

Exam RETDAU

Date: Friday, October 28, 2022

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 12 questions numbered 1 through 12 with a total of 100 points.

The points for each question are indicated at the beginning of the question. Question 2 pertains 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.

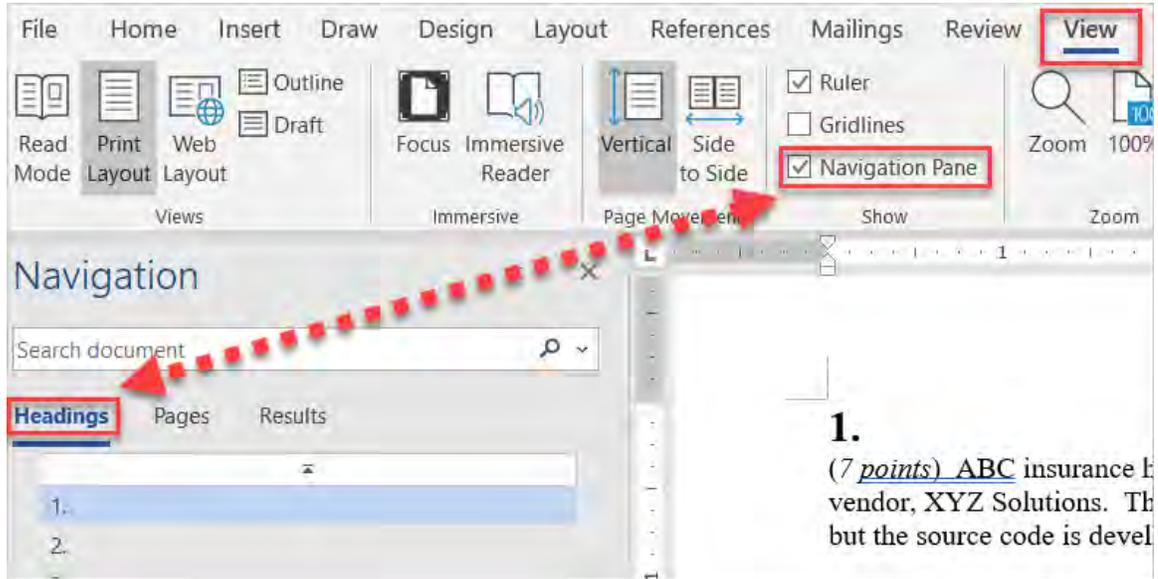
Written-Answer Instructions

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. Prior to uploading your Word and Excel files, each file should be saved and renamed with your five-digit candidate number in the filename.
4. The Word and Excel files that contain your answers must be uploaded before the five-minute upload period expires.

Navigation Instructions

Open the Navigation Pane to jump to questions.

Press Ctrl+F, or click View > Navigation Pane:



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
 - 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.
 - Best practice is to write out the formulas in words, which demonstrates understanding and may result in earning partial 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.

(8 points)

(a) (3 points) Compare and contrast the single lump sum and partial withdrawal distribution options from a defined contribution plan from the perspective of:

- (i) Plan sponsor
- (ii) Plan participants

ANSWER:

(b) (3 points) Compare and contrast the installment payment program and annuity distribution options from a defined contribution plan from the perspective of:

- (i) Plan sponsor
- (ii) Plan participants

ANSWER:

(c) (2 points) Describe considerations for a plan sponsor's evaluation of defined contribution plan distribution options.

ANSWER:

Question 2 pertains to the Case Study.

2.

(8 points) A pandemic is sweeping through Gevrey with the following characteristics:

- Symptoms of the virus range from mild cold-like symptoms to severe illness and death
- Initial evidence implies some of the afflicted will continue to have long-term medical issues
- The elderly and those with existing respiratory or immune conditions are most vulnerable, but all demographic groups are affected
- Many people are delaying non-emergency medical care
- There is significant economic disruption

(a) (2 points) Describe two ways the pandemic may affect expected trend in future medical costs for the National Oil Retiree Health Benefit Program (RHBP).

ANSWER:

(b) (2 points) Recommend two other RHBP valuation assumptions to consider adjusting due to the pandemic.

Justify your response.

ANSWER:

2. Continued

Due to the pandemic, the following changes have been made to the RHPB effective July 1, 2022:

- Retirees and their spouses are required to pay premiums equal to 30% of per capita claims costs
- The life insurance benefit is reduced by 30% for all participants
- Retirees who elect not to pay the premium do not receive health or life insurance benefits

NOC assumes this plan change will reduce participation rates for current and future retirees to 80%. No other assumption changes or gains and losses have occurred.

- (c) (4 points) Calculate the revised 2022 Net Periodic Postretirement Benefit Cost under U.S. Accounting Standard ASC 715.

Show all work.

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

3.

