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**SOCIETY OF ACTUARIES**  
**Group and Health – Company/Sponsor Perspective**

**Exam CSP-GH**

**MORNING SESSION**

**Date:** Friday, May 3, 2013  
**Time:** 8:30 a.m. – 11:45 a.m.

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**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 12 questions numbered 1 through 12.
  - b) The afternoon session consists of 10 questions numbered 13 through 22.

The points for each question are indicated at the beginning of the question. Questions 10 - 12 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. (3 points) Describe the following methods for determining claim reserves and when that method would be appropriate to use:
- (a) (1 point) Case Reserves
  - (b) (1 point) Projection Method
  - (c) (1 point) Development Method

2. (7 points) You are the pricing actuary for Go Big Red (GBR) Insurance Company, and you have been asked to assist with the analysis and pricing of an employer group life plan.

- (a) (1 point) List the factors to consider when determining the total cost of an insured risk.
- (b) (1 point) List the alternative funding arrangements employers may consider to reduce total plan costs.

You are given the following:

Five year actual paid claims (annual average)	\$1,850,000
Expected annual paid claims (based on pricing manual)	\$1,500,000
Credibility Factor	65%
Underwriting Margin	10% of Incurred Claims
Reserve Adjustment	\$25,000
Pooling Charge	\$45,000
Administrative Costs	15% of required premium

- (c) (3 points) Calculate the required premium for the group. Show your work.
- (d) (2 points) Describe the possible strategies to reduce your quote if the premium calculated in part (c) is determined to be uncompetitive.

**3.** (5 points)

- (a) (2 points) Describe how changes in an insurance carrier's mix of business by segment impacts the amount of the following types of reserves:
- (i) Premium Deficiency Reserves (PDR)
  - (ii) Active Life Reserves (ALR)
- (b) (3 points)
- (i) List types of non-claims reserves other than PDR and ALR.
  - (ii) Explain when each type of reserve is required.
  - (iii) Briefly explain how each type of reserve is calculated.

**4.** (4 points) You are an actuary for the Flirtatious Compound Insurance Company (FCIC). The company is growing fast, and you are asked for your thoughts on sustainable growth.

- (a) (2 points) Describe approaches to manage the situation when actual growth exceeds sustainable growth.
- (b) (1 point) Describe approaches to manage the situation when actual growth is below sustainable growth.

FCIC has the following projection for 2013

- Beginning of year equity = \$500 million
  - Earnings = \$150 million
  - Expected growth rate in sales = 20%
- (c) (1 point) Calculate the maximum dividend rate that can be paid out in order to maintain a sustainable growth rate. Show your work.

- 5.** (4 points) You work for a Managed Care Organization (MCO).
- (a) (3 points) Describe the group market in relation to:
- (i) Buyers
  - (ii) Rating characteristics
  - (iii) Sales process
- (b) (1 point) Describe benefit design considerations required by the Affordable Care Act (ACA) for 2014 small group products.

6. (3 points) You are a retiree benefits consultant for YaKnow Company (YKC). You have been given the following:

Years	PV Factor	Years	PV Factor	Years	PV Factor	Years	PV Factor
1	0.952	11	0.585	21	0.359	31	0.220
2	0.907	12	0.557	22	0.342	32	0.210
3	0.864	13	0.530	23	0.326	33	0.200
4	0.823	14	0.505	24	0.310	34	0.190
5	0.784	15	0.481	25	0.295	35	0.181
6	0.746	16	0.458	26	0.281	36	0.173
7	0.711	17	0.436	27	0.268	37	0.164
8	0.677	18	0.416	28	0.255	38	0.157
9	0.645	19	0.396	29	0.243	39	0.149
10	0.614	20	0.377	30	0.231	40	0.142

	Employee 1	Employee 2	Employee 3
Age at hire	25	30	40
Attained Age	45	40	50
Assumed Retirement Age	60	55	65
Future value of retirement benefits	\$50,000	\$75,000	\$125,000

- (a) (1 point) Describe the components of the Net Periodic Postretirement Benefit Cost (NPPBC).
- (b) (2 points) Calculate the Expected Postretirement Benefit Obligation (EPBO), Accumulated Postretirement Benefit Obligation (APBO) and Service Cost (SC).



7. (6 points) With respect to Medicare Prescription Drug Plan (PDP) bids:
- (a) (1 point) Describe the difference between the following:
    - (i) A standard plan design with actuarial equivalent cost sharing
    - (ii) A basic alternative plan design
    - (iii) An enhanced alternative plan design
  - (b) (2 points) Explain the testing of actuarial equivalent cost sharing.
  - (c) (2 points) Explain the testing of alternative coverages.
  - (d) (1 point) List the qualifications an actuary needs to render a certification of actuarial equivalence for Part D bids.

8. (5 points) XYZ Company sponsors an unfunded subsidized retiree medical plan. You are the actuary and consultant for the plan sponsor and perform annual valuations of the plan as required.

