SOCIETY OF ACTUARIES®

Design & Accounting Exam – U.S.

Exam RETDAU

Date: Friday, April 25, 2025

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 10 questions numbered 1 through 10 with a total of 80 points.

    The points for each question are indicated at the beginning of the question. Questions 2, 7 and 10 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.
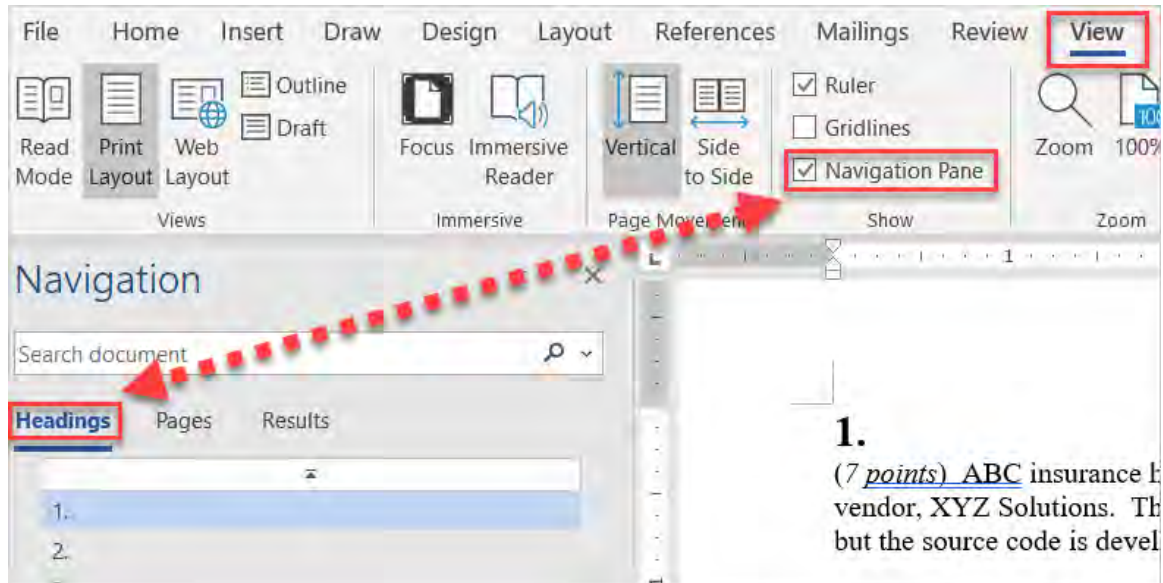
Written-Answer Instructions

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. Prior to uploading your Word and Excel files, each file should be saved and renamed with your unique candidate number in the filename. To maintain anonymity, please refrain from using your name and instead use your candidate number.

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.

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 the 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.

(*6 points*)

(a)   (*2 points*) Describe the advantages and disadvantages to employees participating in the following:

   (i)   Defined benefit pension plan (DB)

   (ii)   Defined contribution pension plan (DC)

   ANSWER:

(b)   (*2 points*) Describe the challenges a company encounters when transitioning from a DB to a DC plan.

   ANSWER:

(c)   (*2 points*) Develop a plan for communicating the transition from a DB to a DC plan to employees.

   ANSWER:

2.
(*7 points*)

(a)   (*3 points*) Compare and contrast the considerations for setting the following
        assumptions for a pension plan versus a retiree health benefit program.

        (i)   Termination of employment

        (ii)   Retirement

        > ANSWER:

(b)   (*2 points*) Describe the three building-block components of the salary scale
        assumption.

        > ANSWER:

> ***Question 2.(c) pertains to the Case Study.***

(c)   (*2 points*) Critique the salary scale assumption used for the National Oil Pension
        Plan.

        > ANSWER:

3.

(*7 points*)

(a)   (*2 points*) Describe four risks inherent in a Multi-Employer Pension Plan (MEPP) from an employer's perspective.

