
SOCIETY OF ACTUARIES
Group & Health Specialty Exam

Exam GHSPC

Date: Thursday, May 1, 2014

Time: 2:00 p.m. – 4:15 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 40 points.

This exam consists of 4 questions, numbered 1 through 4.

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 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 Exam GHSPC.
6. Be sure your written-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****

- 1.** (9 points) Backwoods Insurance, Inc. (BII) is currently considering purchasing an existing block of disability income policies.

You are given the paid claims and revenue experience for this block:

	2008	2009	2010	2011	2012
Premiums Received (000s)	\$38.7	\$40.1	\$39.2	\$39.1	\$38.5
Claims Paid (000s)	\$17.8	\$20.2	\$21.3	\$28.4	\$29.9

- (a) (2 points) Describe the types of experience studies that are commonly applied to disability income business and explain their advantages and disadvantages.
- (b) (1 point) Explain the two types of loss ratio studies that can be performed.
- (c) (2 points) Perform a cash-claims ratio study by year based on the data available from BII. Comment on the results in the context of advantages and disadvantages of that type of study. Show your work.
- (d) (1 point) Describe the two key types of disability reserves that could be considered for a disability study.
- (e) (3 points) As you review the block of business that BII is considering purchasing, you discover that there are actually many different rating factors and product types included in this block, and additional analysis of the claims may be necessary. Explain the key parameters that should be analyzed.

2. (12 points) You are a consulting actuary specializing in Enterprise Risk Management (ERM), and you have been retained by Risky Business, a company with a centralized and hierarchical structure. Risky Business has grown at a steady pace in the past few years, but has experienced volatile earnings.

Risky Business has a hurdle rate of 3.0%, and an average risk-adjusted rate of return on capital of 4.5%. The chart below gives their results for the past two years:

	2011	2012
Economic Income Created	\$112.2 M	\$124.7 M
Total Cash Flow	\$400.0 M	\$410.0 M

- (a) (2 points) Explain how ERM reduces the volatility an organization faces.
- (b) (2 points) Describe risk identification techniques and identify those best suited for Risky Business.
- (c) (1 point) Define economic capital.
- (d) (1 point) Explain key considerations for an actuary reviewing an economic capital model.
- (e) (2 points) Define and explain in an ERM framework
- (i) Shareholder Value, and
 - (ii) Shareholder Value Added.
- (f) (4 points) Assume Risky Business will maintain the 2011-2012 observed rate of cash flow growth going forward. Calculate both:
- (i) Shareholder Value, and
 - (ii) Shareholder Value Added.

Show your work.

3. (7 points) You have been asked to complete an actuarial appraisal to determine the value of ABC Insurance company in preparation for sale.

The following financial data from ABC as of December 31, 2012 has been compiled for the actuarial appraisal (all values are in millions):

Adjusted Statutory Book Value	\$100.0	
	In Force Business as of 12/31/2012	Future Business from 12/31/2012
Cost of Capital	\$25.0	\$35.0
Federal Income Taxes	\$65.0	\$105.0
Pre-tax Value of Business before Unallocated Expenses	\$200.0	\$220.0
Unallocated Expenses	N/A	\$10.0

- (a) (2 points) Identify items sellers typically include in their report in addition to the actuarial appraisal, and describe what these additional items provide to the buyer.
- (b) (1 point) You have supplied your actuarial appraisal report to a consulting actuary hired to conduct due diligence on your company. Describe adjustments buyers typically make in developing their edition of the actuarial appraisal report.
- (c) (4 points) Calculate your company's Actuarial Appraisal Value. Show your work.

4. (12 points) You are an actuary working for a clinically-focused insurance company, Hidy-Health. Based on your previous experience, your boss has asked you to help set up a care management program.

You are given the following:

<i>Economic Model for Program</i>	
Eligible Members	100,000
Members with Target Condition	11%-22%
High-Risk Members	20%
Reachable	45%
Admissions/High-Risk Member/Year	1.18
Behavior Change Factor Applied to Admission Reduction	33%
Per Admission Cost	\$11,750

<i>Program Costs</i>	
Fixed Cost	\$2,500,000
Cost per Nurse	\$125,000
Non-nurse Variable Cost (Per Participant Per Month (PPPM))	\$95.00

- (a) (2 points) Identify the steps you would take to execute a care management program.
- (b) (2 points) Describe program metrics that should be explicitly recognized under the Risk Management Economic Model.
- (c) (4 points) Calculate the return on investment (ROI) range, based on the target condition range. Assume there is a nurse staffing ratio of 125 participants per nurse. Show your work.
- (d) (4 points) You are asked to evaluate two potential outsourcing scenarios to improve the ROI:

Scenario 1: A vendor offers a nursing outsourcing program that guarantees an ROI range of 1.09 to 1.57 corresponding to the target range of 11%-22%.

Scenario 2: Outsourcing the call center increases the reachable rate to 60% and the non-nursing variable cost decreases to \$75 PPPM.

Recommend one of the two outsourcing approaches. Justify your answer and show your work.

****END OF EXAMINATION****

USE THIS PAGE FOR YOUR SCRATCH WORK

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