(9 points) Company ABC is a multinational company with globally mobile employees on work assignments outside of their home country. These assignments fall under the following categories:

- Short Term – Assignment for less than 1 year
- Temporary – Assignment between 1 and 5 years
- Permanent (Global Nomads) – Assignment for more than 5 years

(a) (4 points) Describe the advantages and disadvantages of continuing to participate in the home country pension plan in lieu of the host country plan from the perspective of an employee on the following assignments:

(i) Short Term

(ii) Permanent

ANSWER:

(b) (2 points) Explain the rationale behind establishing an International Pension Plan (IPP) under a Trust.

ANSWER:

(c) (3 points) Critique the option of providing cash in lieu of an IPP for employees on Temporary Assignment from the perspective of the employer.

ANSWER:

4.

(7 points)

- (a) (2 points) Describe how redistributions occur among defined benefit pension plan participants with employee contributions and accrual rates which:
- (i) Do not vary with age
 - (ii) Vary with age

ANSWER:

- (b) (3 points) Describe how the characteristics of the following pension arrangements affect risk sharing between the plan participants and plan sponsor:
- (i) Traditional defined benefit plan
 - (ii) Cash balance plan
 - (iii) Collective defined contribution plan

ANSWER:

- (c) (2 points) List the criteria used to assess the effectiveness of hybrid plans.

ANSWER:

5.

(8 points)

- (a) (2 points) Describe the short-term impact of an upward sloping and downward sloping yield curve on the Net Periodic Pension Cost under U.S. Accounting Standard ASC 715 (ASC 715) using the following:
- (i) Traditional Approach
 - (ii) Spot Rate Approach

No calculations required.

ANSWER:

You have been provided a set of cash flows and spot rates in the Excel spreadsheet for a pension plan with frozen benefit accruals. All cash flows are made at the end of the year.

- (b) (6 points) Calculate the following using both the Traditional and Spot Rate Approaches:
- (i) Projected Benefit Obligation under ASC 715
 - (ii) Interest Cost under ASC 715
 - (iii) Equivalent discount rates that would be disclosed in the ASC 715 report

Show all work.

<i>The response to this part is to be provided in the Excel spreadsheet.</i>
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6.

(7 points)

(a) (4 points) Describe how the following SERP plan provisions can be designed to improve executive recruitment and retention:

- (i) Eligibility
- (ii) Vesting
- (iii) Benefit formula
- (iv) Service

ANSWER:

(b) (2 points) Describe timing requirements under Internal Revenue Code section 409A for the following:

- (i) Contributions
- (ii) Benefit distribution

ANSWER:

(c) (1 point) List four events that could trigger a SERP payment under Internal Revenue Code section 409A.

ANSWER:

7.

(11 points) Unions representing employees in the same industry participate in a multi-employer pension plan (MEPP) with the following plan provisions:

Provision	Defined Benefit MEPP
Normal Retirement Age	Age 62
Benefit Formula	1.5% of final average earnings (last 60 consecutive months of base earnings) times years of service
Contribution	Employer: \$6 per hour Employee: none
Early Retirement Benefit	Reduced by 0.25% per month when retirement precedes the Normal Retirement Age
Form of Benefit	Life guaranteed for 10 years
Optional Forms of Benefit	Lump sum
Post-Retirement Indexing	Benefits indexed at 2/3 inflation

- (a) (4 points) Compare and contrast the plan provisions to those of a traditional MEPP.

ANSWER:

The Board of Trustees would like to reduce risk and volatility by aligning the plan provisions with a traditional MEPP.

- (b) (3 points) Recommend four changes to the plan provisions to meet the Board's objectives.

Justify your response.

ANSWER:

- (c) (4 points) Propose four adverse scenarios to measure risks inherent in MEPPs.

Justify your response.

ANSWER:

8.

(8 points)

- (a) (3 points) Describe the following types of pension plans for government employees that combine elements of defined contribution and defined benefit plans:
- (i) Vertical Hybrid
 - (ii) Horizontal Hybrid
 - (iii) Choice Scheme

ANSWER:

You are given the following information for a non-contributory pension plan with immediate eligibility that offers the following three options:

Option	Formula
Defined benefit (DB)	Career average pension of 1% of income for each year of service payable at age 65
Defined contribution (DC)	Accumulated contributions of 8% of salary per year
Hybrid	Career average pension of 0.5% of income for each year of service payable at age 65 plus accumulated contributions of 5% of salary per year before age 50 and 2% thereafter

You are provided with the following assumptions:

Annual investment rate of return	4%
Annual salary increase rate	1%
Annual accrual and contribution limits	None
Annuity factor at age 65	14.0
Pre-retirement mortality for hybrid and DB	None
Timing of hybrid and DC contributions	End of year

- (b) (5 points) Assess which option is the most advantageous for a new hire age 45 based on the assumptions provided.

