
SOCIETY OF ACTUARIES
Group and Health – Company/Sponsor Perspective

Exam CSP-GH

MORNING SESSION

Date: Friday, November 2, 2012

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 11 questions numbered 1 through 11.
 - b) The afternoon session consists of 11 questions numbered 12 through 22.

The points for each question are indicated at the beginning of the question. Questions 9 - 11 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 CSP-GH.
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.

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. (5 points) You are an actuary at Society Insurance Company (SIC). SIC is working to implement a chronic diabetes disease management (DM) program. SIC's vendor, Occupy Disease Management Programs (ODMP) recently provided the following projections for two DM programs. SIC's Chief Financial Officer (CFO) has asked you and your team to evaluate ODMP's projections.

ODMP has proposed 2 programs. The first program will target diabetic members, and be limited to 1% of the total population. The second program will reach 5% of the total population, which includes the 1% of the population targeted in program 1.

You are given the following:

	DM Program 1	DM Program 2
Number of Health Plan Members	10,000	10,000
Number of Chronic Members	100	500
Annual Cost of DM Program	\$55,000	\$260,000
Annual Gross Savings	\$140,000	\$440,000

- (a) (1 point) Briefly describe:
- (i) Return on Investment (ROI)
 - (ii) Average Savings
 - (iii) Marginal Savings
- (b) (1 point) Explain why average and total savings, as opposed to ROI, are critical measurements in the evaluation of DM programs.
- (c) (3 points)
- (i) Calculate the ROI and per member per month (PMPM) Average Net Savings for the two programs. Show your work.
 - (ii) Calculate the Marginal Net Savings Per Chronic Member Per Month (PCMPM) for the first 100 and next 400 members. Show your work.
 - (iii) Recommend a program. Justify your answer.

2. (3 points)

- (a) (1 point) List what is considered advertising with respect to Accident and Sickness Insurance (other than Medicare Supplement).
- (b) (1 point) Outline the renewal, cancelability and termination provisions that must be included in the advertising.
- (c) (1 point) Outline the requirements for a script if a famous celebrity or sports figure was to endorse an insurance product in an advertisement.

3. (7 points) You are the pricing actuary for Dewey Cheat'em and Howe. You were recently contacted by the Actuarial Board for Counseling and Discipline (ABCD) regarding your state rate filing for a new product. The person at the ABCD informs you that the state actuary has accused you of being unqualified to sign the rate filing for this product. The state actuary has never contacted you regarding this situation.

- (a) (2 points) Describe the steps the ABCD will take.
- (b) (2 points) List and explain the precepts that may have been violated by:
 - (i) You
 - (ii) The state actuary
- (c) (3 points) Describe the Qualifications and Rules you must follow to sign an Actuarial Memorandum per the American Academy of Actuaries (AAA).

4. (5 points) You are an actuary working for Twelve Bones Health Plan (TBHP). Over the past year TBHP has placed an increased focus on quality and efficiency.

(a) (1 point) Describe the limitations and measurement challenges in assessing healthcare quality and efficiency.

In 2011 you implemented a clinical program to help reduce preventable admissions related to Chronic Obstructive Pulmonary Disease (COPD). You have decided to evaluate the program using an open and closed cohort method. The data is provided in the table below:

Time Period	1/1/2010-12/31/2010	Open Cohort Results 1/1/2011-12/31/2011	Closed Cohort Results 1/1/2011-12/31/2011
COPD Member Months	50,000	51,000	49,500
Admissions for COPD Members	4,100	3,800	3,200
Cost/Admission	\$7,500	\$7,875	\$7,875

Total Member Months = 1,200,000
Annual Admission Utilization Trend = 5%

(b) (2 points) Calculate the savings for each cohort. Show your work.

(c) (2 points) Explain possible differences in savings calculated between the open and closed cohorts.

5. (6 points) Blue Line Insurance Company's (BLIC) Chief Actuary takes a "better safe than sorry" approach to reserving and routinely over-estimates Fee For Service (FFS) payment based claims. You are concerned with this approach in regards to its impact on BLIC's risk based capital (RBC) requirements.

