SOCIETY OF ACTUARIES

Individual Life & Annuities United States – Company/Sponsor Perspective

Exam CSP-IU

AFTERNOON SESSION

Date: Friday, April 27, 2012
Time: 1:30 p.m. – 4:45 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This afternoon session consists of 6 questions numbered 8 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.

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 CSP-IU.
6. Be sure your essay answer envelope is signed because if it is not, your examination will not be graded.

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****BEGINNING OF EXAMINATION****
Afternoon Session
Beginning with Question 8

8. (*10 points*) You are an actuary at a U.S. Life Insurance Company preparing the company's financial statement in accordance with GAAP for the company's limited pay contract line of business. You are responsible for selecting investment assumptions.

(a) (*3 points*) Describe the guidance in ASOP 10 (*Methods and Assumptions for Use in Life Insurance Company Financial Statements Prepared in Accordance with GAAP*) for:

(i) Best Estimate Assumptions

(ii) Best Estimate Assumption with Provision for Adverse Deviation

(b) (*3 points*) The company is partially through audit planning with a clear understanding of the objective and planning the review in advance.

Explain the remaining principles common to any audit or audit plan.

(c) (*4 points*) The auditor questions why the assumed future portfolio earned rate is 7.00% when the 5-year Treasury interest rate is 0.80%.

Outline the actuary's response to the auditor using the guidance of ASOP 21 (*Responding to or Assisting Auditors or Examiners in Connection with Financial Statements for All Practice Areas*).

9. (*10 points*) Sunset is a U.S. life insurance company that sells individual deferred annuities and individual payout annuities. The only items remaining to complete its current year's U.S. GAAP financial statements are the SFAS 115 shadow adjustments.

Assume:

- The deferred annuity contracts are accounted for as SFAS 97 insurance contracts.
- The payout annuity contracts are accounted for as SFAS 97 limited-payment contracts.
- For purposes of calculating the SFAS 115 shadow adjustments, all deferred annuity contracts are aggregated together and all payout annuity contracts are separately aggregated together.
- 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) (*1 point*) Explain the purpose of the SFAS 115 shadow adjustments.

(b) (*5 points*) According to *U.S. GAAP for Life Insurers*, there are six primary shadow adjustments that a U.S. life insurance company may need to calculate.

Outline the theoretical approach for determining the adjustment and the impact the adjustment has on shareholder equity for each adjustment that Sunset needs to calculate.

9. Continued

(c) (*4 points*) For the current year end, you are given the following information for Sunset prior to the calculation of the shadow adjustments:

GAAP Values (Millions)		
	Deferred Annuities	Payout Annuities
DAC Asset	270	0
Policyholder Liabilities	3,000	700
Assets Supporting Policyholder Liabilities (All Classified as Available for Sale)		
Reported Value	3,000	700
Market Value	3,150	770
Present Value of Future Deferrable expenses	30	0
Present Value of Future Estimated Gross Profits	500	n/a

Supplemental Information (Millions)		
	Deferred Annuities	Payout Annuities
Gross Premium Reserve	2,530	650
Gross Premium Reserve assuming all assets supporting policyholder liabilities are sold and reinvested at current market rates	2,680	720

Calculate Sunset's SFAS 115 shadow adjustments for the current year-end, assuming that Sunset uses the alternative (weighted-average amortization percentage) approach instead of the theoretical approach to calculate the shadow DAC adjustment. Show all work.

10. (*8 points*) SpecialBuy Life Insurance Company offers life insurance products through special distribution channels and tracks the financial performance of these channels. One of the channels, EasyUL, offers only level benefit option Universal Life insurance.

(a) (*3 points*) You have been asked to review the statutory reserves for this block of UL policies. SpecialBuy's financial reporting team produces Annual Statement pages for each distribution channel. You just received selected EasyUL's Annual Statement pages with actuarial reserves for the past three years.

Identify which statements, schedules or exhibits you would request for this review and the type of actuarial reserve reported in each.

(b) (*1 point*) State the formula that the Analysis of Increase in Reserves During the Year is based on, including definitions for all variables used.

(c) (*4 points*) Exhibits of Life Insurance for EasyUL from the past three years have also been included.

(i) Explain possible ways to analyze the trend in reserves.

(ii) Explain the impact of no new business for the past three years on the reserve trend analysis.

