



Exam GIFREU

MORNING SESSION

Date: Thursday, November 1, 2018

Time: 8:30 a.m. – 11:45 a.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 100 points. It consists of a morning session (worth 60 points) and an afternoon session (worth 40 points).
 - a) The morning session consists of 13 questions numbered 1 through 13.
 - b) The afternoon session consists of 9 questions numbered 14 through 22.

The points for each question are indicated at the beginning of the question. Questions 10 - 13 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 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.

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 investment structure 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) Under Financial Accounting Standard (FAS) 113 for GAAP accounting, a contract must satisfy at least one of two conditions to qualify for the rules of reinsurance accounting.

(a) (1 point) Describe these two conditions.

David L. Ruhm and Paul J. Brehm review one rule and several risk metrics as methods for determining risk transfer in their paper *Risk Transfer Testing of Reinsurance Contracts*.

(b) (2 points) Describe the one rule and two of the risk metrics for determining risk transfer as reviewed by Ruhm and Brehm.

(c) (1 point) Define the basic formula for each of the two risk metrics described in part (b).

(d) (1 point) Select an appropriate method (rule or risk metric) for the risk measurement of general insurance catastrophe reinsurance contracts. Justify your selection.

2. (4 points) You are the appointed actuary for PBM General (PBM), a U.S. multi-line general insurance company that is well-capitalized. PBM had a surge of construction defect claims in 2017. You worked with the claims department to analyze the construction defect claims and determined that the carried reserves are deficient and material, but there is significant uncertainty in your estimate. PBM management suggests that you issue a Qualified Opinion for 2017 due to the uncertainty of the construction defect claims.

(a) (1.5 points) Explain whether or not you should agree to issue a Qualified Opinion.

Your colleague is peer reviewing your Statement of Actuarial Opinion for PBM before issuing. Your colleague advises that your Relevant Comments should include the following comment about risk factors: “A significant change in medical inflation could have a material effect on auto bodily injury loss reserves.”

(b) (1 point) Explain whether or not you should add this comment.

You are given the following information for calculating PBM’s net loss and loss adjustment expense (L&LAE) reserves:

PBM’s financial information as of year-end 2017		
1,000,000	A	Direct L&LAE (full value)
100,000	B	Assumed reserves from pools & associations
10,000	C	Assumed reserves from retroactive reinsurance
50,000	D	Ceded reserves from retroactive reinsurance
60,000	E	Ceded financial reinsurance that does not meet the risk transfer test
30,000	F	Other ceded reserves (not retroactive or financial reinsurance)
5,000	G	Discount for tabular loss reserves
15,000	H	PBM management's estimate of uncollectible reinsurance
20,000	I	Statutory provision for uncollectible reinsurance

Your colleague provides you with the following formula for PBM’s reported L&LAE reserves for page 3 of its 2017 statutory annual statement: $\text{Net L\&LAE} = [A+B+C-G] - [D+E+F-H] = 980,000$.

You inform your colleague that she incorrectly calculated PBM’s net L&LAE reserves.

(c) (1.5 points) Calculate PBM’s correct net L&LAE reserves.

- 3.** (5 points) Insurance market regulation varies by jurisdiction and type of contract but there are common characteristics.
- (a) (1.5 points) Describe three common characteristics of insurance market regulation.
 - (b) (1.5 points) Describe the role that each of the following public institutions play in the regulation of insurers and the insurance market:
 - (i) Congress
 - (ii) State legislatures
 - (iii) Federal and State courts
 - (c) (2 points) Rank, from greatest to least, the influence each of the following actors has in the development of insurance market regulation. Justify your ranking.
 - A. Regulatory agencies (e.g., departments of insurance)
 - B. Regulated industries (e.g., insurers, other insurance industry-related organizations)
 - C. Non-insurance industry interests (e.g., consumer groups)
 - D. Political elites (e.g., legislators, elected officials)

4. (3 points)

- (a) (1.5 points) Compare punitive damage amounts to compensatory awards.
- (b) (1.5 points) Describe the three guideposts for assessing punitive damages as identified by the U.S. Supreme Court in *BMW of North America v. Gore*.

- 5.** (4 points) In the U.S., the *Notes to Financial Statements* within the statutory Annual Statement includes information that can help an actuary interpret the amounts in the exhibits.

Note 24, Retrospectively Rated Contracts & Contracts Subject to Redetermination, requires disclosure of several items regarding retrospectively rated contracts. One of these items is the total net premiums written subject to retrospective rating.