> ANSWER:

(b)   (*3 points*) Recommend a way to mitigate each of the risks identified in part (a).

> ANSWER:

(c)   (*2 points*) Explain how the funded status of a MEPP could impact union negotiations between an employer and the union.

> ANSWER:

4.

(*8 points*)

(a) (*3 points*) Describe three ways to structure a cost-of-living adjustment provision for a defined benefit (DB) pension plan to share risk between the employer and retirees.

ANSWER:

(b) (*2 points*) Describe three ways to structure benefit accruals in a DB pension plan to share risk between the employer and employees.

ANSWER:

(c) (*3 points*) Describe three risk-sharing methods for dividing contributions between the employer and employees in a DB pension plan.

ANSWER:

5.

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

You are provided the following information.

	At December 31, 2023	At December 31, 2024
Discount rate	4.50%	4.00%
Expected return on assets	5.75%	5.25%
Fair value of assets	$53,500,000	$57,800,000
Market related value of assets	$52,500,000	$57,000,000
Projected benefit obligation (PBO)		
Active members	$34,000,000	$39,500,000
Deferred members	$6,000,000	$7,500,000
Retired members	$25,000,000	$27,500,000
Total PBO	$65,000,000	$74,500,000
Current service cost at January 1 of the following fiscal year	$1,300,000	$1,500,000
Expected employer contributions for the following fiscal year	$900,000	$950,000
Expected benefit payments for the following fiscal year	$1,200,000	$1,250,000
Expected average remaining service lifetime (EARSL)	10.0	10.5
Amortization method	10% corridor	10% corridor
Unrecognized (gain)/loss in accumulated other comprehensive income (AOCI)	$8,500,000	

Contributions and benefit payments are made uniformly throughout the year.

(a)   (*3 points*) Calculate the following under U.S. Accounting Standard ASC 715 (ASC 715):

(i)   2024 Net Periodic Pension Cost

(ii)   AOCI as of December 31, 2024

Show all work.

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

5. **Continued**

On January 1, 2025, Company ABC approved an increase in the flat benefit rate from $100 to $110 per month per year of credited service, effective immediately and applicable to all credited service for active members.

Assume there is no change in the discount rate, expected contributions, and benefit payments for fiscal year 2025.

(b)   (*5 points*) Calculate the following:

(i)   2025 Net Periodic Pension Cost under ASC 715

(ii)   2025 Defined Benefit Cost recognized in profit or loss under International Accounting Standard IAS 19, Rev. 2011 (IAS 19)

Show all work.

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

6.

(*13 points*) Company XYZ sponsors a defined benefit pension plan and reports under both U.S. Accounting Standard ASC 715 (ASC 715) and International Accounting Standard IAS 19, Rev. 2011 (IAS 19).

You are given the following as of January 1, 2025:

Projected Benefit Obligation	$32,824,000
Fair Value of Assets	$35,313,000
Service Cost	$299,000
Discount Rate	4.50%
Expected Return on Assets	5.50%
2025 Expected Benefit Payments	$1,634,000
2025 Expected Contributions	$336,000
Timing of Benefit Payments and Contributions	Mid-Year
Unrecognized Prior Service Cost (established January 1, 2021)	$63,000
Prior Service Cost Amortization	$5,000
Unrecognized (Gains)/Losses	($8,733,000)
Amortization Method	10% corridor
Average Future Working Lifetime	14

(a)   (*4 points*) Calculate the following:

(i)   2025 Net Periodic Pension Cost under ASC 715

(ii)   2025 Defined Benefit Cost recognized in profit and loss under IAS 19

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

6. Continued

Company XYZ purchases an annuity buy-out for the retirees in the plan effective December 31, 2025.

You are provided the following as of December 31, 2025:

Discount Rate	5.00%
Projected Benefit Obligation:	
Non-Retiree	$19,099,000
Retiree	$12,732,000
Fair Value of Assets	$34,474,000
Annuity Premium	$13,378,000

There are no other gains or losses as of December 31, 2025.

