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

# Exam GIFREU

## AFTERNOON SESSION

**Date:** Thursday, October 30, 2014

**Time:** 1:30 p.m. – 3:45 p.m.

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### INSTRUCTIONS TO CANDIDATES

#### General Instructions

1. This afternoon session consists of 9 questions numbered 14 through 22 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.



**\*\*BEGINNING OF EXAMINATION\*\***

**Afternoon Session**  
***Beginning with Question 14***

- 14.** (5 points) You are the consulting actuary for Gemini General Insurance (GGI). GGI's auditor has asked for your opinion on methods to determine if GGI's reinsurance contracts meet the risk transfer requirements to be accounted for as reinsurance. GGI's auditor is aware of three different risk measures (the 10-10 rule, expected reinsurer deficit and a measure based on a multiple of right-tailed deviation) but is unsure as to which is appropriate.

GGI's reinsurance coverage includes a catastrophe excess-of-loss treaty and a quota share treaty with a sliding scale commission. The sliding scale commission feature of the quota share treaty slides the commission from a maximum of 35% at a loss ratio of 50% (or lower) to a minimum of 25% at a loss ratio of 60% (or higher). Neither treaty includes a payment schedule.

- (a) (2.5 points) Explain the appropriateness of each of the three risk measures noted above and select a preferred risk measure for GGI. Justify your selection.
- (b) (1 point) Select the appropriate statutory accounting treatment of GGI's quota share treaty if it had included a loss payment schedule that defers loss recoverable payments for several years. Justify your selection.
- (c) (0.5 points) Explain how quota share treaties, accounted for as reinsurance, provide statutory surplus relief.

In the Notes to Financial Statements, the note on Reinsurance Assumed and Ceded includes information that allows one to determine the amount of surplus relief provided by reinsurance.

- (d) (1 point) Describe the information included in this note that allows one to determine the surplus relief provided by reinsurance.

15. (5 points) You are an actuarial analyst working for a state department of insurance. Your supervisor asks you to research some IRIS ratios for InsureMyStuff Insurance Company (IMSIC), an automobile and property insurer.

You are given the following table compiled from IMSIC's Annual Statement. Amounts in the table are in thousands.

Annual Statement Data	2012	2013
From Page 3, Liabilities, Surplus and Other Funds		
Line 37: Surplus as regards policyholders	33,350	37,550
From Page 4, Statement of Income		
Line 1: Premiums earned	116,100	128,200
Line 2: Losses incurred	75,800	100,000
Line 3: Loss adjustment expenses incurred	15,750	23,550
Line 4: Other underwriting expenses incurred	29,550	20,000
Line 5: Aggregate write-ins for underwriting deductions	350	100
Line 7: Net income of protected cells	0	0
Line 9: Net investment income earned	11,200	8,400
Line 11: Net investment gain (loss)	12,300	26,500
Line 15: Total other income	0	0
Line 17: Dividends to policyholders	400	150
From Page 8, Underwriting and Investment Exhibit, Part 1B, Premiums Written, Line 35 Totals		
Column 1: Premiums Written - Direct Business	224,000	225,000
Column 2 + Column 3: Premiums Written - Reinsurance Assumed	8,200	6,000
Column 4 + Column 5: Premiums Written - Reinsurance Ceded	117,500	108,000

- (a) (2 points) Calculate IMSIC's Two-Year Overall Operating Ratio (IRIS Ratio 5) for 2013.

Other key IRIS ratios for IMSIC are included in the following table:

IRIS Ratio	IMSIC Result for 2013 (%)
Ratio 1 - Gross Premiums Written to Policyholders' Surplus	615
Ratio 2 - Net Premiums Written to Policyholders' Surplus	328
Ratio 11 - One-Year Reserve Development to Policyholders' Surplus	24
Ratio 12 - Two-Year Reserve Development to Policyholders' Surplus	30
Ratio 13 - Estimated Current Reserve Deficiency to Policyholders' Surplus	32

**15. Continued**

- (b) (3 points) Propose a recommendation to your supervisor regarding the results of IMSIC's IRIS ratios as calculated in part (a) and as provided in the table of ratios. Include with your recommendation an assessment of the results, potential reasons for the results and any potential revisions to the ratios.

- 16.** (4 points) Mutual of Keith County (Keith) sold a subsidiary, Hawk Indemnity Insurance Company (Hawk), to the Mutual Group of Seabrook (Seabrook). The closing was as of December 31, 2010. The purchase agreement contained a loss reserve development clause and established an escrow account. Two years after the purchase, the agent for the escrow account is required to pay Seabrook for any adverse loss reserve development on losses up to a maximum of \$1,000,000. Hawk's reserves do not include any discounting.

