SOCIETY OF ACTUARIES

Actuarial Topics for Canadian Retirement Plans

Exam RET 301

Date: Friday, March 27, 2026

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 6 questions numbered 1 through 6 with a total of 50 points.

   The points for each question are indicated at the beginning of the question.

2. While every attempt is made to avoid defective questions, sometimes they do occur. If you believe a question is defective, the supervisor or proctor cannot give you any guidance beyond the instructions provided in this document.

Written-Answer Instructions

1. Each question part or subpart should be answered either in the Word document or the Excel file as directed. Graders will only look at work in the indicated file.

   a) In the Word document, answers should be entered in the box marked ANSWER. The box will expand as lines of text are added. There is no need to use special characters or subscripts (though they may be used). For example, β_1 can be typed as beta_1 (and ^ used to indicate a superscript).

   b) In the Excel document, formulas should be entered. Performing calculations on scratch paper or with a calculator and then entering the answer in the cell will not earn full credit. Formatting of cells or rounding is not required for credit.

2. The answer should be confined to the question as set.

3. Prior to uploading your Word and Excel files, each file should be saved and renamed with your unique candidate number in the filename. To maintain anonymity, please refrain from using your name and use your candidate number instead.

4. The Word and Excel files that contain your answers must be uploaded before the five-minute upload period expires.

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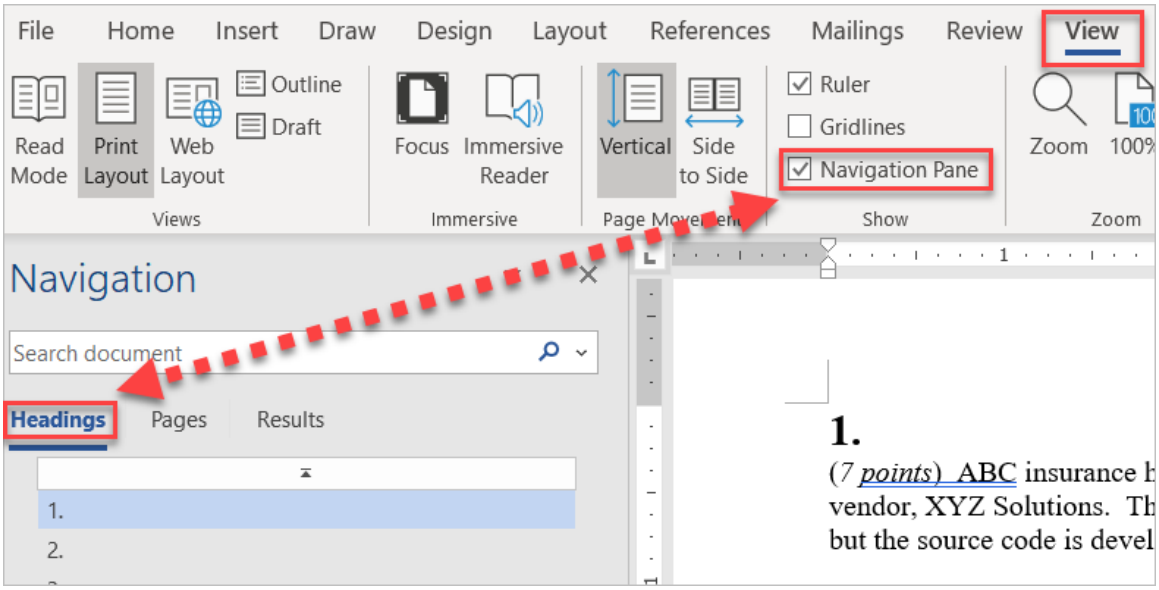
Navigation Instructions

Open the Navigation Pane to jump to questions.

Press Ctrl+F, or click View > Navigation Pane:



GENERAL INSTRUCTIONS

- All questions indicate whether the response is to be answered in Word or Excel. Only the Word document will be graded for parts of a question with Word answer boxes; only the Excel spreadsheet will be graded for parts of a question with Excel instructions.
- When answering in Excel, “show your work” means
    - Calculation formulas must be used in the answer cells containing the work.
    - All work should be labeled.

1.

(*10 points*)

(a) (*3 points*) 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

ANSWER:

(b) (*2 points*) Describe four considerations when assessing the appropriateness of assuming added value from active management in the best estimate discount rate.

ANSWER:

(c) (*1 point*) Describe the two approaches for reflecting plan administration-related expenses in a going concern valuation.

ANSWER:

(d) (*2 points*) 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.

