

Exam RETDAU

Date: Wednesday, October 28, 2020

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 13 questions numbered 1 through 13 with a total of 100 points.

The points for each question are indicated at the beginning of the question. Questions 7, 9 and 12 pertain to the Case Study.

2. 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 provided in this document.

Written-Answer Instructions

1. Each question part or subpart should be answered either in the Word document or the Excel file as directed. Graders will only look at work in the indicated file.
 - a) In the Word document, answers should be entered in the box marked ANSWER. The box will expand as lines of text are added. There is no need to use special characters or subscripts (though they may be used). For example, β_1 can be typed as beta_1 (and ^ used to indicate a superscript).
 - b) In the Excel document formulas should be entered. Performing calculations on scratch paper or with a calculator and then entering the answer in the cell will not earn full credit. Formatting of cells or rounding is not required for credit.
 - c) Individual exams may provide additional directions that apply throughout the exam or to individual items.
2. The answer should be confined to the question as set.
3. The Word and Excel files that contain your answers must be uploaded before time expires.

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

GENERAL INSTRUCTIONS

- All questions indicate whether the response is to be answered in Word or Excel. Only the Word document will be graded for parts of a question with Word answer boxes; only the Excel spreadsheet will be graded for parts of a question with Excel instructions.
- When answering in Excel, “show your work” means
 - Word formulas must be written out prior to substituting in the numbers.
 - Calculation formulas must be used in the answer cells containing the work.
 - All work should be labeled.
- When answering in Excel, formatting and rounding is not required for credit.

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.

1. (7 points) Company ABC is a small company with a young and mobile workforce. Company ABC sponsors a final average pay defined benefit (DB) plan.

(a) (1 point) Describe four disadvantages of a DB plan from the perspective of Company ABC's employees.

ANSWER:

(b) (2 points) Describe how moving to a defined contribution (DC) plan can address the disadvantages described in part (a).

ANSWER:

(c) (2 points) Describe behavioral factors that may lead Company ABC's employees to make suboptimal choices if the company adopts a DC plan.

ANSWER:

(d) (2 points) Identify DC plan design features that Company ABC should consider to improve their employees' retirement income adequacy.

Justify your response.

ANSWER:

2. (9 points) An employer representing 30% of the active workforce in an underfunded defined benefit Multi-Employer Pension Plan (MEPP) is withdrawing from the MEPP due to bankruptcy.

(a) (2 points) Describe the following risks from the perspectives of the remaining participating employers and plan members.

- (i) Funding risk
- (ii) Risk of decline in work hours
- (iii) Risk of intergenerational transfers

ANSWER:

To address the unfunded liability, the Board of Trustees is considering a plan amendment to decrease both accrued benefits and pensions in payment.

(b) (4 points) Describe the advantages and disadvantages of the proposed amendment from the following perspectives:

- (i) Remaining participating employers
- (ii) Plan members

ANSWER:

(c) (3 points) Describe three alternatives to address the ongoing funding of the MEPP after the withdrawal of a large employer and barriers to their implementation.

ANSWER:

3. (9 points) A municipal government sponsors an ongoing single-employer pension plan and regularly funds an Actuarially Determined Contribution (ADC) to a dedicated plan trust. The trust fund's expected annual investment return is 6.75%. The 20-year municipal bond rate is 4.00%.

The January 1, 2020 liabilities and normal cost are as follows:

	4.00% discount rate	6.75% discount rate
Total Pension Liability	\$143,000,000	\$100,000,000
Normal Cost	\$7,900,000	\$5,000,000
Fair Market Value of Assets	\$95,000,000	
Smoothed Asset Value	\$98,000,000	

- (a) (1 point) Calculate the Net Pension Liability for this plan under GASB Statement 68, Accounting and Financial Reporting for Pensions by State and Local Governmental Employers.

The response for this part is to be provided in the Excel spreadsheet.

The government has decided to stop funding the ADC, intending to fund on a pay as you go basis starting in 2020. The plan actuary calculated a blended discount rate of 5.50% based on this funding strategy change.

- (b) (2 points) Describe how the plan actuary determined the blended discount rate.

No calculations needed.

ANSWER:

You are provided the following information:

Total Pension Liability at 5.50%	\$118,000,000
Total expected remaining service	4,500 years
Number of active employees	500
Number of inactive participants	1,000

- (c) (2 points) Calculate the change in the Amortization of Assumption Changes in the 2020 pension expense under GASB Statement 68 due to the updated funding strategy.

