SOCIETY OF ACTUARIES
Financial and Regulatory Environment – U.S.

Exam GIFREU

AFTERNOON SESSION

Date: Thursday, April 27, 2017
Time: 1:30 p.m. – 3:45 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This afternoon session consists of 9 questions numbered 13 through 21 for a total of 40 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 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 morning or afternoon session for Exam GIFREU.

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

475 N. Martingale Road
Schaumburg, IL 60173-2226

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****BEGINNING OF EXAMINATION****
Afternoon Session
Beginning with Question 13

13. (*3 points*)

(a) (*2 points*) Describe two ways that the U.S. statutory accounting treatment by the ceding company of retroactive reinsurance differs from that of prospective reinsurance.

(b) (*1 point*) Explain how a reinsurance contract is to be recorded under U.S. statutory accounting by the ceding company when it contains both prospective and retroactive provisions.

14. (*6 points*) You are a consulting actuary who has been asked by a Caribbean insurance company client to research operating a subsidiary in the U.S. insurance market. Your client is seeking to learn more about the NAIC model laws before creating such a subsidiary.

(a) (*2.5 points*) Describe the following with respect to NAIC model laws:

(i) The NAIC process used to create them; and

(ii) A benefit to your client from the existence of them.

(b) (*2 points*) Describe the four major steps involved in the NAIC accreditation process for a state department of insurance (DOI).

(c) (*1.5 points*) Explain the benefits and criticisms of NAIC accreditation.

15. (*3 points*) Big Lee Insurance (BLI) has the option of continuing catastrophe reinsurance coverage for its Midwest market or, as an alternative, selling catastrophe bonds to offset losses from catastrophes. BLI receives financial ratings from A.M. Best.

(a) (*1 point*) Explain what additional cost for rating agency services would be incurred by BLI if it elects to issue catastrophe bonds.

Rating agencies address a number of operating issues in interactive meetings with insurers. One of these issues is reinsurance.

(b) (*1 point*) Describe two considerations to be addressed in interactive meetings with respect to reinsurance.

Rating agencies make use of (i) capital adequacy models for financial ratings whereas insurers may use (ii) a discounted cash flow model for pricing. Both models require a discount rate to determine the present value.

(c) (*1 point*) Compare (i) to (ii) with respect to the discount rate used to determine the present value.

16. (*6 points*) You are the appointed actuary for a general insurance company and have completed a review of asbestos reserves. Your review used stochastic modeling of your own company's experience as well as industry experience. You selected a continuous range of reasonable estimates from your analysis, which you presented to company management. The asbestos reserves comprise approximately 20% of the company's reserves.

Management has reviewed your analysis and is considering one of three proposals for selecting a best estimate.

Management proposals	
(i)	Exclude the liability estimate for asbestos reserves on the grounds that there is too much uncertainty and it simply cannot be estimated.
(ii)	Select a best estimate below your selected range but within the range of all possible outcomes produced by the model.
(iii)	Select a best estimate at the low end of your range since no amount within the range is a better estimate than any other.

Respond to each of the three management proposals giving consideration to:

- Statements of Statutory Accounting Principles;
- Actuarial Standards of Practice; and
- NAIC Statement of Actuarial Opinion (SAO) Instructions.

17. (*5 points*) Pay-Later Insurance (PLI) writes retrospectively rated policies in which retrospective premium adjustments are made annually. The first retro premium adjustment is based on losses developed through 18 months. Due to time lags in processing and recording, premiums are recorded 9 months following the recording of losses. The following table provides an excerpt of PLI's premium and reported loss development for policy year 2012 from 15 to 39 months of development.

Policy Effective Quarter	PLI Cumulative Booked Premium (amounts in millions)								
	15	**18**	**21**	**24**	**27**	**30**	**33**	**36**	**39**
2012.1	63.5	64.7	66.9	65.7	64.3	64.1	64.2	65.4	66.3
2012.2	44.4	45.4	45.7	42.4	42.4	42.1	41.7	42.7	42.9
2012.3	74.2	77.9	75.7	76.4	74.4	75.0	74.6	75.3	76.4
2012.4	81.4	86.9	85.0	84.3	76.7	76.4	76.5	77.6	78.6
Policy Effective Quarter	**PLI Cumulative Reported Losses (amounts in millions)**								
	15	**18**	**21**	**24**	**27**	**30**	**33**	**36**	**39**
2012.1	37.6	42.4	44.1	44.0	44.5	45.2	46.5	46.7	46.8
2012.2	22.7	23.7	24.6	25.5	25.7	26.0	26.5	26.4	26.5
2012.3	42.4	43.4	43.7	45.1	45.3	45.9	46.4	47.0	47.0
2012.4	37.8	42.6	46.1	46.0	45.7	46.6	46.9	47.9	47.9

(a) (*1.5 points*) Demonstrate that PLI's premium development to loss development (PDLD) ratio for the second retrospective adjustment is 0.55.

