SOCIETY OF ACTUARIES
Funding and Regulation Exam – Canada

Exam RETFRC

AFTERNOON SESSION

Date: Wednesday, October 28, 2015
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. Questions 9 and 12 pertain to the Case Study, which is enclosed inside the front cover of this exam booklet.
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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CASE STUDY INSTRUCTIONS

The case study will be used as a basis for some examination questions. Be sure to answer the question asked by referring to the case study. For example, when asked for advantages of a particular plan design to a company referenced in the case study, your response should be limited to that company. Other advantages should not be listed, as they are extraneous to the question and will result in no additional credit. Further, if they conflict with the applicable advantages, no credit will be given.

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

8. (*6 points*) You have been asked to peer review a funding valuation report prepared by a colleague. In reviewing the report, you realize the following:

- You are not comfortable with the funding assumptions used;
- You are not familiar with the type of plan valued; and
- The prior valuation report contains a material error.

Explain how you will address each of the above concerns, taking into account the rules of professional conduct.

Question 9 pertains to the Case Study.

9. (*12 points*) You are the actuary for the NOC Full-Time Hourly Union Pension Plan. NOC is considering the following improvements to the early retirement benefits for active participants effective January 1, 2015:

Plan provision:	**Proposed change**
Unreduced retirement age for active participants:	Age 60 with 30 years of service
Early retirement reduction for active participants:	0.25% per month that early retirement precedes the earlier of Normal Retirement Age or Unreduced Retirement Age
Bridge benefit:	$30 per month per year of service (past and future) for retirements after 2014
Bridge benefit eligibility:	Payable starting from age 55

You are given:

<u>Sample Participant Data as at January 1, 2015</u>:

	<u>Member A</u>	**<u>Member B</u>**
Age:	57	42
Years of service:	24 years	1 year

<u>Annuity Factors</u>:

Pension Start Age	**Single Life Annuity Factor**	**Joint & 60% Survivor Annuity Factor**	**Temporary to Age 65 Annuity Factor**
60	14.4	16.0	4.3
62	13.8	15.5	2.7

(a) (*6 points*) Calculate the impact of the proposed change in early retirement benefits on the going concern liabilities as at January 1, 2015 for each sample participant, assuming no change to the retirement age assumption.

Show all work.

9. Continued

NOC has approved the proposed change in early retirement benefits. As a result, it has been proposed that the going concern retirement age assumption be changed to age 60 for the valuation as at January 1, 2015.

(b) (*2 points*) Critique the proposed change to the going concern retirement age assumption.

(c) (*4 points*) Calculate the impact of the change in retirement age assumption on the going concern liabilities as at January 1, 2015 for each sample participant.

Show all work.

10. (*8 points*) Your client sponsors a non-contributory defined benefit pension plan.

You are given:

Plan Provisions as at January 1, 2015:

Normal retirement benefit:	$85 per month per year of service
Normal form of payment:	Life only, payable monthly in advance
Normal retirement age:	Age 65
Early retirement reduction:	3% per year prior to age 65

Actuarial Assumptions and Methods as at January 1, 2015:

Interest rate:	5.5% per annum
Retirement age:	Age 60
Actuarial cost method:	Entry Age Normal
Pre-retirement decrements:	None

Annuity Factor:

$\ddot{a}_{60}^{(12)} = 13.9$

Participant Data as at January 1, 2015:

	Group A	Group B
Age:	50	58
Years of service:	20 years	25 years
Number of members:	100	25

(a) (*5 points*) Calculate the accrued liability and normal cost for the plan as at January 1, 2015.

(b) (*3 points*) The normal retirement benefit will increase to $90 per month per year of service for members who retire on or after January 1, 2019. The benefit rate at retirement applies to all years of service.

Calculate the increase in the accrued liability and normal cost as at January 1, 2015.

Show all work.

11. (*6 points*) You are given the pension fund asset reconciliation for the ABC Pension Plan:

	Year 1	Year 2	Year 3	Year 4	Year 5
Market Value of Assets at Beginning of Year	$1,844,360	$2,415,790	$2,576,930	$2,134,560	$2,359,930
Net Cash Flow	589,600	620,550	(451,850)	(421,860)	(434,560)
Unrealized Gain/(Loss)	122,550	(489,630)	(66,270)	325,780	214,950
Realized Gain/(Loss)	(140,720)	30,220	75,750	321,450	186,320
Market Value of Assets at End of Year	$2,415,790	$2,576,930	$2,134,560	$2,359,930	$2,326,640

As the actuary, you are comparing three possible asset valuation methods as follows:

(i) The Market Value of Assets (MVA);

(ii) An Adjusted Value of Assets (AVA) set equal to the MVA with a linear recognition of all gains and losses over a 6 year period; and

(iii) An AVA where a Preliminary Adjusted Value of Assets (PAVA) is first calculated with gain and loss recognition using annuities-certain over a 3-year period and an interest rate of 4% per annum. Using a reserve account, the AVA under this method is calculated as follows:

- If the PAVA exceeds 105% of the MVA, a cumulative reserve account holds the excess amount; or
- If the PAVA is less than 80% of MVA, amounts in the reserve account are applied to increase the AVA up to the 80% of the MVA.

The reserve account at the end of year 4 holds $540,500.

(a) (*3 points*) Calculate the AVA at the end of year 5 under the above methodologies and the balance of the reserve account in method (iii).

Show all work.

(b) (*3 points*) Assess the appropriateness of the three possible asset valuation methods with respect to the desirable characteristics as described in the CIA Educational Note on Guidance on Asset Valuation Methods.

Question 12 pertains to the Case Study.

12. (*8 points*)

(a) (*3 points*) Describe the principles underlying Pension Adjustments (PAs).

For a member of the NOC Full-Time Salaried Pension Plan, you are given:

	2015
Base pay:	$120,000
Credited service accrued in year:	1 year
Income Tax Act defined benefit limit:	$2,819
Overtime and bonuses paid in year:	$12,000
Money purchase limit:	$25,370

(b) (*2 points*) Calculate the member's 2015 PA.

Show all work.

(c) (*3 points*) The NOC Salaried Plan is amended effective January 1, 2015, for future service only, as follows:

Earnings:	Base pay, including overtime and bonuses
Normal retirement benefit:	Accumulated value of member and employer contributions. Benefits under the plan are subject to a minimum defined benefit guarantee equal to 2% of best average earnings times years of service, subject to the legislative maximum.
Member contribution rate:	8% of Earnings, subject to the legislative maximum
Employer contribution rate:	Equal to member contributions

Calculate the member's 2015 PA reflecting the plan amendment.

Show all work.

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

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