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11. (*13 points*) You are the valuation actuary at Big Sky Life, a U.S. life insurance company, and you are evaluating a block of business which consists of 1,000 policies, all issued on 5/1/2010.

You are given the following product information:

Product: 10-year endowment
Face amount per policy: 100,000
Premium mode: quarterly
Premium due at the beginning of the period
Valuation date: 12/31/2011

You are given the following valuation information as of the end of Policy Year 1 (amounts in thousands):

GAAP Terminal Benefit Reserve:	8,401.20
Stat Terminal Reserve:	10,000
Gross Premium Inforce:	9,500
GAAP Benefit Net Premium:	6,495.15
Stat Net Premium:	9,025

You are given the following valuation information as of 12/31/2011 (amounts in thousands):

DAC balance	7,500
PV of future benefits & expenses using best estimate assumptions	60,000
PV of future gross premium using best estimate assumptions	45,000

(a) (*3 points*) Big Sky Life reports statutory reserves using the mean reserve approximation method.

Calculate statutory reserve liability and deferred premium asset as of 12/31/2011. Show all work.

11. **Continued**

(b) (*7 points*) Big Sky Life reports GAAP reserves using the mid-terminal approximation method.

(i) Perform a loss recognition test for this block using 12/31/2011 valuation. Show all work

(ii) Determine whether this loss recognition test performed results in a premium deficiency. Show all work.

(iii) List and order the adjustments needed to eliminate the premium deficiency if a loss recognition test results in a premium deficiency.

(c) (*3 points*) During 2011, a change in tax reserve method was made for this block of business, and you are given the following tax reserve information (amounts in thousands):

	Reserve Method	
Date	Old	New
1/1/2011	10,000	9,700
12/31/2011	10,600	10,185

Calculate the following:

(i) Change in tax reserve amount that will be amortized over 10 years beginning in 2012.

(ii) Amount of tax reserve deduction in 2011.

(iii) Opening tax reserve balance at January 1, 2012.

Show all work.

12. (*14 points*) You are the actuary in charge of U.S. GAAP valuation for a U.S. life insurance company. You have been asked to use fair value accounting to calculate the value of options embedded in your company's in-force block of variable annuity contracts as required under SFAS 133.

(a) (*1 point*) State the objective of fair value accounting.

(b) (*2 points*) Summarize the fair value hierarchy of valuation inputs.

(c) (*5 points*)

(i) Define the three approaches to valuation that may be used to determine fair value.

(ii) Evaluate which of these approaches would be most suitable for valuing the embedded option.

(d) (*3 points*) Assess where in the fair value hierarchy the measurement of embedded options is likely to fall.

(e) (*3 points*) The Chief Actuary states that there is no active market for insurance options and suggests that you are free to choose a valuation model and save time by populating it with the same actuarial assumptions you are currently using in your traditional GAAP valuations.

Critique the Chief Actuary's suggestion regarding the use of traditional GAAP assumptions in a fair value valuation exercise.

13. (*5 points*) Maggie is an actuarial student for a U.S. life insurance company responsible for testing her company's new C3P3 implementation.

(a) (*2 points*) Maggie ran 20 scenarios as a test. She ranked the Greatest Present Value of Accumulated Deficiencies (GPVAD) and re-numbered the scenarios for simplicity.

Calculate C3P3 capital requirement at CTE(90), based on the information given below assuming Stochastic Amount is the only non-zero Total Asset Requirement component.

Scenario	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8 - 20**
GPVAD	550	350	250	200	150	100	50	0

Statutory Reserve = 2,500
GAAP Reserve = 1,700
Starting Asset = 2,550

(b) (*1 point*) For her production model environment, Maggie proposed running 500 scenarios generated with an Economic Scenario Generator (ESG) she built. Maggie's manager said that she needed to run at least 1,000 scenarios according to the NAIC, and she should also be using the ESG published by the American Academy of Actuaries.

Critique the accuracy of the manager's statements.

(c) (2 points) You have recently read that European insurance companies typically run 10,000 scenarios and set capital at 99.5% VaR. For U.S. Principle-Based Approach, the standard practice is to use CTE(90) based on 1,000 scenarios.

Explain why European insurance companies may set capital at a higher target security level and run more scenarios than in the U.S. Principle-Based Approach.

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

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