
SOCIETY OF ACTUARIES
Design & Accounting Exam – Canada

Exam RETDAC

MORNING SESSION

Date: Thursday, November 2, 2017

Time: 8:30 a.m. – 11:45 a.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 100 points. It consists of a morning session (worth 60 points) and an afternoon session (worth 40 points).
 - a) The morning session consists of 8 questions numbered 1 through 8.
 - b) The afternoon session consists of 5 questions numbered 9 through 13.

The points for each question are indicated at the beginning of the question. Questions 3 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 RETDAC.
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.

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****
Morning Session

- 1.** (5 points)
- (a) (2 points) Describe the features of an annuity buy-in.
 - (b) (3 points) Compare and contrast annuity buy-ins and annuity buy-outs.

2. (5 points)

- (a) (3 points) Describe the reasons why a company may implement an International Pension Plan.
- (b) (2 points) Describe the considerations when evaluating whether to fund an International Pension Plan.

Question 3 pertains to the Case Study.

3. (12 points) NOC is looking to amend the National Oil Full-Time Salaried Pension Plan (Salaried Pension Plan) by adding a defined contribution (DC) provision to the plan. NOC is initially considering converting the Salaried Pension Plan accrued benefit into a DC account balance and having all future benefits accrue under the DC plan.

(a) (4 points) Describe the advantages and disadvantages of this plan conversion from the following perspectives:

- (i) employer
- (ii) employee

NOC is also considering two additional options:

- Freeze service accruals in the existing Salaried Pension Plan and all future benefits accrue under the DC plan.
- Keep existing employees in the defined benefit provision of the Salaried Pension Plan and provide the DC plan to new hires only.

(b) (3 points) Describe in words the accounting impact for all three options NOC is considering.

No calculations required.

NOC has decided to implement a DC plan for salaried new hires effective January 1, 2018. NOC would like the employer contribution rate of the new DC plan to provide the same value at retirement as the current DB plan for the typical career employee.

You are provided the following assumptions and information for a typical career employee:

| | |
|---------------------------------------|----------|
| Age at retirement | 60 |
| Service at retirement | 30 |
| Salary at date of hire | \$45,000 |
| Salary scale | 3.0% |
| Assumed return on DC plan investments | 6.5% |
| Age 60 annuitization factor | 11.5 |

(c) (5 points) Calculate the DC contribution rate that would provide the same value for a typical career employee at retirement as the current Salaried Pension Plan.

Show all work.

4. (8 points)

- (a) (4 points) Describe the challenges in achieving full integration of an employer provided retirement plan with a defined benefit social security program.

Company XYZ sponsors a defined benefit plan in a country where the social security program offers a flat \$300 monthly benefit to employees whose final salary is less than the Social Security Covered Limit. Employees whose final salary is more than the Social Security Covered Limit do not receive any government benefit.

You are given the following:

| | |
|---|---|
| Company XYZ Plan Formula | 1.4% of final salary up to the social security covered limit plus 2.0% of final salary above the social security covered limit for each year of service |
| Social Security Covered Limit | \$54,000 |
| Company XYZ Lifetime Plan Service Maximum | 35 years |

- (b) (4 points) Explain why Company XYZ's plan design is not equitable for all lifetime employees.

Justify your response, including examples using replacement ratios.

Show all work.

5. (8 points) Company ABC is acquiring a division of Company XYZ through an asset-purchase transaction. Company XYZ sponsors a defined benefit pension plan for the division being acquired. Company ABC currently does not sponsor any pension plan.

(a) (3 points) Describe the advantages and disadvantages of the following pension arrangements for the acquired division’s employees from both companies’ perspectives:

- (i) Company XYZ retains all past-service pension liability and Company ABC establishes an identical pension plan for all future service.
- (ii) Company ABC assumes XYZ’s pension plan, including all past service pension liabilities.