ANSWER:

1. Continued

Company ABC sponsors a defined benefit pension plan. The plan is currently 85% funded on a solvency basis and has an asset mix of 60% equities and 40% bonds. Company ABC is implementing a glide-path under which the asset mix will gradually shift from equities to bonds, attaining an asset mix of 20% equities and 80% bonds when the plan is fully funded on a solvency basis.

(e) (*2 points*) Explain the considerations in setting the going concern discount rate under the glide-path strategy.

ANSWER:

2.

(*8 points*) Your client sponsors a single-employer defined benefit pension plan registered in Ontario. The plan is closed and both service and salaries have been frozen.

Going concern information as at December 31, 2024:

Going concern assets - including buy-in annuity - excluding present value of special payments previously established in respect of any past service unfunded actuarial liability	$70,314,556
Going concern liabilities - including buy-in annuity - excluding provision for adverse deviations	$76,890,000
Buy-in annuity value included in going concern assets and liabilities	$40,000,000
Going concern annual employer current service cost	$0
Annual provision for administrative expenses	$100,000
Going concern discount rate (net of investment expenses; gross of administrative expenses)	5.00%
Provision for adverse deviations	8.00%

Solvency information as at December 31, 2024:

Solvency assets - including buy-in annuity - excluding wind-up expenses	$61,848,159
Solvency liabilities - including buy-in annuity	$87,300,000
Buy-in annuity value included in solvency assets and liabilities	$45,000,000
Solvency blended discount rate	2.5%
Provision for wind-up expenses	$400,000

2. Continued

Other Information:

Special payment schedule as at December 31, 2024:

	Annual payment	Period remaining
Going concern	$500,000	10 years
Solvency	$345,841	3 years

There are no allowable exclusions from the solvency liabilities (e.g. consent benefits).

(a) (*5 points*) Calculate the minimum required and maximum permissible employer contributions in 2025.

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

(b) (*3 points*) Calculate the minimum required employer contributions in 2026 based on the December 31, 2024 valuation results.

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

3.

(*7 points*) Member A and Member B are retiring from active status on December 1, 2025 from a defined benefit pension plan registered in Ontario.

You are given the following information as at December 1, 2025:

Plan Information

Normal Retirement Age	Age 65
Early Retirement Age	Age 55
Normal Retirement Benefit	2% of final 3-year average earnings multiplied by credited service
Bridge Benefit	$1,500 per month, payable from early retirement until age 65, only available to members hired on or before January 1, 2010.
Normal Form of Payment	Life only, payable monthly in advance
Termination Benefit	Deferred pension payable at age 65; early retirement pension is actuarially equivalent
Early Retirement Reductions for Retirement and Bridge Benefit	4% per year between age 60 and 65 plus 6% per year before age 60 A member may retire unreduced, if age + credited service are greater than or equal to 85

Member Information

	Member A	**Member B**
Age in years	59	57
Years of Credited Service	25	7
Date of Hire/Plan Entry	December 1, 2000	December 1, 2018
Marital Status at Retirement	Single	Single
Final 3-year Average Earnings	$255,000	$280,000

3. Continued

Additional Information

- Both members are retiring on December 1, 2025.
- Actuarial equivalence is determined based on going concern assumptions from the latest filed actuarial valuation.
- 2025 Income Tax Act defined benefit dollar limit is $3,756.67 per year of service.
- Maximum Old Age Security pension ("OAS") payable in December 2025 is $727.67 per month.
- Canada Pension Plan ("CPP") maximum pension benefit for 2025 is $1,433 per month.
- The three-year average YMPE is $68,800
- The Plan text applies the maximum benefit tests at the earlier of termination, retirement or death.

Going Concern Annuity Factors

$\ddot{a}_{57}^{(12)} = 17.20$	$\ddot{a}_{59}^{(12)} = 16.61$
${}_{8\|}\ddot{a}_{57}^{(12)} = 10.83$	${}_{6\|}\ddot{a}_{59}^{(12)} = 11.68$

(a) (*6 points*) 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.

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

3. Continued

The pension plan also offers a commuted value option at retirement. Member A elects to transfer the lump sum commuted value to a Locked-In Retirement Account. You are given the following information regarding the lump sum payment:

- The lump sum commuted value is $1,148,000 at December 1, 2025.
- Interest will be credited at 3.6% per year from December 1, 2025 to the date of payment.
- The transfer date is April 1, 2026

The annuity factors at various ages under the Maximum Transfer Value (MTV) of section 8517 of the Income Tax Act are provided below.

