SOCIETY OF ACTUARIES

Funding and Regulation Exam – Canada

Exam RETFRC

AFTERNOON SESSION

Date: Wednesday, Oct 30, 2013
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. Question 10 pertains 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 since 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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475 N. Martingale Road
Schaumburg, IL 60173-2226

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. (*9 points*)

(a) (*1 point*) Identify the criteria that would cause a plan to be a designated plan under the Income Tax Act (Canada).

(b) (*5 points*) The following are some of the prescribed assumptions for a Maximum Funding Valuation. Describe how you would evaluate the appropriateness of these assumptions for the purpose of a going concern funding valuation.

Discount rate:	7.5% per annum
Salary scale:	5.5% per annum
Inflation:	4.0% per annum
Mortality:	80% of GAM83 rates
Retirement age:	Age 65

(c) (*3 points*) You are the actuary of a sole-participant Ontario non-contributory designated defined benefit pension plan.

You are given:

Actuarial valuation results as at January 1, 2013:

Market value of assets: $1,050,000

	Going-concern	**Solvency**	**Maximum Funding**
Asset valuation method	Market value	Market value	Market value
Discount rate	5.50% per annum	3.00% per annum	7.50% per annum
Liability	$1,100,000	$1,500,000	$900,000
Normal cost (beginning of year)	$73,000	$100,000	$60,000

Plan expense: All expenses paid directly by sponsor outside of the pension fund

There are no existing special payments from the last valuation as at January 1, 2012.

Calculate the minimum and maximum employer contributions for 2013 assuming immediate commencement of special payments.

Show all work.

9. (*8 points*) Describe the regulatory considerations for converting a defined benefit pension plan to a defined contribution pension plan.

Question 10 pertains to the Case Study.

10. (*11 points*) You are the actuary for NOC. After presenting the January 1, 2013 funding valuation results for the Full-time Salaried Pension Plan, it has come to your attention that there were errors in the data. NOC has provided the following updated data as at January 1, 2013:

Revised Reconciliation of Plan Participants (2012-2013):

	Active	Pensioners / Beneficiaries	Total
Participants as of January 1, 2012	4,046	821	4,867
New entrants/re-hires	120		120
Terminated non-vested	(60)		(60)
Terminated vested (lump sum cashout)	(150)		(150)
Retirement	(30)	30	-
Death with beneficiary	(4)	4	-
Death without beneficiary	-	(2)	(2)
Net change	(124)	32	(92)
Participants as of January 1, 2013	3,922	853	4,775

Participant Summary – January 1, 2013:

Active Participants

Count	3,922
Average age	47.0
Average service	15.5
Average salary	68,200

Pensioners/Beneficiaries

Count	853
Average age	68.6
Average annual benefit	22,500

(a) (*5 points*) Describe an appropriate course of action with respect to the January 1, 2013 funding valuation taking into consideration professional standards.

(b) (*6 points*) Evaluate the potential impact of the revised data on the January 1, 2013 funding valuation results (no calculations required).

11. (*8 points*) You are the actuary for an Ontario registered pension plan. You are given the following information:

Plan Provisions

Normal retirement age:	Age 65
Normal retirement benefit:	1.5% of final salary times service
Normal form of payment:	Life Only, payable at beginning of year
Optional form of payment:	If married, joint and 60% survivor annuity. The pension payable to the member will be reduced to 90% of the normal retirement benefit.
Bridge benefit:	$200 annual benefit per year of service payable to the earlier of death or age 65 not subject to early retirement reductions.
Early retirement reduction:	3% per year prior to normal retirement age upon retirement from active status, otherwise actuarial equivalent to normal retirement benefit.
Termination benefit:	Accrued lifetime benefit

Assumptions at January 1, 2013

Interest rate:	4% per annum
Salary scale:	3% per annum at end of year
Actuarial cost method:	Projected Unit Credit, prorated on service
Marital assumption:	85%
Retirement age:	Age 60

Participant Data as at January 1, 2013

	Member A	Member B
Age	25	45
Spouse Age	22	42
Service	1.0 year	10.0 years
Salary Rate	$50,000	$75,000

11. **Continued**

Annuity Factors:

	Member age/spouse age	
	Age 25/Age 22	Age 45/Age 42
Deferred to 55 life annuity factor	5.2	11.2
Deferred to 55 joint and 60% survivor annuity factor	5.7	12.3
Deferred to 55 bridge factor	2.5	5.5
Deferred to 60 life annuity factor	3.9	8.5
Deferred to 60 joint and 60% survivor annuity factor	4.3	9.5
Deferred to 60 bridge factor	2.0	2.5
Deferred to 65 life annuity factor	2.8	5.9
Deferred to 65 joint and 60% survivor annuity factor	3.1	6.7

Financial Data:

Market value of assets as at January 1, 2013: $400,000

(a) (*3 points*) Calculate the accrued liability as at January 1, 2013.

(b) (*5 points*) The plan was wound up on January 1, 2013. Determine the wind-up liability for each member as at the wind-up date assuming the wind-up discount rate is 4% per annum for all members.

Show all work.

12. (*4 points*) A member of a defined benefit pension plan has attained normal retirement age and has elected to retire as at January 1, 2013.

You are given:

Accrued monthly benefit as at January 1, 2013:	\$2,000 per month
Normal form of payment:	Life only, payable monthly
Optional forms of payment:	Actuarial equivalent to the normal form of payment assuming 50% male and 50% female unisex mortality (i) One time lump sum payment of \$312,000 (ii) (\$2,000 – \$K) per month joint and survivor 100% pension, with a \$K per month increase if the spouse dies first; or (iii) \$1,800 per month joint and survivor 50% pension

The member and the member's spouse are the same age.

Calculate K.

Show all work.

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

USE THIS PAGE FOR YOUR SCRATCH WORK

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