You are given the following excerpt from Hawk's 2012 Annual Statement, Schedule P – Part 2 – Summary:

Year in Which Losses were Incurred	INCURRED NET LOSSES AND DEFENSE AND COST CONTAINMENT EXPENSES REPORTED AT YEAR END (\$000 OMITTED)									
	1	2	3	4	5	6	7	8	9	10
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1. Prior	1,860	1,734	1,625	1,448	1,398	1,326	1,298	1,285	1,285	1,289
2. 2003	7,211	6,179	6,175	6,199	6,246	6,318	6,355	6,368	6,375	6,377
3. 2004	xxx	5,970	5,965	5,950	5,830	5,850	5,861	5,901	5,913	5,919
4. 2005	xxx	xxx	4,795	4,810	4,800	4,807	4,813	4,822	4,830	4,831
5. 2006	xxx	xxx	xxx	5,085	5,096	5,109	5,129	5,172	5,224	5,225
6. 2007	xxx	xxx	xxx	xxx	6,185	6,196	6,255	6,387	6,400	6,419
7. 2008	xxx	xxx	xxx	xxx	xxx	7,004	7,104	7,120	7,192	7,294
8. 2009	xxx	xxx	xxx	xxx	xxx	xxx	7,237	7,231	7,408	7,562
9. 2010	xxx	xxx	xxx	xxx	xxx	xxx	xxx	8,016	8,537	8,778
10. 2011	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	9,567	9,941
11. 2012	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	8,945

- (a) (1 point) Evaluate how the escrow account should be settled.
- (b) (0.5 points) Describe any issues that might occur in an evaluation of the escrow account if Hawk's reserves included nontabular discounting. If there are no issues, explain why that is so.
- (c) (0.5 points) Describe any issues that might occur in an evaluation of the escrow account if Hawk's reserves included tabular discounting. If there are no issues, explain why that is so.
- (d) (1 point) Describe any issues that might occur in an evaluation of the escrow account if, after Seabrook's purchase of Hawk, Hawk was included in an inter-company pooling arrangement with Seabrook. If there are no issues, explain why that is so.

**16. Continued**

Schedule P of the Annual Statement contains many parts, each with its own purpose.

(e) (1 point) Describe the purpose of the following Schedule P parts:

(i) Schedule P - Part 6

(ii) Schedule P - Part 7

**17.** (5 points) In a negligence lawsuit, it is generally required that the plaintiff prove all the elements of negligence. This requirement is relaxed in situations where the following apply:

I. *Negligence per se*

II. *Res ipsa loquitor*

(a) (1 point) Explain how *negligence per se* modifies the proof of negligence concept.

In 1986, a Court of Appeals case set forth the three elements that a plaintiff must prove to establish a *res ipsa loquitor* situation:

I. The event must be of a kind which ordinarily does not occur in the absence of someone's negligence.

II. It must be caused by an agency or instrumentality within the exclusive control of the defendant.

III. It must not have been due to any voluntary action or contribution on the part of a plaintiff.

In 2003, the Court of Appeals in *States v. Lourdes Hospital* addressed one of these elements.

(b) (0.5 points) Identify which of these three elements was addressed. Include in your response the reason it was addressed.

(c) (0.5 points) Explain the modification to this element in the 2003 Court of Appeals ruling.

You are given the following details of a potential negligence case:

- Shady Shale Corporation (SSC) is an energy company that extracts natural gas from shale rock layers deep within the earth, a process commonly referred to as fracking.
- Fracking involves drilling long distances into and across the earth's surface for the injection of highly pressurized fluids into the shale area.
- Fluids used in fracking contain a number of chemicals including methanol.
- Fracking has been linked to methane gas leaks.
- SSC conducts fracking operations several miles from the town of Clearview.

## 17. Continued

- Drinking water in Clearview is provided by wells.
- After several months of fracking by SSC, Clearview notes that its water supply has increased levels of methane and toxic chemicals that have made the water unsafe for drinking.
- Dozens of people in Clearview have developed illnesses that are alleged to be due to the contamination of the water supply.
- Clearview files suit against SSC alleging that its fracking operations have contaminated its water wells.
- SSC contends that the well contaminants are naturally occurring and not associated with the fracking process.

(d) (3 points) Describe the issues regarding proof of negligence in the case described. Include in your response the potential applicability of:

- (i) *Negligence per se*
- (ii) *Res ipsa loquitur*

**18.** (4 points) The U.S. Supreme Court affirmed the right of states to regulate insurance in the case *Paul v. Virginia* in 1869. The McCarran-Ferguson Act had a similar effect in 1945.

- (a) (1 point) Explain why the McCarran-Ferguson Act was necessary to affirm the right of states to regulate insurance.

