

Exam RETDAU

Date: Friday, April 28, 2023

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 11 questions numbered 1 through 11 with a total of 80 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.

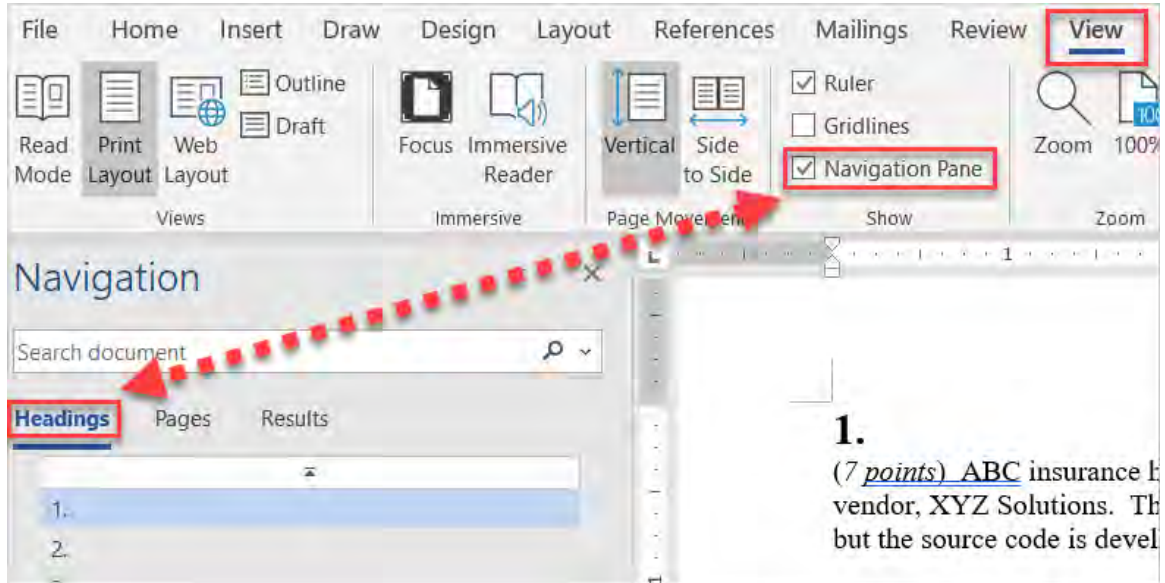
Written-Answer Instructions

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 time 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) Company XYZ sponsors a final average earnings defined benefit pension plan (DB plan).

The DB plan is frozen for both service and pay and replaced with a defined contribution plan (DC plan) for future accruals.

You are given the following:

	Participant A	Participant B
Age at freeze date	60	25
Service at freeze date	25	3

(a) (6 points) Compare and contrast three risks faced by both participants.

ANSWER:

(b) (2 points) Describe provisions that can be included in a DC plan to improve post-retirement income adequacy.

ANSWER:

Question 2 pertains to the Case Study

2.

(8 points) You are the actuary for NOC preparing the 2023 expense for the National Oil Pension Plan and National Oil Retiree Health Benefit Program under U.S. Accounting Standard ASC 715. NOC selected all of the assumptions used in the valuation as noted in the case study after you shared the following observations with them:

- High quality corporate bond yields at the valuation date were 5.735%.
- Long term expected real returns for each asset class are as follows:

Equity	9%
Fixed Income	6%
Real Estate	10%
Cash	3%

- The Pri-2012 mortality table is the most recent mortality table available.
- There have been liability gains due to mortality experience during the last 3 years which can be linked to a recent pandemic. Since the pandemic ended, experts agree that Gevrey is expected to see mortality similar to 2012 for the foreseeable future.
- There have been liability gains of at least 2% for each of the past 5 years due to turnover experience.
- There have not been significant liability gains or losses from retirement.
- There has been no recent analysis on claims cost.