(b) (*6 points*) Calculate the following under ASC 715 reflecting the annuity buy-out:

   (i)   Funded Status at December 31, 2025

   (ii)   Revised 2025 Net Periodic Pension Cost

   (iii)   Accumulated Other Comprehensive Income at December 31, 2025

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

(c) (*3 points*) Describe how the following would be impacted if the company had done an annuity buy-in instead of an annuity buy-out at December 31, 2025 under ASC 715.

   (i)   Fair Value of Assets

   (ii)   Projected Benefit Obligation

   (iii)   2025 Net Periodic Pension Cost

   (iv)   2026 Net Periodic Pension Cost

   No calculations required.

   > ANSWER:

7.

(*9 points*)

(a)   (*1 point*) Describe how NOC and the participants of the NOC Retiree Health
        Benefit Program are impacted by healthcare inflation risk.

> ANSWER:

The government of Gevrey has announced it is implementing a state-provided
prescription drug benefit starting in 2030. The program has the following provisions:

- Eligibility from age 65 with 10 years of service in Gevrey
- Prescription drugs covered at 80% up to an annual maximum of $10,000

(b)   (*4 points*) Describe how the new state-provided prescription drug benefit may
        affect the expected future medical costs for the National Oil Retiree Health
        Benefit Program.

> ANSWER:

(c)   (*4 points*) NOC wants to mitigate the impact of rising health care costs and
        integrate the new state-provided prescription drug benefit into the National Oil
        Retiree Health Plan. Recommend four plan design changes.

        Justify your response.

> ANSWER:

8.

(*8 points*) A defined contribution pension plan has the following provisions:

Employee contributions	Optional up to a maximum of 5% of base salary
Employer contributions	50% match of employee contributions during first 10 years; 100% match thereafter
Eligibility	After 1 year of service
Vesting	2 years of eligibility
Pre-retirement withdrawals	One-time, up to 25% of assets
Investments	One investment option with an expected return of 4%, gross of investment management fees
Investment management fees	1% of assets per year

(a)   (*4 points*) Explain the retirement income risks inherent in the plan design from the perspective of the plan participants.

> ANSWER:

(b)   (*4 points*) Recommend changes to the plan that reduce retirement income risk while minimizing the cost impact to the plan sponsor.

Justify your response.

> ANSWER:

9.

(*6 points*) Firefighters and administrative staff participate in the same public sector target benefit plan (TBP) with the following plan provisions:

Normal Retirement Age	Age 65
Early Retirement Benefit	Actuarially equivalent to normal retirement benefit
Benefit Formula	1.4% of five-year final average earnings times years of service
Employee Contribution	2% of earnings
Form of Benefit	5 year certain and life annuity
Postretirement Indexation	None

(a)   (*3 points*) Describe three risks of the TBP and how they affect the plan sponsor and members.

> ANSWER:

The plan sponsor proposes amending the plan to allow active firefighters to retire with an unreduced benefit after 25 years of service ("25-and-out"). To fund the added cost, the plan sponsor also proposes increasing the employee contribution to 5% of earnings for all active employees, both firefighters and administrative staff.

(b)   (*3 points*) Critique this proposal from the perspective of the plan sponsor and plan members.

> ANSWER:

10.

(*8 points*)

(a)   (*3 points*) Compare and contrast the following funding options for supplemental retirement plans (SRP) for executives:

    (i)   Corporate Owned Life Insurance

    (ii)   Company Stock

    (iii)   Cash

> ANSWER:

Question 10. (b) pertains to the Case Study.

National Oil Company is considering adding an SRP for its executives to accomplish the following objectives:

- Provide a career executive with a replacement ratio similar to a lower paid career employee

- Attract mid-career executives

- Retain executives until retirement

(b)   (*5 points*) Recommend an SRP plan design that meets NOC's objectives.

Justify your response.

> ANSWER:

END OF EXAMINATION