One of the goals of underwriting regulation is to prevent unfair discrimination against insureds or insurance applicants.

- (b) (1 point) Describe two ways that regulation can accomplish this.

Rate regulation approaches can vary from prior-approval at one extreme to no-file at the other with different approaches in between.

- (c) (0.5 points) Identify a rate regulation approach between these two extremes.
- (d) (1.5 points) Select one approach to rate regulation and provide an argument in favor of it. Include a rebuttal to at least one common criticism of the approach selected.

**19.** (5 points)

- (a) (1 point) Explain what is required of the appointed actuary regarding the Actuarial Opinion Summary if the five-year historical exhibit reveals one-year loss development in excess of 5% of surplus in at least three of the past five calendar years.

You are a consulting actuary and the appointed actuary for your client, Bulwark Insurance, a personal lines general insurer writing property and automobile insurance. In preparing your Statement of Actuarial Opinion and Actuarial Report, you notice that the data in Schedule P - Part 1 is inconsistent with data in Schedule P - Part 2. You have relied on Schedule P - Part 2 data for your loss reserve analysis. There is no discounting included in any of Bulwark's reserves. The inconsistency is greater than the materiality standard selected by you for your actuarial report but less than the materiality standard selected by the auditor of the Annual Statement.

- (b) (2.5 points) Explain your professional responsibilities regarding the Statement of Actuarial Opinion in this situation giving consideration to any applicable Actuarial Standards of Practice and the American Academy of Actuaries practice note on "Statements of Actuarial Opinion on Property and Casualty Loss Reserves."

The auditor for Bulwark Insurance has requested details on your calculation of the materiality standard. Your calculation includes some confidential information.

- (c) (0.5 points) Explain your responsibilities regarding this request from the auditor.
- (d) (1 point) Explain the reasons why the auditor's materiality standard can be different from the actuary's materiality standard.

- 20.** (4 points) You have recently started working at a company that specializes in private passenger automobile insurance. Your manager expects your company to be subject to a market conduct examination in the near future and has asked you to quickly look at the use of credit in your company's rating and underwriting process to see if there is anything that might invite regulatory scrutiny. He has asked for a response by the end of the next day.

In the limited time that you have been given, you find that your company's standard procedure is to obtain a credit-based insurance score on each adult member of the household of each insurance applicant. The scores are primarily based on each individual's payment history, income, and outstanding debt. They are used for rating purposes and updated every three years. If a score is not available for any adult member of the applicant's household, the application is automatically declined. For purposes of efficient data storage, the scores are coded in the address record of each applicant.

Write a memo to your manager describing any concerns that you have and any additional information about the process that you would need in order to draw more definitive conclusions.

**21.** (4 points) In estimating the premium asset on retrospectively rated policies, there are two methods for calculating the Premium Development to Loss Development (PDL) ratios.

(a) (1 point) Describe the two methods for calculating PDL ratios and identify the preferred method when the retrospective rating parameters change significantly over time.

You are given the following information on an insurer's retrospectively rated policies:

Policy Year	Ultimate Losses	Losses Reported at Prior Retro Adjustment	Premiums Booked from Prior Adjustment	Premium Booked as of 12/31/13	Completed Retro Adjustments as of 12/31/13
2010	105,000	93,000	151,000	152,000	2
2011	103,000	81,000	147,000	149,000	1
2012	126,000	0	0	191,000	0

Retro Adjustment Period	Selected PDL Ratio
First	1.8
Second	0.7
Third	0.4

No losses are reported after the third retro adjustment.

(b) (3 points) Calculate the premium asset on retrospectively rated policies as of December 31, 2013 arising from policy years 2010, 2011 and 2012.

**22.** (4 points)

- (a) (1 point) Determine whether the following conditions are typically sufficient for the insurer to cancel a personal automobile policy that has been in force for more than 60 days.
- (i) The policyholder did not pay the premium.
  - (ii) The policyholder made a misrepresentation in the policy application.
  - (iii) The license of the policyholder's spouse was suspended.
  - (iv) The policyholder relocated to a state in which the insurer is not licensed.

An insurance department is conducting an examination of an insurer and the following situations have been observed:

- Different premium rates are offered to individuals from different regions with otherwise similar risks.
  - The amount of insurance available varies by marital status.
  - It has refused to issue or renew a homeowners policy based on the applicant's mental impairment.
  - It has refused to insure a risk because another insurer has refused to insure that risk.
- (b) (1 point) Determine whether the situations are considered unfair trade practices with respect to underwriting.
- (c) (1 point) Describe two factors that a state insurance department should consider when deciding which major insurers to schedule for a market conduct examination.
- (d) (1 point) Describe the process used by the team of examiners in performing a market conduct examination.

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

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