Age	MTV Factor
55	10.4
56	10.6
57	10.8
58	11.0
59	11.3
60	11.5
61	11.7
62	12.0

(b) (*1 point*) Calculate the maximum amount Member A is able to transfer to their Locked-In Retirement Account.

Show all work.

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

4.

(*7 points*) You are the actuary for a non-contributory defined benefit pension plan registered in Ontario. You are provided the following plan provisions:

Normal Retirement Benefit:	2% x Final Average Earnings per year of credited service
Normal Form of Pension:	Life only, guaranteed for 5 years
Normal Retirement Age (NRA):	Age 65
Early Retirement Age:	Age 55
Early Retirement Benefit:	Reduction of 3% per year before NRA, unreduced with 20 years of service
Termination Benefit:	Commuted value of a deferred pension, payable before NRA
Maximum Benefit:	As per the Income Tax Act (ITA)
Defined Benefit Limit:	$3,756.67

A member has voluntarily terminated their employment. You are given the following information at their termination date:

Member's Age	55
Years of Service	22
Final Average Earnings	$180,000

(a) (*2 points*) Calculate the monthly pension payable from the pension plan assuming immediate retirement.

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

You are given the following information:

CANSIM Series	**Description**	**Rate**
V122542	7-year Government of Canada benchmark bond yield	2.85% per annum
V122544	Long-term Government of Canada benchmark bond yield	3.18% per annum
V122553	Government of Canada bond yield	1.33% per annum

4. Continued

The annual bond yield spreads have been determined as follows:

$s_{1\text{-}10} = 0.73576\%$

$s_{10+} = 1.16152\%$

(b) (*2 points*) Calculate the interest rates used to determine the commuted value in accordance with the CIA Standards of Practice, Section 3500.

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

The member elected to commute the value of their pension. You are given the following:

Annuity Factors:

Pension Start Age	Single Life with 5-year guarantee
55	9.6
56	9.3
57	8.9
58	8.5
59	8.2
60	7.8
61	7.5
62	7.1
63	6.7
64	6.4
65	6.0

(c) (*3 points*) Calculate the commuted value as at the member's termination date.

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

5.

(*10 points*)

(a) (*2 points*) Compare and contrast the solvency incremental cost (SIC) and the going concern normal cost (NC).

ANSWER:

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

You are given:

- Plan A has frozen credited service as of January 1, 2025 with only active members.
- Plan B has frozen credited service and frozen final average earnings as of January 1, 2025 with only active members.
- Plan C has actives, pensioners, and deferred vested members who were involuntarily terminated from employment in Ontario with age plus service (points) over 55. A portion of Plan C's active members will become eligible for subsidized early retirement at age 60 between January 1, 2025 and January 1, 2028.
- Both Plan A and Plan B have no expected decrements between January 1, 2025 and January 1, 2028.

(b) (*2 points*) Identify which plan(s) would have a SIC greater than zero. Justify your answer.

ANSWER:

(c) (*3 points*) Describe the methodology and assumptions required to calculate the SIC for each of the plans with a SIC greater than zero.

ANSWER:

5. Continued

You are given the following for Plan C:

Valuation date	January 1, 2025
Next calculation date	January 1, 2028
Going concern discount rate	4.75%
Solvency discount rate for lump sum transfers	4.50%
Solvency discount rate for annuity purchase	4.65%

	2025	2026	2027
Expected benefit payments (assume middle-of-year timing)	10,274,000	10,914,000	10,195,000

	2025-01-01	2026-01-01	2027-01-01	2028-01-01
Projected solvency liabilities – portion assumed to be settled by lump sum	31,156,000	30,749,000	28,918,000	27,077,000
Projected solvency liabilities – portion assumed to be settled by annuity purchase	186,575,000	198,468,000	207,361,000	219,127,000

(d) (*3 points*) Calculate the SIC for the three-year inter-valuation period.

Show all work.

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

6.

(*8 points*) You are the actuary for a defined benefit pension plan registered in Ontario. The most recent actuarial valuation report revealed an available actuarial surplus as at January 1, 2026. The plan sponsor is implementing a benefit improvement as at July 1, 2026 for all active members and intends to take a contribution holiday for 2026.

(a) (*3 points*) Describe the legislative requirements for implementing a plan amendment that improves member benefits.

ANSWER:

(b) (*3 points*) Describe the legislative requirements for taking a contribution holiday.

ANSWER:

(c) (*2 points*) 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.

ANSWER:

****END OF EXAMINATION****