
SOCIETY OF ACTUARIES
Individual Life & Annuities United States – Company/Sponsor Perspective

Exam CSP-IU

AFTERNOON SESSION

Date: Friday, November 2, 2012

Time: 1:30 p.m. – 4:45 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This afternoon session consists of 7 questions numbered 7 through 13 for a total of 60 points. The points for each question are indicated at the beginning of the question.
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.
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 CSP-IU.

Written-Answer Instructions

1. Write your candidate number at the top of each sheet. Your name must not appear.
6. Be sure your essay answer envelope is signed because if it is not, your examination will not be graded.

****BEGINNING OF EXAMINATION****

Afternoon Session
Beginning with Question 7

7. (6 points)

- (a) (2 points) List the key steps a process owner needs to do in order to test an identified control, according to Section 404 of the Sarbanes-Oxley Act.
- (b) (4 points) An actuarial opinion and memorandum prepared by the Appointed Actuary for ABC Life includes the following statements or practices:
- Cash flow testing is always performed.
 - The liability section includes a summary of the reserves held for ABC Life's major products only along with the policy reserve valuation methods used.
 - One or more paragraphs to qualify their opinion which discloses any inconsistencies and the release of additional reserves established in a prior opinion including a brief description of any assumptions on which the opinion is based.
 - A Source of Earnings statement is included.

Assess the appropriateness of each of the above statements or practices as per Sections 6 & 7 of the Actuarial Opinion and Memorandum Model Regulation and Actuarial Standards of Practice No. 22 and what changes, if any, must be incorporated to ensure the Appointed Actuary complies with these regulations and standards of practice. Justify your answer.

8. (7 points) Templar Life Insurance Company is a U.S. company that writes voluntary worksite products with premiums that are normally paid through payroll deduction. High unemployment and economic concerns have resulted in few new policies being sold throughout the current year with the current low interest rates calling into question the assumed investment returns. An actuarial student has prepared the memo below in response to an auditor's request and you are the responding actuary reviewing the memo.

MEMO

To: Auditor
From: Templar Life Insurance Company Actuarial Department
Date: June 1, 2012
Subject: Answers to Your Audit Questions

You asked several questions on March 25, 2012. Here are the answers.

Q1: For long term care and disability lines of business, how has the current high unemployment rate affected claim incidence or termination rates?

Claim incidence tends to increase during periods of economic upheaval or downturn while claim termination rates tend to not change. We hired the same consultant who priced our disability products to also work on our recently introduced long term care product. In both cases, the consultant has never provided the company with the data used, methods used and basis for assumptions. We can't do our own actuarial work or review the consultant's work because of lack of resources and expertise.

Q2: For life and annuity lines of business, how has the current very low interest rate environment affected the profitability of these lines of business?

Business with credited interest rates subject to minimum guarantees will be hurt by low portfolio earnings rates when those minimum guarantees can no longer be supported. A key person just left the company, so we no longer have an expert on accounting rules, laws and regulations. The same person was very knowledgeable on corporate policies and procedures and knew all about sensitivities to the economic environment. Consequently, the effects, even in general of the low interest rate environment are unknown.

8. Continued

Q3: The company recently converted from several administrative systems for all its business to one administrative system for increased operational efficiency. What are the implications for reserve calculations and profitability tracking?

Although enough extracts and other information were created to be able to perform reserve calculations, no report was prepared on reserve discontinuity at the moment of conversion. We simply used the new reserve without any parallel calculation. While some lines of business had significantly higher reserves even on a statutory basis, others were significantly lower. Due to lack of resources, we did not investigate how the extracts might have changed between old and new administrative systems. Also, all the extra reports we previously received out of the old administrative system were not carried over to the new system, so we don't have any ability to continue experience studies related to mortality, morbidity, persistency, or any other variables.

- (a) (5 points) Explain where the memo does not comply with ASOP 21 – Responding to the Auditor, and ASOP 41 – Actuarial Communication.
- (b) (2 points) Recommend changes, if any, in company policy and process regarding ASOP 21 and ASOP 41.

- 9.** (9 points) You are the actuary in charge of life insurance product valuation for ABC Insurance Company, a subsidiary of MegaConglomerate Inc. This year you have been asked to determine the value of ABC's major blocks of life business using fair value accounting.
- (a) (1 point) Define the following as they relate to the determination of fair value of insurance liabilities:
- (i) Principal Market
 - (ii) Most Advantageous Market
- (b) (2 points) Describe the limitations of the following potential markets in consideration of determining the fair value of life insurance products:
- (i) Life insurance company market
 - (ii) Reinsurance market
 - (iii) Capital markets
- (c) (3 points) Identify when and why a customer consideration model could serve as a substitute to an exit price model in the determination of fair value.
- (d) (3 points) ABC recently acquired a large block of term policies from XYZ Insurance Company, another subsidiary of MegaConglomerate, after XYZ exited the term market. Your boss, the Chief Actuary, recommends reporting the fair value as the transaction price, based on it being the most recently observable price for the block and the fact that ABC intends to hold the liability on the books until maturity.
- Critique the Chief Actuary's recommendation.

- 10.** (6 points) Mr. Vandelay deposits 50,000 into a 3-year Fixed Single Premium Deferred Annuity contract that guarantees a credited interest rate of 3.2% for the first 2 years and 1.5% after. During the 3-year period, there is a surrender penalty of 5% in the first year, 2% in the second year and 0% by the end of the 3 year period.