The following table provides PLI's parameter estimates for its retrospectively rated policies. The selected PDLD ratios are:

Retrospective Adjustment	1st	2nd	3rd	4th	5th	6th
Selected PDLD ratio	1.70	0.55	0.45	0.40	0.35	0.00
% of loss emerged	72.0%	10%	8.0%	6.0%	3.0%	1.0%

The following provides amounts as of December 31, 2015 for the policy period subject to the second retrospective adjustment:

Expected future loss emergence	70 million
Premium booked from prior adjustment	285 million
Premium booked as of December 31, 2015	275 million

(b) (*2 points*) Calculate PLI's premium asset for the policy period subject to the second retrospective adjustment as of December 31, 2015.

(c) (*1.5 points*) Explain why Schedule P Part 7A (Primary Loss Sensitive Contracts) is not generally used to select a company's experience-based PDLD ratios.

18. (*5 points*) Unusual Liability Providers (ULP), a general insurance company in the U.S., has received notice of an incident involving a construction company that it insures. A crane fell, causing damage to water and sewage lines, thereby contaminating the drinking water for an entire town. A local attorney intends to create a class action suit on behalf of the townspeople.

The construction company has engaged a local biologist as an expert witness. The proposed expert witness has advertised in several newspapers about his new method for determining acceptable contamination levels based on interviews with the plaintiffs. ULP is concerned that if the construction company they insure is found liable, the claim will significantly weaken its financial position.

(a) (*2 points*) Assess the likelihood of *res ipsa loquitor* being applied in this case.

(b) (*0.5 points*) Describe the consequence of *res ipsa loquitor* being applied.

(c) (*1 point*) State two of the four prerequisites for a class action under Federal Rules of Civil Procedure (FRCP) Rule 23(a).

(d) (*1.5 points*) Evaluate the admissibility of the proposed expert witness using the criteria outlined in *Daubert v. Merrell Dow Pharmaceuticals*.

19. (*5 points*) U.S.-based DCB Insurance Group has three general insurance companies: Dom General Insurance (DGI), Chavez General Insurance (CGI) and Biery General Insurance (BGI). DGI is the lead insurer; CGI and BGI are the affiliates. The group's direct written premiums for 2016 were as follows:

Company	Direct Written Premium
DGI	30 million
CGI	80 million
BGI	90 million

The general insurance companies in the group participate in intercompany pooling. DGI, as the lead of the pool, assumes all of the business from affiliates CGI and BGI. Pooling participation for the affiliates is as follows: 25% for CGI and 20% for BGI.

The companies of DCB Insurance Group have reinsurance with external reinsurers as follows:

- CGI cedes 10% of its business in a quota share agreement before intercompany pooling.
- The pool cedes 35% of its business in a quota share agreement.

The pooling and external reinsurance have not changed over the past several years. Unearned premiums for each DCB Insurance Group general insurance company has remained unchanged over 2016.

The 2016 NAIC Annual Statement Underwriting and Investment Exhibit Part 1B, Premiums Written includes reinsurance amounts that are from Schedule F Parts 1 and 3.

(a) (*3 points*) Determine the following amounts for each of DGI, CGI and BGI, to be reported on the 2016 Underwriting and Investment Exhibit Part 1B:

(i) Direct + Assumed written premium

(ii) Ceded written premium

(iii) Net written premium

(b) (*2 points*) Determine the following amounts for each of DGI, CGI and BGI to be reported on the 2016 Schedule P Part 1.

(i) Direct + Assumed earned premium

(ii) Ceded earned premium

(iii) Net earned premium

20. (*4 points*) The NAIC *Own Risk and Solvency Assessment (ORSA) Guidance Manual* states that Section 1 of an ORSA Summary Report should include a description of the insurer's enterprise risk management (ERM) framework. It notes that this description should provide a high-level summary of each of the key principles for an effective ERM framework.

(a) (*1 point*) Identify the key principles for an effective ERM framework.

Section 2 of the NAIC's ORSA Summary Report is the insurer's assessment of its risk exposures.

(b) (*1.5 points*) Explain why the NAIC ORSA guidance manual indicates that each material risk category is to be identified independently in Section 2 of the ORSA Summary Report.

Section 3 of NAIC's ORSA Summary Report is the group assessment of risk capital and prospective solvency assessment.

(c) (*1.5 points*) Explain what the prospective solvency assessment should demonstrate.

21. (*3 points*) Several characteristics of the U.S. regulatory system contributed to the relatively strong performance of insurance companies in the recent financial crisis.

(a) (*1.5 points*) Describe two of these characteristics.

The Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank) of 2010 created the Federal Insurance Office (FIO).

(b) (*1 point*) Describe two administrative functions of the FIO as established in Dodd-Frank.

(c) (*0.5 points*) Identify the Dodd-Frank condition for a state regulator to be solely responsible for regulating the financial solvency of reinsurers domiciled in its state.

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

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