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**SOCIETY OF ACTUARIES**  
**Design & Accounting Exam – U.S.**

# Exam RETDAU

## MORNING SESSION

**Date:** Thursday, November 3, 2016

**Time:** 8:30 a.m. – 11:45 a.m.

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### 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 7 questions numbered 1 through 7.
  - b) The afternoon session consists of 6 questions numbered 8 through 13.

The points for each question are indicated at the beginning of the question. Questions 3 and 7 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 RETDAU.
6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.



## **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) Company ABC sponsors a defined contribution plan.
- (a) (2 points) Describe the following risks from the perspectives of the participants and Company ABC:
- Investment risk
  - Retirement risk
  - Longevity risk
- (b) (3 points) Explain how each of the Retirement Income Generators listed below addresses the longevity risk the participants face:
- Managed payout fund
  - Immediate fixed income annuity
  - Longevity insurance

2. (8 points) An individual, who is not covered by an employer-sponsored pension plan, must rely on personal savings as his primary source of retirement income. The individual is considering one of the following options after retirement:

Option 1: Continue to manage his investments and annual payouts himself.

Option 2: Use all of his personal savings to buy an immediate lifetime annuity.

- (a) (2 points) Describe the advantages and disadvantages of each option from the perspective of the individual.
- (b) (3 points) Explain other options that the individual may want to consider to mitigate the following post-retirement risks:
  - (i) Inflation
  - (ii) Interest
  - (iii) Stock market
- (c) (3 points) You are given the following:

Annual gross pre-retirement income: \$90,000

Annual Gross Taxes	Pre-Retirement	Post-Retirement
Social Security	\$7,000	\$0
Federal Income	\$10,000	\$4,000
State Income	\$2,000	\$1,000

Annual pre-retirement savings as a percentage of income after taxes: 6%

Annual Expenditures	Pre-Retirement	Post-Retirement
Utilities, Household Operations and Shelter	\$16,000	\$14,000
Health Care	\$3,000	\$4,000
All Other	\$23,000	\$22,000

Estimated annual social security benefit: \$33,000

Calculate the required replacement ratio, excluding social security benefits, using the Expenditure, Tax and Savings model.

Show all work.

**Question 3 pertains to the Case Study.**

**3.** (10 points) Company XYZ is located in Gevrey and does not currently offer retirement benefits. Company XYZ would like to implement a plan that meets the following goals:

- Attract younger employees
- Provide predictable retirement income for long service employees
- Encourage employees to save their own money for retirement
- Provide valuable benefits with predictable company costs

Company XYZ is considering the following designs:

Option 1: Create a plan that combines the features of NOC's Full-Time Hourly Union Pension Plan and Part-Time DC Pension Plan.

Option 2: Employer contribution of 5% where Company XYZ guarantees a minimum 4% return; plus a defined contribution feature where employees can contribute up to 10% of earnings with a company match of 50%.

- (a) (5 points) Critique each option with regard to Company XYZ's objectives.
- (b) (2 points) Recommend one of the two plan design options.

Justify your response.

- (c) (3 points) Recommend changes to the design in part (b) to better align with Company XYZ's objectives.

Justify your response.

**4.** (9 points)

- (a) (2 points) Describe the pension plan considerations associated with the following transactions, in the context of corporate mergers and acquisitions:
- (i) Share Purchase Transactions
  - (ii) Asset Purchase Transactions
- (b) (4 points) Describe four options for a buyer with respect to pension plans in an asset purchase transaction and the effect on impacted parties.

The CEO of Company A is considering buying Company B in an asset purchase transaction and is evaluating options she should pursue with respect to retirement benefits for employees at Company B. She wants to ensure a smooth transaction and to treat the transferred employees fairly. Information on the open retirement plans at both companies is as follows:

	Company A	Company B
Pension Plan	Traditional DB	DC
Formula	$1\% \times 3 \text{ year final average pay} \times \text{total service}$	Employer annually contributes 10% of pay
Funded Status	Slightly underfunded	100% funded
Participant Count	25,000	1,000

- (c) (3 points) Recommend a retirement plan option she should pursue for employees of Company B, including how it will impact both Company A and the transferred Company B employees.

Justify your recommendation.

- 5.** (9 points) Company DEF is expanding its operations to other countries and is reviewing options with respect to implementing company-sponsored retirement plans in the new jurisdictions.
- (a) (3 points) Explain why Company DEF may consider establishing an International Pension Plan instead of establishing local/host country pension plans.
  - (b) (6 points) Describe the issues with respect to an International Pension Plan from the perspectives of the employees and Company DEF for each of the following:
    - (i) Design/governance
    - (ii) Tax effectiveness
    - (iii) Funding



**6.** (10 points) An employer is considering implementing one of the following pension plan designs:

Option 1: A traditional defined benefit (DB) final average pay plan.

Option 2: A plan in which earnings up to an inflation-linked threshold are covered by a traditional final average pay DB structure and earnings above that threshold are covered by a defined contribution (DC) structure. At retirement, a participant may receive an annuity from the benefit earned under the DB structure with an option to receive an annuity from the benefit earned under the DC structure.

Option 3: A plan in which the employer pays a fixed contribution toward a DB formula, but the benefit may change periodically based on the funded status of the plan.

Assume the above designs are permissible under the pension legislation applicable to the employer.

Describe the risks of each design from the perspectives of the employer and its employees.

**Question 7 pertains to the Case Study.**

- 7.** (9 points) NOC is evaluating the medical trend assumption for the NOC Retiree Health and Welfare Program.
- (a) (4 points) Describe considerations in determining the medical trend assumption according to Actuarial Standards of Practice and U.S. Accounting Standard (ASC) 715.
- (b) (2 points) Describe the purpose of and inputs required for the Getzen model.
- (c) (3 points) NOC has decided to change the medical trend assumption effective January 1, 2016. You are given the following impacts of updating the medical trend assumption as of January 1, 2016:

	Impact (in 000's)
Increase in Accumulated Postretirement Benefit Obligation	\$125,000
Increase in Service Cost	\$5,000
Increase in Expected Benefit Payments	\$600

Calculate the revised 2016 Net Periodic Benefit Cost under ASC 715.

Show all work.

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

**USE THIS PAGE FOR YOUR SCRATCH WORK**

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