You are given the following:

Plan financials prior to the plan change:		Key assumptions:	
Accumulated benefit obligation	\$34,260,000	Inflation assumption	2.5%
Beginning of year service cost	\$300,000	Discount rate	5.0%
Expected benefit disbursements	\$2,340,000	Initial medical trend	8.0%
Unrecognized prior service cost	\$0	Ultimate medical trend	4.5%
Unrecognized losses	\$5,400,000	Years to ultimate	7

Other information:

Current average period to full eligibility age:	8.0 years
Current average period to expected retirement age	12.0 years

XYZ Company is amending the plan as follows:

- Increase the accumulated benefit obligation by \$2,000,000
- Increase the service cost by \$50,000
- The amendment vests immediately

Assume the following:

- Average future service to full eligibility of the affected group is 10.0 years
- Assume no other changes.

- (a) Calculate the net periodic benefit cost for XYZ Company after the above change under U.S. GAAP. Show your work.
- (b) Calculate the net periodic benefit cost for XYZ Company after the above change under IAS 19. Show your work.

- 9.** (4 points) You are an actuary for Mange Health Insurance (MHI) tasked with evaluating the effect of the Affordable Care Act (ACA) on your company's individual health insurance market enrollment and morbidity. You are considering hiring a consultant to help you. Two consulting firms have offered their services to you.

Consulting firm A is mainly staffed by public health experts and economists who plan to serve you by reviewing and summarizing national literature on the topic of ACA that has already been published. They plan to adjust overall findings based on your unique circumstances.

Consulting firm B is mainly staffed by actuaries and would plan to model the specific ACA provisions in the states in which your employer operates, reflecting your employer's enrollment and claims as the starting point.

Compare and contrast how data quality concerns between the two different proposals should be considered in meeting your actuarial standards of practice requirements.

*Question 10 pertains to the Case Study.  
Each question should be answered independently.*

**10.** (11 points) Instead of merging with Great Expectations, Copperfield is now considering the acquisition of another company. Copperfield's Chief Executive Officer (CEO) is interested in the two following companies that were recently identified in Prince Investment Advisors (PIA) newsletter:

- Catcher in the Rye Company (CITR)
- 100 Years of Solitude Company (100YOS)

You contacted PIA and obtained the following information in addition to the financial data provided in their newsletter:

- The information provided by PIA is as of December 31, 2011
  - The actuarial appraisal values of CITR and 100YOS are equal to their market capitalization
  - The value of inforce business is estimated at 2 times the net income of 2011 for CITR and 7 times the net income of 2011 for 100YOS
  - The risk free rate is 3.00% and the expected rate of return for the market as a whole is 5.00%
- (a) (1 point) List the financing sources available to Copperfield to obtain the capital needed to purchase one of those companies.
- (b) (3 points) Determine the value of future business capacity of CITR and 100YOS as of December 31, 2011 using the target price. Show your work.
- (c) (1 point) List reasons why your actuarial appraisal value might differ from the point-of-view of another purchaser.

## 10. Continued

- (d) (2 points) Describe the Capital Asset Pricing Model (CAPM) and calculate the expected rate of return on the acquisition of CTR and 100YOS. Show your work.
- (e) (2 points) Describe the approaches, other than CAPM, that are available to determine the discount rate used in your actuarial appraisal.
- (f) (2 points) Recommend whether CTR or 100YOS should be acquired, and if so, which one. Justify your recommendation.

*Question 11 pertains to the Case Study.  
Each question should be answered independently.*

**11.** (4 points) Your manager recently asked you to assist in forecasting and analyzing the financial performance of your company, Leaves of Grass Company (LOG), as well as another company, Crime and Punishment (C&P).

- (a) (2 points) Calculate the Return on Equity (ROE), Return on Assets (ROA), and Return on Invested Capital (ROIC) for LOG and for C&P in 2011. Show your work.
- (b) (1 point)
  - (i) Describe the components of ROE.
  - (ii) List the limitations in using ROE as a measure of financial performance.
  - (iii) Determine which company appears to be in a better position, based on your answer to part (a). Explain your answer.
- (c) (1 point) Describe techniques for dealing with uncertainty in forecasts.

*Question 12 pertains to the Case Study.  
Each question should be answered independently.*

**12.** (4 points) You work for Great Expectations. Your boss just got back from an industry meeting where she learned about alternative risk transfer (ART).

(a) (2 points) Describe the advantages and disadvantages of ART.

Your boss has asked you to evaluate if an ART strategy that would reduce risk levels by half should be pursued.

You are given the following:

	Economic Capital
Credit Risk	\$30 million
Market Risk	\$40 million
Operational Risk	\$50 million

- Diversification benefit is \$20 million.
- The expected return on debt is 5%.
- The expected return on equity is 10%.
- The risk transfer cost associated with the ART strategy is \$5 million.

(b) (2 points)

- (i) Calculate the cost of capital using Great Expectations 2011 financial data.
- (ii) Analyze the ART strategy and explain what you would recommend to your boss.

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

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