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

Exam RETDAU

MORNING SESSION

Date: Thursday, Oct 31, 2013
Time: 8:30 a.m. – 11:45 a.m.

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 6 questions numbered 1 through 6.

   b) The afternoon session consists of 4 questions numbered 7 through 10.

   The points for each question are indicated at the beginning of the question. Questions 3 and 6 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 since 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. (*8 points*) XYZ Company has acquired its first foreign company with international operations and is evaluating its global benefit objectives.

(a) (*2 points*) Describe four arrangements that XYZ could use to employ workers outside XYZ's home country.

(b) (*2 points*) Explain why XYZ may consider sponsoring an international pension plan.

(c) (*4 points*) Describe the key features of a global benefit policy statement.

2. (*11 points*) ABC Company sponsors a significantly underfunded final average earnings defined benefit pension plan with no early retirement subsidies.

The Human Resources Manager proposes to offer an early retirement window over the next six months to eligible active employees who retire with 25 years of service. The window would have the following features:

- Unreduced early retirement benefit; and
- Lump sum benefit option.

(a) (*4 points*) Describe the impact of the window on the following valuation assumptions:

(i) Salary increases

(ii) Retirement rates

(iii) Termination of employment

(b) (*3 points*) Describe the risks of the plan changes from the perspectives of both the plan sponsor and the eligible employees.

As an alternative, ABC has proposed the following:

- Allow employees to work 50% of their current schedules and receive 60% of their current pay;
- Employees will receive the same pension and non-pension benefits as if they work full-time;
- Employees must be 55 with 10 years of service in order to participate in the program; and
- Employees may work for two years, after which they must retire.

(c) (*4 points*) Critique this proposal from the perspectives of both the plan sponsor and the active employees.

Question 3 pertains to the Case Study.

3. (*12 points*) NOC will terminate 40% of the active employees of the Full-Time Salaried Pension Plan as of December 31, 2013. The plan was amended such that terminated employees will become immediately vested and annuities will be purchased as of December 31, 2013.

It has been determined that both a curtailment and settlement will occur. NOC's accounting policy is to account for curtailments before settlements. You are given the following information:

- Employer contributions, benefit payments and investment return for 2013 have been as expected.
- Employer contributions and benefit payments for 2014 are expected to be the same as for 2013.
- The discount rate is 4.50% per annum as of December 31, 2013.
- Plan expenses are paid outside of the pension plan trust.
- There is a 2013 actuarial experience gain of $130,000,000 for 2013.
- For the employees terminated:
    - The projected benefit obligation immediately before their termination is $575,000,000.
    - The projected benefit obligation is reduced by $175,000,000 when salary projections are removed.
    - The projected benefit obligation increases $25,000,000 as a result of immediate vesting.
    - The purchase price of the annuities is $600,000,000.
    - The 2014 service cost is $25,000,000.
- NOC's expected return on asset assumption for 2014 is 6.75%.
- Average future working lifetime for the remaining active participants at January 1, 2014 is 10 years.

(a) (*9 points*) Calculate the impact of this event on the 2013 pension expense. Show all work.

(b) (*3 points*) Calculate the 2014 pension expense. Show all work.

4. (*10 points*) XYZ Company is considering introducing a pension plan for active employees. The following two options are being considered:

Option 1:

- A defined benefit plan that aims to provide an annual benefit upon retirement determined as a fixed percentage of final average pay per year of service.
- XYZ will fund the plan with contributions equal to 3% of total payroll each year. This contribution level is expected to be sufficient to provide the targeted level of benefits.
- If the plan is underfunded, benefits may be reduced.

Option 2:

- A cash balance plan where XYZ contributes 3% of pay each year for each participant to a notional account.
- The notional account earns interest based on the return of the combined contributions, as invested by XYZ, with a minimum return of 3% per year.
- The notional account balance is paid out as a lump sum to each employee upon termination or retirement.

(a) (*3 points*) Compare and contrast the two plan design options from the employees' perspective with respect to each of the following risks:

(i) Longevity risk

(ii) Inflation risk

(iii) Investment return risk

(b) (*4 points*) Describe the advantages and disadvantages of each plan design option to XYZ.

(c) (*3 points*) XYZ has decided to implement Option 2, but the CEO is concerned with the risks associated with the interest crediting rate design. Propose ways the company can reduce the risks through both plan design and investment strategy.

5. (*12 points*) Employer A participates in XYZ multiemployer defined benefit pension plan and is currently negotiating a new collective bargaining agreement. You have been provided with the following information:

Financial Information

Actuarial Accrued Liabilities:	
Actives	$400,000,000
Deferred vesteds	200,000,000
Regular pensioners	500,000,000
Disabled pensioners	300,000,000
Total	$1,400,000,000
Assets (50% equities, 50% fixed income)	$1,200,000,000
Normal cost, including administrative expenses	$20,000,000
Recommended hourly contribution rate	$8.42

<u>Actuarial assumptions and methods (used in above calculations)</u>:

Recommended hourly contribution rate:	• 5-year amortization of the unfunded actuarial accrued liability and assumed employment levels of 10,000,000 man-hours per year • Includes 20% margin to account for possible future adverse experience.
Average future working lifetime of current actives:	15 years
Actuarial cost method:	Unit credit
Asset valuation method:	Market value of assets
Mortality:	1983 Group Annuity Mortality Table
Retirement:	100% at the first age eligible for an unreduced pension
Pre-retirement decrements:	None besides mortality
Net investment return:	9% per annum
Pension election:	100% of future retirees elect single life annuity

5. Continued

Summary of Plan Provisions:

Benefit accrual:	$100 per year of service payable as a single life annuity
Normal retirement age:	65 years
Unreduced pension:	Any age with at least 25 years of service
Early retirement:	• Age 55 with at least 10 years of service • Pension reduced by 3% for each year under age 65
Disability pension:	• Any age with at least 10 years of service and totally and permanently disabled • Pension unreduced
Service:	At least 800 hours in a calendar year
Pre-retirement lump sum death benefit:	$3,000
Post-retirement lump sum death benefit:	$5,000
Optional forms of payment:	• Unreduced 50% joint and survivor pension • Life annuity with 10 year certain payout reduced based on actuarial equivalence

(a) (*5 points*) Discuss the appropriateness of the actuarial assumptions and methods.

(b) (*3 points*) Identify additional information that may be necessary to perform an independent evaluation of the recommended hourly contribution rate.

(c) (*4 points*) The union representing the employees of Employer A has indicated that it wants to maintain a defined benefit plan.

Recommend alternative ways to redesign the XYZ Plan to lower the recommended hourly contribution rate.

Question 6 pertains to the Case Study.

6. (*7 points*)

(a) (*2 points*) List possible ways of lowering the risk, volatility and costs of defined benefit pension plans resulting in a more sustainable or "Green" program.

(b) (*5 points*) Analyze the impact of adopting a "Green" retirement program for the Full-Time Salaried Pension Plan from the perspectives of both NOC and the plan members.

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