The transaction occurs on September 30, 2017. You are given:

- Company ABC will assume sponsorship of Company XYZ’s defined benefit pension plan, including all past and future service liability associated with the division’s employees.
- No other changes are made to the pension plan.
- Company ABC’s existing employees will not participate in the pension plan.
- Financial statement information for the pension plan is shown below:

| Funded Status and Accumulated Other Comprehensive Income | December 31, 2016 |
|---|--------------------------|
| Defined Benefit Obligation | \$150,000,000 |
| Fair Value of Assets | \$120,000,000 |
| Funded Status | (\$30,000,000) |

| Defined Benefit Cost (Prior to the Transaction) | Fiscal 2017 |
|--|--------------------|
| Service Cost | \$8,500,000 |
| Net Interest Cost | \$900,000 |
| Defined Benefit Cost | \$9,400,000 |

| | |
|---------------------------------------|--------------|
| Discount Rate | 4% |
| Fiscal Year Expected Contributions | \$15,000,000 |
| Fiscal Year Expected Benefit Payments | \$10,000,000 |

5. Continued

- Actual contributions and benefit payments through September 30, 2017 were as expected and made uniformly during the period.
- Actual return on plan assets through September 30, 2017 was 10%.
- There were no gains, losses or assumption changes during the period before the transaction date.

- (b) (3 points) Calculate the revised fiscal year 2017 Defined Benefit Cost by component under international accounting standard IAS 19, Rev 2011 for Company XYZ as a result of the transaction.

Show all work.

- (c) (2 points) Calculate the fiscal 2017 Defined Benefit Cost under international accounting standard IAS 19, Rev 2011 for Company ABC, assuming no changes to the assumptions.

Show all work.

6. (7 points) You are given the following plan design for a company:

| | |
|-------------------------------|---|
| Benefit on pay below \$50,000 | Career average pay defined benefit (DB) |
| Benefit on pay above \$50,000 | Defined contribution (DC) benefit with participant-directed investments |
| Distribution at retirement | DB benefit paid as life annuity; DC benefit paid as lump sum |

Assume this plan design is legislatively permissible.

- (a) (3 points) Describe how the characteristics of the plan design affect the following risks for the plan sponsor and participants:
- (i) Inflation risk
 - (ii) Longevity risk
 - (iii) Investment risk

The company wishes to reduce the plan participant exposure to the above risks in a manner that is approximately cost-neutral to the company.

- (b) (4 points) Recommend plan design changes that accomplish this goal.

Justify your response.

7. (7 points)

- (a) (3 points) Describe six plan design features for a defined contribution plan that help participants generate adequate retirement savings during their working career.

Your client is implementing a defined contribution plan with fixed employer contributions of 6% of salary. The plan has one participant and you are given the following:

| | |
|---|----------|
| Age at plan inception | 30 |
| Retirement age | 65 |
| Annual salary at plan inception | \$60,000 |
| Assumed annual rate of return on savings | 5.5% |
| Annual salary increase rate | 2.0% |
| Lump sum conversion factor at age 65 | 12.85 |
| Initial lump sum transferred in by employee at plan inception | \$10,000 |

- (b) (3 points) Calculate the retirement replacement ratio if the participant contributes 4% of salary.

Show all work.

- (c) (1 point) Calculate the employee contribution rate that will result in a retirement replacement ratio of 70%.

Show all work.

8. (8 points)

(a) (3 points) Identify the objectives of all public sector pension plan stakeholders.

The local government has proposed to freeze the non-contributory public defined benefit pension plan and replace it with a defined contribution plan with the following features:

- Required employee contributions
- Required employer contributions
- Employee directed investments

(b) (5 points) Describe the effect this proposal will have on all public sector pension plan stakeholders identified in part (a).

****END OF EXAMINATION****
Morning Session

USE THIS PAGE FOR YOUR SCRATCH WORK

USE THIS PAGE FOR YOUR SCRATCH WORK