Assume the following:

- Interest rate is credited at the end of each policy year
- The statutory valuation interest rate is 4.0% on an issue year basis
- Death benefit is the cash surrender value
- The contract allows free partial withdrawals up to 2.5% of the fund value each year

Calculate the CARVM reserve, as described in *Valuation of Life Insurance Liabilities*, for Mr. Vandelay's contract at issue. Show all work.

11. (8 points) You are given the following information for a 4-Year level benefit Non-Participating Term Product with a valuation date of December 31, 2011:

Policy Issuance Date	April 1, 2011
Gross Premium	1,500 payable for 3 years at the beginning of each policy year
Death Benefit	75,000 (assume deaths occur at end of year)
Valuation Interest Rate	3.5%
Present Value of Future Benefits at Issue	2,136.93
Age at Issue	45
q_{45}	0.00694
q_{46}	0.00753
q_{47}	0.00805
q_{48}	0.00898

- (a) (5 points) Calculate both the mean and terminal reserves at valuation date using the Net Level premium method assuming the death benefits are paid at the end of the policy year (curtate). Show all work.
- (b) (3 points) Describe, in words, the changes needed to convert reserves calculated on a curtate basis to the following continuous bases:
- (i) Semi-Continuous Reserves
 - (ii) Fully Continuous Reserves
 - (iii) Discounted Continuous Reserves

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12. (13 points) You are a Senior Actuary with XYZ Life Insurance Company and you are reviewing the variance between the financial results of 2010 and 2011 given the information below:

	2009	2010	2011	Variance
Premium				
Gross		160	140	(20)
Net		115	109	(6)
Interest		80	70	(10)
Deaths		16	13	(3)
Surrenders		45	60	15
Reserves				
Stat reserve	110	190	220	
GAAP reserve	107	180	210	
Tax reserve	108	185	215	
Required Capital	10	19	26	
Expenses:				
Deferrable		10	8	(2)
Non-deferrable		25	25	0
Maintenance		10	15	5
DAC Amortization		15	14	(1)
Tax		20	21	1
Interest rate for Required Capital		5%	4.5%	

- (a) (5 points)
- (i) Determine the earnings of XYZ on a GAAP and Statutory Basis for both 2010 and 2011.
 - (ii) Determine the Distributable earnings for both 2010 and 2011.

Show all work.

12. Continued

- (b) (6 points) Your actuarial student has commented that the bulk of the variance in results is attributable to the drop in gross premium of 20M and an increase in surrenders of 15M.

You are given the following additional information about XYZ:

	Planned		Actual	
	2010	2011	2010	2011
Expenses	50	60		
Face Amount	10,000	10,000	10,000	10,000
Cash Surrender Value	188	218	190	220
q_x	0.0020	0.0030	0.0016	0.0013
q_w	0.100	0.110	0.120	0.130
$i(t)$	6.0%	5.5%	5.0%	4.5%

- (i) Perform a Source of Earnings analysis based on Statutory Earnings.
- (ii) Evaluate whether the actuarial student's statement is correct based on your Source of Earnings analysis.
- (c) (2 points)
- (i) Define Embedded Value.
- (ii) Determine the minimum assets that must be transferred at year end 2011 in order to sell the block of business given the Embedded Value at year end 2011 is 50.2M, ignoring transaction costs and taxes. Show all work.

- 13.** (11 points) Sunset is a U.S. life insurance company, with its only business being a closed block of individual fixed deferred annuities. All policies were sold on 1/1/2009 and mature on 12/31/2013.

The only items outstanding to complete the company's 2011 U.S. GAAP financial statements are the year-end DAC balance, and the SFAS 115 shadow adjustments.

You are given the following values from your GAAP model (all values in millions):

Year	Deferrable Acquisition Costs	Estimated Gross Profit (EGP)
2009	500	300
2010	300	1800
2011	100	1700
2012 Projected	100	1200
2013 Projected	0	800

Your assets are as follows at 12/31/2011 (all values in millions):

Asset Category	Market Value	Reported Value
Held to Maturity	500	600
Available For Sale	3,400	3,000
Trading	300	300

Assume:

- Fixed annuity credited rate is 4% for all years.
 - Earned rates of underlying investments is 5% for all years.
 - Acquisitions costs occur at the beginning of the calendar year, and EGPs are as of the end of the calendar year.
 - Deferred annuity contracts are accounted for as SFAS 97 insurance contracts.
 - None of the annuity contracts contain "experience accounting".
 - Claim reserves consist solely of short-term due-and-unpaid amounts and do not include an interest element in their derivation.
 - There are no VOBA, URL or federal income taxes.
- (a) (3 points) Discuss the rationale behind including shadow DAC adjustments in U.S. GAAP Accounting.
- (b) (6 points) Calculate the 12/31/2011 DAC asset prior to the shadow DAC adjustment, and the SFAS 115 shadow DAC adjustment for this block of business.

Show all work.

13. Continued

- (c) (2 points) You have just been notified that a large last-minute maintenance expense is being booked against this line of business for the 2011 financials. Predict how this will affect DAC amortization in calendar year 2011. Justify your answer.

****END OF EXAMINATION****
Afternoon Session

USE THIS PAGE FOR YOUR SCRATCH WORK