Show all work and justify your response.

<i>The response to this part is to be provided in the Excel spreadsheet.</i>
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9.

(11 points) Company ABC sponsors a defined benefit plan for its hourly union population and a defined benefit plan for its salaried non-union population. Company ABC is considering merging the two plans.

- (a) *(3 points)* Describe three advantages and three disadvantages of merging the two plans from the perspective of Company ABC.

ANSWER:

9. Continued

The Hourly Pension Plan and Salaried Pension Plan are legally merged effective December 31, 2022.

You are given the following:

	Hourly Pension Plan	Salaried Pension Plan
January 1, 2022 Information		
Projected Benefit Obligation	\$1,200,000	\$2,900,000
Fair Value of Assets	1,300,000	\$2,700,000
Service Cost	\$100,000	\$300,000
Unrecognized Prior Service Cost	\$30,000	\$100,000
Prior Service Cost Amortization	\$3,500	\$8,000
Unrecognized (Gain)/Loss	\$(300,000)	\$700,000
Average future working lifetime	10.0	10.0
January 1, 2023 Funded Status		
Projected Benefit Obligation	\$1,100,000	\$3,000,000
Fair Value of Assets	\$1,400,000	\$2,850,000
Service Cost	\$125,000	\$360,000
Average future working lifetime	10.0	10.0
Expected Benefit Payments		
2022	\$150,000	\$250,000
2023	\$160,000	\$275,000
Expected Contributions		
2022	\$50,000	\$0
2023	\$0	\$0
Additional Information		
Discount Rate at 1/1/2022	2.50%	3.00%
Discount Rate at 1/1/2023	2.60%	
Expected Return on Assets	6.50%	6.50%
Market-related value of assets method	Fair Value	Fair Value
Timing of Benefit Payments	Mid-Year	Mid-Year
Timing of Contributions	Mid-Year	Mid-Year

9. Continued

- (b) (5 points) Calculate the 2023 Net Periodic Pension Cost under U.S. Accounting Standard ASC 715 (ASC 715) for the merged plan.

Show all work.

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

Effective March 31, 2023, Company ABC purchases an annuity buy-out for the retirees in the merged plan.

You are given the following:

	March 31, 2023
Projected Benefit Obligation prior to annuity buy-out	\$4,250,000
Fair Value of Assets prior to annuity buy-out	\$4,300,000
Retiree Only Projected Benefit Obligation	\$800,000
Retiree Annuity Purchase Premium	\$820,000
Additional Information	
Discount Rate	2.60%
There are no other gains or losses as of March 31, 2023.	

- (c) (3 points) Calculate the settlement charge/(credit) under ASC 715 due to the retiree annuity buy-out as of March 31, 2023.

Show all work.

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

10.

(7 points)

- (a) (2 points) Describe the risk-sharing features of the Association of Canadian Pension Management Target Benefit Plan concept (TBP).

ANSWER:

- (b) (2 points) Describe the shortcomings of traditional defined contribution plans and traditional defined benefit plans when compared to TBP.

ANSWER:

- (c) (3 points) Explain how the different components of mortality risk are shared between plan participants and the plan sponsor in the following:

- (i) Traditional defined contribution plans
- (ii) Traditional defined benefit plans
- (iii) TBP

ANSWER:

11.

(7 points)

- (a) (3 points) Compare and contrast the advantages of a cash balance plan and a defined contribution plan from the following perspectives:
- (i) Plan sponsor
 - (ii) Plan participant

ANSWER:

Company ABC sponsors a cash balance plan. You are given the following for a sample participant:

- The participant will be retiring December 31, 2022
- The historical salary has been provided in the Excel spreadsheet
- The cash balance plan grants a pay credit each year until retirement equivalent to 5.0% of pay (pay credits are assumed to be made at the end of the year)
- Interest crediting rates are based on actual rate of return on aggregate plan assets (which are provided in the Excel spreadsheet).

- (b) (2 points) Calculate the value at the sample participant's retirement of the following:
- (i) Enhanced money-back guarantee based on a minimum annual rate of 1%
 - (ii) Enhanced money-back guarantee based on a cumulative floor of 3% per year

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

- (c) (2 points) Describe considerations for setting assumptions to value embedded options in a cash balance plan for actuarial valuation purposes.

ANSWER:

12.

(9 points)

- (a) (3 points) Describe considerations when determining if a model meets its intended purpose under Actuarial Standard of Practice No. 56, Modeling (ASOP 56).

ANSWER:

- (b) (3 points) Identify the guidance for setting assumptions for models under ASOP 56.

ANSWER:

- (c) (3 points) Describe how an actuary can mitigate model risk under ASOP 56.

ANSWER:

****END OF EXAMINATION****