SOCIETY OF ACTUARIES
Funding and Regulation Exam – Canada

Exam RETFRC

AFTERNOON SESSION

Date: Wednesday, April 26, 2017
Time: 1:30 p.m. – 3:45 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This afternoon session consists of 5 questions numbered 8 through 12 for a total of 40 points. The points for each question are indicated at the beginning of the question. None of the questions pertain to the Case Study.
2. Failure to stop writing after time is called will result in the disqualification of your answers or further disciplinary action.
3. 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 on the exam booklet.

Written-Answer Instructions

1. Write your candidate number at the top of each sheet. Your name must not appear.
2. Write on only one side of a sheet. Start each question on a fresh sheet. On each sheet, write the number of the question that you are answering. Do not answer more than one question on a single sheet.
3. The answer should be confined to the question as set.
4. When you are asked to calculate, show all your work including any applicable formulas.
5. When you finish, insert all your written-answer sheets into the Essay Answer Envelope. Be sure to hand in all your answer sheets because they cannot be accepted later. Seal the envelope and write your candidate number in the space provided on the outside of the envelope. Check the appropriate box to indicate morning or afternoon session for Exam RETFRC.
6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

Tournez le cahier d’examen pour la version française.

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****BEGINNING OF EXAMINATION****
Afternoon Session
Beginning with Question 8

8. (*6 points*) Your client established a new non-contributory defined benefit pension plan as at January 1, 2017.

You are given:

Plan provisions:

Normal retirement benefit:	1% of final year's earnings per year of service
Normal form of payment:	Life only, payable monthly in advance
Normal retirement age:	Age 65
Early retirement age:	Age 55
Early retirement reduction:	3% per year prior to Normal retirement age
Termination benefit:	Accrued pension deferred to age 65

Actuarial assumptions as at January 1, 2017:

Interest rate:	5.0% per year
Salary increase rate:	4.0% per year
Retirement decrements:	50% at age 55 and the remainder at age 65
Termination decrements:	10% per year prior to age 30, 0% thereafter
Other pre-retirement decrements:	None
Timing of decrements:	Beginning of year

Annuity Factors:

$\ddot{a}_{65}^{(12)} = 13.5 \qquad \ddot{a}_{55}^{(12)} = 16.0$

Participant Data at January 1, 2017:

	Member A	Member B
Age:	29	50
Service:	5 years	10 years
2016 Earnings	$50,000	$100,000

8. **Continued**

Calculate the accrued liability and normal cost as at January 1, 2017 using the following cost methods:

(i) Projected unit credit, pro-rated on service

(ii) Individual Level Premium

Show all work.

9. (*8 points*) You are the actuary for a construction company that sponsors two defined benefit pension plans. One plan covers salaried office workers. The other plan covers hourly construction workers.

You are performing the going concern funding valuations as of January 1, 2017.

You are given:

Membership statistics as of January 1, 2017:

	Salaried Plan	**Hourly Plan**
Active		
Count	30	20,000
Average age	46.1	45.8
Average annual earnings	$94,000	$48,000
Deferred Vested		
Count	10	3,000
Average age	53.3	53.1
Average annual benefit	$15,600	$1,100
Pensioners		
Count	40	25,000
Average age	69.1	68.9
Average annual benefit	$48,000	$5,500

Describe how you would set the going concern pre-retirement and post-retirement mortality assumptions for the January 1, 2017 valuation for:

(i) The Salaried plan; and

(ii) The Hourly plan, assuming an experience study has been completed.

10. (*10 points*) Compare and contrast the elements of a funding policy established in accordance with CAPSA Guideline No. 7 for the following:

(i) a traditional defined benefit pension plan

(ii) a target benefit pension plan

11. (*10 points*) You are the actuary for a closed non-contributory defined benefit pension plan registered in Ontario. You have prepared a valuation as at December 31, 2015.

You are given the following:

Valuation results as at December 31, 2015:

	Going concern	**Solvency/Hypothetical Wind-up**
Market Value of Assets	\$840,000	\$840,000
Wind-up Expense		\$50,000
Liability	\$900,000	\$1,000,000
2016 Going-concern Service Cost	\$80,000	N/A
2016 Solvency incremental Cost	N/A	\$130,000
Discount Rate	4.00% per year	3.00% per year

Additional information:

- There are no special payment schedules established prior to December 31, 2015
- The company does not defer new going-concern and solvency special payments by one year.

Annuity factor:

Discount Rate	4.75%	4.00%	3.75%	3.00%
$\ddot{a}_{\overline{5}\rceil}^{(12)}$	4.50	4.50	4.60	4.70
$\ddot{a}_{\overline{15}\rceil}^{(12)}$	10.80	11.40	11.50	12.10

(a) (*3 points*) Calculate the minimum required and maximum permissible employer contributions for 2016.

11. **Continued**

The December 31, 2015 funding valuation report was filed with the regulators in 2016. You are preparing the December 31, 2016 valuation.

You are given the following:

	2016
Net investment return	10% per year
Contributions (mid-year)	Minimum required
Benefit payments (mid-year)	$100,000

	Going concern	**Solvency/Hypothetical Wind-up**
Discount rate	4.75% per year	3.75% per year
Decrease in liability due to change in discount rate	$100,000	$120,000
Decrease in service cost	$10,000	N/A
Decrease in solvency incremental cost	N/A	$12,000

(b) (*5 points*) Calculate the minimum required and maximum permissible employer contributions for 2017 to be presented on the December 31, 2016 valuation report.

(c) (*2 points*) You were not able to file the valuation report until September 30, 2017. Calculate the minimum required employer contribution for 2017.

Show all work.

12. (*6 points*) Compare and contrast the following arrangements from a regulatory perspective:

- a Deferred Profit Sharing Plan
- a Group Registered Retirement Savings Plan, and
- a registered defined benefit pension plan,

with respect to the following:

(i) Maximum employer and employee contributions;

(ii) Ability to provide past service benefits;

(iii) Tax-sheltered lump sum transfer limits; and

(iv) Locking-in requirements and allowable exceptions.

****END OF EXAMINATION****
Afternoon Session

USE THIS PAGE FOR YOUR SCRATCH WORK

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