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

Exam CSP-IC

MORNING SESSION

Date: Friday, May 1, 2009
Time: 8:30 a.m. – 11:45 a.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 120 points. It consists of a morning session (worth 60 points) and an afternoon session (worth 60 points).
 - a) The morning session consists of 9 questions numbered 1 through 9.
 - b) The afternoon session consists of 8 questions numbered 10 through 17.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-IC.
6. Be sure your essay answer envelope is signed because if it is not, your examination will not be graded.

Tournez le cahier d'examen pour la version française.

****BEGINNING OF EXAMINATION****
MORNING SESSION

- 1.** (4 points) You have been asked by management to assess the effectiveness of your company in satisfying Section 404 of Sarbanes Oxley Act (SOX).
- (a) (1 point) Explain management's responsibility as it pertains to SOX.
 - (b) (3 points) Evaluate the appropriateness of each statement under SOX, as it applies to current control processes:
 - (i) Impacts of a change in product mix are ignored when responding to examiners in connection with financial statements.
 - (ii) The actuary's communication considers their perception of the significance of the actuarial findings and relevant communication guidance in other Actuarial Standards of Practice.
 - (iii) The actuary discloses the source of data.
 - (iv) Claims lag analysis is based on automated claims.
 - (v) Peer reviews are not required.
 - (vi) Internal auditors are used to review and sign off on the self-assessment process.

2. (10 points) XYZ Life, a U.S. insurance company, is considering the purchase of ABC Life as a wholly owned subsidiary. XYZ Life is also considering acquiring two blocks of business. The corporate tax rate is 35%.
- (a) (2 points) Explain reasons and prerequisites for an acquisition from the buyer's point of view.
- (b) (4 points) ABC Life followed a policy of full distribution of statutory earnings to owners. There are no deferrable expenses. The hurdle rate is 9%.

At December 31, 2008, ABC Life projected the following:

	2009	2010	2011
Premiums	977	1,123	1,291
Investment Income	391	449	516
Death Benefits	122	140	161
Expenses	273	314	361
Commissions	195	224	258
Change in Statutory Reserves	384	618	852
Change in GAAP Reserves	326	525	724
Change in Tax Reserves	345	556	766
Increase in Required Capital	135	124	72

Calculate the present value of Distributable Earnings at January 1, 2009 based on the data provided. Show all work.

- (c) (4 points) You are given the following information for the two blocks of business as of the acquisition date:

	Block 1	Block 2
Assets to be transferred	170	325
Solvency Reserves to be transferred	200	350
Tax Reserves	185	335
Required Capital for XYZ	25	50
Pre-tax Transaction Costs	5	10
DAC balance after purchase	45	90
Life Insurance Intangibles	0	0

Evaluate each block of business based on recoverability of DAC, and recommend which block(s) to acquire. Show all work.

- 3.** (6 points) ABC life insurance company management is reviewing the five year financial plan by individual product line.

You are given:

Product Line	5 Year After-Tax ROE	Equity at Jan. 1, 2009	Equity at Dec. 31, 2013	Compound Annual Equity Growth Rate
A	20.0%	50	64	5.0%
B	13.0%	100	161	10.0%
C	6.5%	200	420	16.0%
D	16.0%	125	311	20.0%
Total Company	11.3%	475	956	15.0%

Assume:

- Cost of capital is 15%.

Company Objectives:

- Introduce an annual shareholder dividend of 3% of equity.
- Continue to offer all product lines.

- (a) (2 points) Assess problems with this financial plan.
- (b) (4 points) Recommend changes to the financial plan to support an annual shareholder dividend of 3% of equity. Show all work.

4. (9 points) You are given the following information about the company's assets and liabilities:

Liability	Par Value	Contractual Return	Required Yield
1 year GICs	3,000	5%	6%
Debt	1,000	5%	12%

- Portfolio of risky assets (market value): 5,000
- Risk free rate: 5%
- The price of insurance to permit the portfolio to be financed risk-free for a year is 400.

