normal cost contributions in accordance with the cost certificate

6. Continued

(b) Describe the legislative requirements for taking a contribution holiday.

Commentary on Question:
This question was generally poorly answered. Candidates did not provide sufficient detail on the cost certificate requirements.

1. Filing or certification requirements

   - Actuary must file a funding valuation or cost certificate to justify taking a contribution holiday. In a year where there is not a full valuation, need to file a cost certificate effective January 1 filed within the first 90 days of the fiscal year to support a contribution holiday
   - The funding valuation or cost certificate must confirm that there is enough available actuarial surplus to take (or continue taking) a contribution holiday)

2. How available surplus is measured for this purpose

   - Must be calculated as of full funding valuation date or subsequent cost certificate date (Jan 1 of each calendar year for cost certificate)
   - Account for benefit improvement impact on funded positions and normal cost
   - Account for data roll-forward estimation error margin
   - There is available actuarial surplus (AAS) at a given date if:
     - 1. GC position after PfAD is at least 100%, and
     - 2. Solvency position is at least 105%
   - The AAS that can be used for a contribution holiday at the date of the cost certificate is the lesser or:
     - 1. The AAS at the last full valuation less any contribution holiday taken since and
     - 2. The AAS at the cost certificate date reflecting benefit improvement

3. Notify plan members of the contribution holiday

   - Plan members should be notified within the first six months of the fiscal year in which the planned reduction is to occur. Where the planned reduction is to occur more than six months after the start of a fiscal year, the notice must be given within six months following the end of the fiscal year in which the planned reduction is to occur

6. Continued

(c) Describe the considerations that apply when a plan sponsor intends to use the same surplus to fund both a benefit improvement and a contribution holiday.

Commentary on Question:
This question was generally poorly answered. Candidates didn't identify that the impact of the benefit improvement had to be considered before the contribution holiday.

- The surplus for contribution holiday for the full year must be sufficient after factoring in the benefit improvement taking into effect July 1, 2026
- Benefit improvement may reduce surplus available for a holiday
- If surplus can't fund both a benefit improvement and contribution holiday, plan sponsor must choose one or resume contributions
- Actuarial assumptions must reflect the impact of the benefit improvement (e.g. plan duration or termination/retirement assumption)
- Funding rules in respect of plan amendments must be followed should the funded level reflecting the plan amendment not be sufficient - lump sum contribution to meet 85% solvency ratio and 90% going-concern ratio, and 5-year amortization of remaining deficit