Show all work.

The response for this part is to be provided in the Excel spreadsheet.

3. Continued

- (d) (4 points) Explain how the municipality's decision to stop funding the ADC impacts the following stakeholders:
- (i) Taxpayers
 - (ii) Plan members
 - (iii) Municipal employers

ANSWER:

4. (9 points) An employer sponsors a post-retirement health plan.

(a) (3 points) Describe considerations when setting the following assumptions:

(i) health care cost trend

(ii) termination rates

ANSWER:

You are given the following information regarding the post-retirement health plan:

- Earliest benefit eligibility is age 55 with 5 years of service
- Current retiree contributions are approximately 20% of total health care costs

The actuary has proposed the following assumptions for the valuation:

Discount rate	4.00%
Health care trend	7.00%
Retirement	Age 65
Mortality	RP-2014 with no mortality improvement
Retiree participation	100%
Other demographic assumptions	None

(b) (6 points) Critique the actuary's proposed assumptions.

ANSWER:

5. (7 points) Company ABC is considering de-risking its Pension Plan through an annuity purchase.

(a) (4 point) Explain why the annuity purchase price would likely be different than the liability currently reflected on the balance sheet.

ANSWER:

You are provided the following additional information about ABC Pension Plan:

Benefit Obligation at an interest rate of 3.8%	\$1,900,000
Duration of Benefit Obligation	14.6
Plan Assets	\$1,700,000
Plan Asset Allocation Mix	50% Fixed Income 50% Equity
Duration of Plan's Fixed Income Assets	5.1

(b) (3 points) Calculate ABC Pension Plan's accounting funded status assuming a 0.65% decrease in interest rates and a 10% increase in the market value of equities.

Show all work.

<i>The response for this part is to be provided in the Excel spreadsheet.</i>

6. (11 points) Company ABC sponsors a pension plan and a retiree health benefit program for its union hourly employees. Hourly employees have the following characteristics:

- Specialized knowledge or skills are not required
- Varying years of service
- Wages are tied to years of service.

Company ABC needs to reduce costs through workforce reduction and is considering the following:

Option 1: Offering an early retirement incentive program (ERIP)

Option 2: Implementing involuntary layoffs

(a) (4 points) Compare and contrast the two options.

ANSWER:

Company ABC has decided to proceed with an ERIP. You have been given the following information about the current benefit programs:

Pension Plan Provisions	
Eligibility	Immediate
Vesting	100% after 5 years of service
Normal Retirement Age	65
Early Retirement Age	55 with 10 years of service
Normal Retirement Benefit	\$80 per month times years of service
Early Retirement Benefit	Unreduced benefit at 62 with 30 years of service, otherwise reduced by 0.25% per month that early retirement precedes Normal Retirement Age

Retiree Health Benefit Program Plan Provisions	
Eligibility	Immediate
Earliest Retirement Age	55 and 20 years of service
Retirement Benefit	Retirees and their spouses may elect to participate in a self-insured health plan, with 100% of the plan cost paid by the employer
Pre-retirement/termination benefits	None

6. Continued

- (b) (2 points) Describe considerations when determining the eligibility criteria for the ERIP.

ANSWER:

- (c) (3 points) Propose four ways to maximize the success of the ERIP.

Justify your response.

ANSWER:

- (d) (2 points) List the information that should be included in the ERIP announcement to employees.

ANSWER:

Question 7 pertains to the Case Study.

7. (8 points) NOC is implementing a phased retirement program.

- (a) (2 points) Describe the advantages of offering a phased retirement program from NOC's perspective.

ANSWER:

- (b) (6 points) Recommend three plan design changes that NOC should make to its retirement benefit plans to ensure equitable treatment between those who participate in the phased retirement program and those who remain full time employees.

Justify your response.

ANSWER:

8. (3 points)

- (a) (1 point) Describe how a variable annuity pension plan delivers benefits.

ANSWER:

- (b) (2 points) Explain how risks could be transferred between the employer and the employee under a variable annuity pension plan.

ANSWER:

Question 9 pertains to the Case Study.

- 9.** (10 points) NOC has decided to freeze pay and service accruals in the National Oil Full-Time Pension Plan effective June 30, 2020. No assumption changes were made since December 31, 2019.