2. Continued

- (a) (6 points) Develop the assumption rationale required to be included in the disclosure reports under Actuarial Standards of Practice No. 27, Selection of Economic Assumptions for Measuring Pension Obligations and No. 35, Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations for the following assumptions:
- (i) Discount rate
 - (ii) Expected return on assets
 - (iii) Mortality
 - (iv) Turnover
 - (v) Retirement age
 - (vi) Per capita claims cost

ANSWER:

The auditor asked for the information used to support the valuation assumptions.

- (b) (2 points) Recommend a response under the guidelines outlined in Actuarial Standards of Practice No. 21, Responding to or Assisting Auditors or Examiners in Connection with Financial Audits, Financial Reviews and Financial Examinations.

ANSWER:

3.

(7 points)

- (a) (3 points) Explain the concept of an economic benefit under IFRIC Interpretation 14: IAS 19 – The Limit on a Defined Benefit Asset, Minimum Funding Requirements and their Interaction.

ANSWER:

- (b) (1 point) List the considerations used to test whether an entity has an unconditional right to a refund under International Accounting Standard IAS 19, Rev. 2011 (IAS 19).

ANSWER:

- (c) (3 points) Describe the disclosure requirements under IAS 19 for defined benefit pension plans.

ANSWER:

4.

(7 points) You are the actuary for Company ABC, which sponsors a frozen defined benefit pension plan. Company ABC is interested in conducting a mortality credibility study for the plan and has asked you to calculate an experience adjustment to the plan's current mortality assumption, a standard base mortality table.

- (a) (2 points) Propose the data items to collect for the mortality study.

Justify your response.

ANSWER:

The table below represents the observed experience.

	2018	2019	2020	2021	2022	Total
Actual deaths	10	20	30	90	90	240
Expected deaths based on current mortality assumption	25	25	25	25	25	125
Number of deaths on a counts-weighted basis for full credibility	N/A	N/A	N/A	N/A	N/A	1,022
Number of deaths on a benefits-weighted basis for full credibility	N/A	N/A	N/A	N/A	N/A	1,245

Company ABC has inquired about limiting the experience period to 2021-2022.

- (b) (3 points) Recommend a response to Company ABC's inquiry.

Justify your response.

ANSWER:

4. Continued

Company ABC has decided to use all five years of mortality experience.

- (c) (2 points) Derive the multiplier to be applied to the standard table base rates based on credibility theory.

Show all work.

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

5.

(10 points)

Municipality ABC sponsors a defined benefit pension plan with the following provisions:

Plan Structure	Three-year final average earnings with employee contributions
Cost of Living Adjustment (COLA)	Full inflation
COLA Eligibility	Participants who have attained age 65 and been retired for ten years

After a decade of annual inflation of 2% or less, in one year inflation increases to 9%.

- (a) (4 points) Describe the impact of the current inflationary environment on the following stakeholders of Municipality ABC’s pension plan.
 - (i) Society/taxpayers
 - (ii) Municipality ABC
 - (iii) Current and future plan participants

ANSWER:

- (b) (4 points) Propose two alternative COLA structures that result in more equitable sharing of the inflation risk among current retirees, future retirees, and Municipality ABC.

Justify your response.

ANSWER:

5. Continued

(c) (2 points) Describe how changing from a defined benefit structure to a defined contribution structure would impact the inflation risk faced by the following stakeholders:

(i) Current and future plan participants

(ii) Society/taxpayers

ANSWER:

6.

(4 points)

- (a) *(3 points)* Compare and contrast the accounting implications of an annuity buy-in under International Accounting Standards IAS 19, Rev 2011 (IAS 19) versus U.S. Accounting Standard ASC 715 (ASC 715).

No calculations required.

ANSWER:

- (b) *(1 point)* Describe the accounting implications of converting an annuity buy-in to an annuity buy-out under both IAS 19 and ASC 715.

No calculations required.

ANSWER:

7.

(9 points)

- (a) (3 points) Identify the design and governance characteristics of a traditional multiemployer pension plan (MEPP).