- (a) (1 point) Define:
- Risk capital;
 - Regulatory capital.
- (b) (4 points) Construct the:
- Accounting balance sheet;
 - Risk capital balance sheet.
- (c) (2 points) Reinsurance is available to cover a portion of any losses incurred on the investment portfolio at a cost of 200.

Determine the impact of reinsurance on the:

- Accounting balance sheet;
 - Risk capital balance sheet.
- (d) (2 points) Assess the following statement:
- “The reinsurance industry has been enjoying record growth so they must have the expertise to manage risk.”

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The following information applies to Questions 5 and 6

5-6.

You are given the following balance sheet information for MKH Life Insurance at December 31, 2007 (in millions):

Assets	
Corporate Bonds	1,200
Commercial Mortgages	600
Common Stocks	700
Total	2,500

Liabilities	
Variable Annuities with minimum death benefit guarantees	100
Term life insurance	800
Fixed deferred annuities with market value adjustments	600
Total	1,500

Surplus	
Retained Earnings	800
Debt capital	200
Total	1,000

As of December 31, 2007:

- Account value of variable annuities is 1 billion
- MKH's RBC ratio is 450%
- Target RBC ratio for a AA rating is 375%
- Asset and liability durations are well matched

During 2008, the following unusual events occurred:

- Equity markets declined 40%
- Market values of the common stocks owned by MKH declined 50%
- Bond qualities declined dramatically in MKH's portfolio
- Defaults on MKH's commercial mortgage holdings increased
- Assets were not trading as usual in the market
- Liquidity premiums increased dramatically
- MKH's 2008 RBC ratio declined to 325%

Current economic forecasts indicate equity markets will continue to decline, and default rates on bonds and mortgages will remain above normal.

5. (8 points)

- (a) (6 points) Explain the impact of 2008's unusual events on each component of MKH's RBC.
- (b) (2 points) Recommend actions that MKH could take to maintain their AA rating.

6. (6 points)

- (a) Analyze the liquidity risks being faced by MKH.
- (b) MKH did not have robust catastrophic risk management processes in place.
 - (i) Explain steps MKH should take to better manage the impact of any catastrophic risks in the future.
 - (ii) Recommend steps MKH could take to prepare for a liquidity risk event.

7. (9 points) You are conducting free cash flow testing on a block of term policies.

(a) (3 points) Compare static and dynamic validations of a cash flow model.

(b) (6 points) You are given:

	Year 1	Year 2
Premiums	25,000	24,000
Expenses	60,000	6,000
Claims	6,000	8,000
Taxes	-10,000	5,000
Increase in end of year required assets	15,000	5,000

Assume:

- Premiums and expenses occur at the beginning of the year
- Claims occur mid year
- Taxes are paid at the end of the year
- Required assets are invested in five year bonds, with 6% semi-annual coupons

(i) Complete the following table:

	Months 1 to 6	Months 7 – 12	Months 13 – 18	Months 19 – 24
Interest received on positive cumulative cash flows			619	
Interest paid on negative cumulative cash flows	1,373			

(ii) Determine the free cash flow for each year.

Show all work.

8. (4 points) You are given the following information for a two year insurance product sold on January 1, 2009:

	Jan. 1, 2009	Dec. 31, 2009	Dec. 31, 2010
Premiums	60.00	40.00	0.00
Investment Return (amount)	0.00	3.15	4.67
Claims	0.00	20.00	70.00
Expenses	10.00	1.00	1.00
Increase (Decrease) in Economic Liabilities	45.06	21.65	(66.71)
Risk Charge	0.00	0.50	0.38
Economic Profit	4.94	0.00	0.00
Risk Capital Cost	10.00	7.60	0.00

Assume:

- Future cash flows and risk capital costs are paid at the end of each year.

Calculate the effect on economic profit at inception of a 1% increase in the risk free interest rate. Show all work.

9. (4 points) BLL Insurance Company sells variable annuities with guaranteed minimum death benefit (GMDB) and guaranteed minimum income benefit (GMIB) options.
- Propose product design features for these two options that could be used to limit the risks to BLL.
 - Identify possible changes in policyholder behavior for these contracts following an increase in market volatility and a decrease in market returns.

****END OF EXAMINATION****
MORNING SESSION