The following information has been provided:

Accumulated Benefit Obligation Service Cost as of 1/1/20	60,000,000
Actual Benefit Payments from 1/1/20 – 6/30/20	18,000,000
Actual Contributions from 1/1/20 – 6/30/20	17,500,000
Market Value of Assets at 6/30/20	645,000,000
Expected Benefit Payments from 7/1/20 – 12/31/20	18,000,000
Expected Contributions from 7/1/20 – 12/31/20	17,500,000
Assumed Benefit Payment and Contribution date	10/1/20
Average Future Working Lifetime as of 7/1/20	10.5

- (a) (7 points) Calculate the impact of the plan freeze on the 2020 Net Periodic Pension Cost under U.S. Accounting Standard ASC 715.

Show all work.

The response for this part is to be provided in the Excel spreadsheet.

- (b) (3 points) Explain how the following de-risking strategies would affect the 2021 financial results under U.S. Accounting Standard ASC 715:
- (i) Option to all retirees to receive an October 1, 2021 lump sum payment in lieu of future lifetime annuities
 - (ii) Full plan termination where all benefits are paid out in 2021

No calculations required.

ANSWER:

10. (6 points)

- (a) (1 point) List Supplemental Executive Retirement Plan (SERP) plan design features that can facilitate the recruitment of mid-career executives.

ANSWER:

- (b) (3 points) Compare and contrast the tax treatment of the following in an unfunded defined benefit SERP versus a qualified defined benefit pension plan:

- (i) Contributions
- (ii) Investment returns
- (iii) Disbursements

ANSWER:

Company XYZ has a deferred compensation agreement with an executive who previously made a qualifying deferral election to receive a distribution one year from now. The agreement is subject to IRS Code Section 409A.

The executive is anticipating a large bonus next year that will increase his income tax rate from 18% to 37% next year, and as a result is considering accelerating his deferred compensation distribution. Assume that an early distribution would not change the executive's income tax rate this year.

- (c) (2 points) Calculate the return the executive must earn on his deferred compensation over the next year such that he would be indifferent between taking an early distribution now and taking the distribution at the time he originally elected.

Show all work.

The response for this part is to be provided in the Excel spreadsheet.

11. (8 points)

- (a) (1 point) Describe the policy ladder for a Canadian Target Benefit Plan (TBP).

ANSWER:

- (b) (3 points) Describe three options available to a TBP to address the absence of a funding guarantee from a plan sponsor.

ANSWER:

- (c) (4 points) Describe four non-investment mechanisms that can be used to reduce benefit risk in a TBP.

ANSWER:

Question 12 pertains to the Case Study.

12. (7 points) NOC is considering ways to improve the future funded status of the National Oil Full-Time Pension Plan.

(a) (2 points) Analyze the impact on current and future funded status of the following:

- (i) Closing the plan to new entrants
- (ii) Freezing plan accruals

No calculations required.

ANSWER:

(b) (3 points) Propose a change to each of the following National Oil Full-Time Pension Plan provisions that would meet NOC's goal of improving the funded status of the plan:

- (i) Early retirement eligibility
- (ii) Best Average Earnings
- (iii) Normal Retirement Age

Justify your response.

ANSWER:

(c) (2 points) Evaluate your proposed changes from part (b) from the perspective of:

- (i) An employee age 25 with 2 years of service
- (ii) An employee age 60 with 20 years of service

No calculations required.

ANSWER:

- 13.** (6 points) Company A sponsors a defined benefit (DB) pension plan that provides an unreduced pension at age 60.

Company A's management has asked their actuary to use a retirement age assumption of 65. Company A's actuary, Tom, protested orally but eventually complied with the request.

- (a) (2 points) Describe how Tom breached the Code of Professional Conduct.

ANSWER:

- (b) (1 point) Recommend an alternative course of action for Tom.

ANSWER:

Another actuary, Jerry, learned of the retirement age assumption and filed a complaint with the Actuarial Board for Counseling and Discipline. In addition to informing Tom of the complaint, Jerry made negative comments to the news media regarding Tom's work.

- (c) (2 points) Describe how Jerry breached the Code of Professional Conduct.

ANSWER:

- (d) (1 point) Recommend an alternative course of action for Jerry.

ANSWER:

****END OF EXAMINATION****