You are given:

Underwriting Risk Factors by Underwriting Revenue Tier		
Coverage	\$0-100M	\$100M+
Comprehensive	15%	10%

Coverage	Total Revenue	Total Claims
Comprehensive	\$125.0M	\$120.0M

Managed Care Risk Adjustment Factor			
Category	Description	Factor	Total Claims
0	Fee for Service	1.000	\$100M
3	Capitation	0.400	\$20M

Health RBC Risks	
H0	\$5.0M
H1	\$5.0M
H2	\$15.0M
H3	\$1.0M
H4	\$4.0M
TAC	\$16M

- (a) (1 point) Describe the purpose and calculation of the managed care risk adjustment factor.
- (b) (1 point) Calculate BLIC's Total Adjusted Capital (TAC) to Authorized Control Level (ACL) Ratio. Show your work.
- (c) (3 points) Assume the FFS payment based claims are overstated by 25% and all other non-Underwriting risks and TAC remain the same. Calculate a re-stated value of Underwriting risk, H₂, and resulting TAC to ACL ratio. Show your work.
- (d) (1 point) List references from the Actuarial Standards of Practice #5 (ASOP #5), Incurred Health and Disability Estimates that could persuade the Chief Actuary to change his/her reserve approach.

6. (5 points) You are an actuary for the Vanderbilt Insurance Company (VIC). You have been asked to look into reinsuring VIC's group long-term disability (LTD) business.

You are given the following about the LTD business:

Monthly Salaries

Member #1	\$6,000
Member #2	\$3,000
Member #3	\$8,000
Member #4	\$10,000

Expected probability of claim per member per month = 1%
LTD coverage is 100% replacement of employee's salary

You are considering two reinsurance options:

- (1) Automatic Excess Coverage
Excess of \$5,000/month
- (2) Facultative Quota Share = 90%

Assume the following:

Reinsurer expenses	20% of reinsurance premiums
Reinsurer profit/risk load	10% of reinsurance premiums

- (a) (1 point) Explain automatic excess coverage and facultative quota share reinsurance from the perspective of the ceding company and the reinsurer.
- (b) (1 point) Describe considerations in pricing for each type of reinsurance option.
- (c) (2 points) Calculate the reinsurance premium for each option.
- (d) (1 point) Calculate the reinsurer's annual profit/loss under both options if only member #1 has a claim. Assume the claim lasts for 6 months.

7. (4 points) Piggy Heist Inc. (PHI) offers a defined benefit retirement plan to its employees. PHI is preparing its 2011 financial statements and has asked you to review the plan liability for one of its employees.

Benefit: Annual payment equal to 1% of employee's salary in the year prior to retirement times the number of years of service. Employees are eligible to retire at age 57.

Current Fund Balances Attributable to the Employee	
Unrecognized Gain	\$1,250
Unrecognized Past Service Cost	\$3,000
Fair Value of Plan Assets	\$25,000

Market Yields on Available Investments	
Government Bonds	1.50%
High Quality Corporate Bonds	2.25%
Mutual Funds	3.00%

Employee's Current Annual Salary	\$105,000
Employee's Current Age	53
Years of Service	12
Years until Retirement	8
Expected Annual Increase in Salary	3%

- (a) (2 points) Calculate the present value of the actuarial liability using the required attribution method under FAS 106, assuming there will be no decrements. Show your work.
- (b) (2 points) Calculate the amount PHI should recognize on its balance sheet to recognize the pension for the employee based on IAS 19 standards. Assume PHI will immediately recognize any gains or losses. Show your work.

- 8.** (7 points) You are the valuation actuary supporting a new individual disability level premium product. The product will be sold to individuals and expires after 5 years inforce.

You are given the following projected information.
Assume the interest rate = 0%.

