

# Exam RETFRC

## Funding and Regulation Exam – Canada

### AFTERNOON SESSION

**Date:** Wednesday, May 1, 2019

**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 8 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.

*Canadian version of this exam is recognized by the Canadian Institute of Actuaries.*

Tournez le cahier d'examen pour la version française.



## **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*

*Question 8 pertains to the Case Study*

- 8.** (7 points) The CFO of DPC retired on January 1, 2018. You have been asked to determine his retirement benefit from the Pension Plan for Employees of DPC Limited.

You are given:

**Data as at January 1, 2018:**

Age in years:	57
Years of service:	30
Marital status:	Married
Best average earnings during 60 consecutive months:	\$560,000
Highest average three-year indexed compensation:	\$575,000

**Additional information:**

January 2018 maximum monthly OAS benefit:	\$586.66
January 2018 maximum monthly C/QPP benefit:	\$1,134.17
2018 Income Tax Act Defined Benefit Dollar Limit:	\$2,944.44
Three-year average YMPE at January 1, 2018:	\$54,600.00
Form of pension elected:	Joint and 100% survivor

Annuity factors	Joint and 60% survivor	Joint and 66.67% survivor with a five-year guarantee	Joint and 100% survivor
Immediate and commencing at age 57	16.3	16.5	17.3

Calculate the lifetime and bridge pensions payable at January 1, 2018 for the CFO's elected form of pension.

Show all work.

**9.** (8 points) The Government of Country XYZ is establishing a new employer-sponsored pension system with the following objectives:

- Encouragement of retirement savings;
- Protection of accrued benefits; and
- Reasonable but limited tax-sheltering.

Recommend five features from the Pension Benefits Act (Ontario) or the Income Tax Act that the Government of Country XYZ could adopt in order to meet these objectives.

Justify your recommendation.

**10.** (12 Points) Your client sponsors a non-contributory defined benefit pension plan. You are performing a valuation as at January 1, 2019.

You are given:

**Plan Provisions:**

Normal Retirement Benefit: 1.0% of final year's earnings times years of Credited Service

Normal Retirement Age: Age 65

Early Retirement Age: Age 55

Earliest Unreduced Retirement Age: Age 62 with 10 years of Credited Service

Early Retirement Reduction: 3% for each year prior to Earliest Unreduced Retirement Age

Normal Form of Benefit: Life only, payable monthly in advance

Termination Benefit: Deferred pension payable at Normal Retirement Age

**Actuarial Assumptions:**

Discount Rate: 5.0% per annum

Salary Increase Rate: 2.5% per annum

Retirement Assumption:

Age	Rate
Under 60	0%
60	50%
61	0%
62	75%
63	0%
64	0%
65	100%

## 10. Continued

Termination Assumption:

Age	Rate
50 to 54	2.0%
55 and over	0.0%

All other pre-retirement decrements: None

Timing of decrements: Beginning of year

Actuarial Cost Method: Projected unit credit method

### Annuity Factors:

$\ddot{a}_{60}^{(12)}$	15.0
$\ddot{a}_{62}^{(12)}$	14.5
$\ddot{a}_{63}^{(12)}$	14.2
$\ddot{a}_{65}^{(12)}$	13.5

### Active Member Data as at January 1, 2019

Member	A	B
Age in Years	53	62
Years of Credited Service	6	15
2018 Pensionable Earnings	\$50,000	\$85,000

(a) (6 points) Calculate the actuarial liability and normal cost as at January 1, 2019.

You are given the following additional information:

- Member A terminates on December 31, 2019 after accruing one additional year of credited service.
- Member A's actual pensionable earnings during 2019 are \$51,250.
- Member B retires on December 31, 2019 after accruing one additional year of credited service.
- Member B's actual pensionable earnings during 2019 are \$92,000.

(b) (2 points) Calculate the actuarial liability as at January 1, 2020.

(c) (4 points) Calculate the gains and losses by source for 2019.

Show all work.

- 11.** (8 points) You are leading a committee tasked with reviewing and approving a new third-party valuation software system.
- (a) (2 points) Explain why the valuation software system is considered a model according to actuarial standards of practice.
  - (b) (6 points) Describe the objectives, considerations and steps that should be taken to review and approve the valuation software system in accordance with actuarial standards of practice.



*Question 12 pertains to the Case Study*

**12.** (5 points) You are the new actuary for the DPC Plan and are preparing a funding valuation as at January 1, 2019.

(a) (3 points) Identify the data required to perform the valuation.

The DPC Plan has been amended to include bonuses in pensionable earnings; however, such data will not be available in time for the completion of the valuation.

(b) (2 points) Describe how you would reflect the inclusion of bonuses in pensionable earnings for the valuation.

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

**USE THIS PAGE FOR YOUR SCRATCH WORK**