ANSWER:

- (b) (3 points) Compare and contrast participation in a MEPP and a single employer defined contribution pension plan from the perspective of the plan participants.

ANSWER:

- (c) (3 points) Propose three ways a Board of Trustees could mitigate financial risks in a fully funded MEPP with a significant retiree population.

Justify your response.

ANSWER:

8.

(6 points) A plan sponsor wants to add a variable annuity provision to its career average defined benefit pension plan.

- (a) (2 points) Describe how a variable annuity provision works.

ANSWER:

- (b) (2 points) Describe two methods for adjusting accrued benefits payable under a variable annuity provision.

ANSWER:

- (c) (2 points) Explain the impact of adding a variable annuity provision on the following:

- (i) Investment risk
- (ii) Valuation of liabilities

ANSWER:

9.

(8 points) Company ABC sponsors a defined benefit pension plan.

You are provided the following as of January 1, 2023:

Discount Rate	3.30%
Expected Return on Assets	5.30%
Projected Benefit Obligation (PBO):	
Non-Retiree	\$73,760,000
Retiree	\$90,127,000
Market Value of Assets	\$157,759,000
Service Cost	\$2,652,000
2023 Expected Benefit Payments	\$9,288,000
2023 Expected Contributions	\$2,245,000

Gains and losses are recognized immediately in the period in which they arise. Assume benefit payments and contributions are uniformly distributed.

- (a) (2 points) Calculate the 2023 Net Periodic Pension Cost under U.S. Accounting Standard ASC 715 (ASC 715).

Show all work.

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

Company ABC purchases buy-out annuities for all retirees.

You are given the following as of July 1, 2023:

Discount Rate	3.00%
Duration:	
Non-Retiree PBO	16
Retiree PBO	11
Service Cost	22
Market Value of Assets	\$159,374,000
Annuity Purchase Price	\$97,290,000

No participants are expected to decrement during 2023. All other data and assumptions remain the same as January 1, 2023.

9. Continued

(b) (4 points) Calculate the following values under ASC 715 reflecting the annuity buy-out:

- (i) 2023 Net Periodic Pension Cost
- (ii) 2023 Other Comprehensive Income

Show all work.

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

(c) (2 points) Describe how the values in part (b) would change if the transaction was an annuity buy-in rather than an annuity buy-out.

No calculations required.

ANSWER:

10.

(8 points)

- (a) (2 points) Explain the advantages and disadvantages from an employer's perspective of merging defined contribution plans.

ANSWER:

Company A and Company B are merging. Both companies sponsor defined contribution pension plans.

You are given the following:

Plan Provision	Company A	Company B	Merged Plan (Proposed)
Employee required contributions	Between 1% and 4% of salary	Fixed 3% of salary and bonus	Fixed 4% of salary and bonus
Employee additional voluntary contributions	None	Up to 10% of salary and bonus	Up to 8% of salary and bonus
Employer matching as a percent of employee required contributions	75%	100%	100%
Eligibility	Immediate	After 1 year	After 1 year
Vesting	Immediate	After 2 years	After 1 year
Auto-enrollment	No	Yes	Yes
Default investment option	Balanced fund	Target date fund	Balanced fund
Earliest retirement age	50	55	50
Default payment option	Variable annuity	Account withdrawals	Variable annuity

10. Continued

- (b) (6 points) Critique the merged plan provisions from the perspective of:
- (i) A highly compensated employee from Company A
 - (ii) The Vice President of Human Resources focused on retention
 - (iii) The CFO focused on cost containment

ANSWER:

11.

(5 points)

- (a) (2 points) Identify reasons why the prevalence of employer-sponsored post-retirement health care programs has declined over the past several years.

ANSWER:

- (b) (3 points) Compare and contrast three types of employer subsidy caps to a post-retirement health care program to contain future cost increases.

ANSWER:

****END OF EXAMINATION****