	Premium	Paid Claims	Expenses	Commissions
Year 1	\$100.00	\$15.39	\$15.00	\$40.00
Year 2	\$90.00	\$29.23	\$13.50	\$0.00
Year 3	\$80.00	\$41.54	\$12.00	\$0.00
Year 4	\$70.00	\$52.31	\$10.50	\$0.00
Year 5	\$60.00	\$61.53	\$9.00	\$0.00

- (a) (1 point) Prepare a cash-basis income statement for each year. Show your work.
- (b) (1 point) Explain how Active Live Reserves (ALR) are calculated and how they spread benefit costs over the policy life.
- (c) (2 points) Calculate the ALR at the end of each year. Show your work.
- (d) (1 point) Explain how the Deferred Acquisition Cost (DAC) is calculated and how it spreads expenses over the policy life.
- (e) (1 point) Calculate the DAC balance at the end of each year. Show your work.
- (f) (1 point) Prepare a finalized income statement with both ALR and DAC effect for year 1

Questions 9 – 11 pertain to the Case Study.
Each question should be answered independently.

- 9.** (6 points) You are reviewing Kate Nickleby’s year-end reserve analysis for Barnaby Rudge. Through your review and recent discussions with the claims staff, you have become concerned about the impact of conversions to International Classification of Diseases 10th Revision (ICD-10) on claims payment patterns.
- (a) (1 point) From a health plan’s perspective,
- (i) Explain what ICD-10 is.
 - (ii) Describe why the conversion will be a challenge to implement.
 - (iii) Identify the core business operations that will be impacted by this conversion.
- (b) (1 point)
- (i) Explain how the ICD-10 conversion will impact the reserving process.
 - (ii) Identify metrics you should review to determine the impact on the reserving process.
 - (iii) Identify actions you will need to take based on the results of (ii).
- (c) (2 points) Calculate the Incurred But Not Paid (IBNP) reserve for November and December incurral dates assuming no change in claim payment patterns. Show your work.

You believe that implementation of ICD-10 has slowed the submission of claims by providers. You believe this only impacts claims incurred during the last two months and that the data is impacted as follows:

- 10% of incurred claims for November that normally would have been submitted and paid by 12/31 will be submitted in the following year.
 - 50% of incurred claims for December that normally would have been submitted and paid by 12/31 will be submitted in the following year.
- (d) (2 points) Calculate the IBNP reserve for November and December incurral dates reflecting the above adjustments. Show your work.

*Questions 9 – 11 pertain to the Case Study.
Each question should be answered independently.*

- 10.** (6 points) You are a consulting actuary for Copperfield. In addition to the Copperfield's 2011 GAAP Annual Report, you have gathered the following data:

	31-Dec-11
NAIC prescribed asset value for fixed maturity securities (both current and long-term)	\$1,580
Total agents' balances (amounts which are owed Copperfield by agents)	\$52
Statutory actuarial and policy liabilities	\$8,464
Asset Valuation reserve	\$15
Interest Maintenance Reserve	\$23

(amounts are in millions)

- (a) (2 points) Contrast US statutory financial reporting with US GAAP financial reporting.
- (b) (2 points) Calculate the total assets and total liabilities on a statutory basis as of December 31, 2011, assuming that all the needed adjustments are captured in the table above. Show all work.
- (c) (2 points) Describe and explain the components of an actuarial appraisal.

**Questions 9 – 11 pertain to the Case Study.
Each question should be answered independently.**

11. (6 points)

- (a) (2 points) Define and distinguish between Net Cash Flow, Cash Flow from Operating Activities, Free Cash Flow and Discounted Cash Flow.
- (b) (2 points) Evaluate the Net Cash Flow and Cash Flow from Operating Activities for Copperfield and Great Expectations for 2012. Show your work.
- (c) (1 point) Evaluate the Current Test for Copperfield and Great Expectations for 2012. Show your work.
- (d) (1 point) According to the Actuarial Standard of Practice #7 (ASOP 7), identify situations which may indicate the need for cash flow testing.

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

USE THIS PAGE FOR YOUR SCRATCH WORK

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