- (a) (0.5 points) Describe how this requirement is generally met by insurers without listing the premium amounts in the disclosure.
- (b) (0.5 points) Identify two disclosures required of insurers in Note 24, other than the net premiums written subject to retrospective rating and its percentage of total net premiums written.

Note 33, Asbestos/Environmental Reserves, requires detailed reporting of asbestos/environmental liabilities on a gross and net of reinsurance basis.

- (c) (1 point) Explain why it is important for the gross reserve amounts to be included in this note from a regulatory perspective.

Asbestos/environmental reserves may be a factor for a U.S. Appointed Actuary to consider regarding the possibility of a Risk of Material Adverse Deviation (RMAD).

- (d) (1 point) Explain what a U.S. Appointed Actuary is required to include in the Statement of Actuarial Opinion (SAO) regarding asbestos/environmental reserves, other than in the RMAD discussion.
- (e) (0.5 points) Describe what a U.S. Appointed Actuary should do for the Opinion if the carried asbestos/environmental reserves are unreasonably low when compared to a material actuarial estimate of these reserves.
- (f) (0.5 points) Describe what a U.S. Appointed Actuary should do for the Opinion if it is determined by the actuary that the asbestos/environmental reserves are likely material but not reasonably estimable.

- 6.** (6 points) In the U.S., mass torts for asbestos and tobacco are among the costliest. The total cost of injury compensation is comparable for these mass torts.
- (a) (2 points) Describe four similarities between the asbestos mass tort and the tobacco mass tort, other than the total cost of injury compensation.
 - (b) (2 points) Explain why the asbestos mass tort has had a greater effect on the U.S. general insurance industry than the tobacco mass tort.

Bankruptcies of defendants generally signal a resolution of mass torts.

- (c) (2 points) Explain why the bankruptcies of asbestos defendants did not resolve the asbestos mass tort.

7. (4 points) The European Court has ruled that insurer use of gender as a factor in determining insurance rates charged to policyholders is not permitted. However, many insurance industry statistics show that young female drivers have significantly lower automobile insurance loss costs than young male drivers.

The company you work for, subject to the ruling of the European Court, has devised a strategy to comply with the legislation but target its marketing efforts to young female drivers.

Company management is considering taking the following actions:

- Cancelling its current automobile insurance business;
- Creating a direct marketing subsidiary to write personal automobile policies;
- Naming the insurance subsidiary *I Drive Like a Princess* (IDLaP); and
- Requiring all IDLaP policyholders to place an *I Drive Like a Princess* bumper sticker on their vehicles (Note: the bumper sticker is to have a design that is likely to be more favored by young females than young males).

Company management believes that this strategy will enable them to sell policies below the fair market rate for all young drivers combined but above a fair market rate for young female drivers while attracting a book of business consisting of mainly young female drivers.

Critique the company's strategy of using the IDLaP subsidiary as a means of dealing with the European Court's ruling on gender discrimination.

8. (4 points)

- (a) (2 points) Describe the level of detail needed for each of the following two U.S. appointed actuary (AA) requirements:
- (i) For the Statement of Actuarial Opinion (SAO), the AA must review the data for reasonableness.
 - (ii) For the Actuarial Report, the AA must reconcile data used to estimate reserves with the data reported in Schedule P.

You are the AA for ORD General (ORD), a U.S. multi-line general insurance company. ORD is well capitalized with statutory policyholders' surplus of 1.15 billion. You are issuing a reasonable actuarial opinion on the net loss and loss adjustment expense reserves of 1.0 billion booked by ORD. In preparation of your opinion and the actuarial report, you made use of the following amounts for your estimate of net loss and loss adjustment expense reserves:

- Sarah Brown, at Trustworthy Consulting, estimates asbestos and environmental liabilities of 100 million. You reviewed her methods for reasonableness. Sarah meets the qualification standards to sign a SAO.
 - Actuaries, that report to you, estimate liabilities of 600 million for commercial lines business. These actuaries all meet the qualification standards to sign a SAO. This estimate excludes amounts for industry pools and asbestos/environmental liabilities.
 - Non-credentialed actuarial analysts, that report to you, estimate liabilities of 200 million for personal lines business. This estimate excludes amounts for industry pools and asbestos/environmental liabilities.
 - A reasonable actuarial opinion by J.T. Green, the appointed actuary for an industry pool. ORD's share of the 250 million of industry pool liabilities was 5 million. J.T. meets the qualification standards to sign a SAO.
- (b) (2 points) Draft your disclosure(s) related to *making use of the work of another* including where the disclosure(s) appear in your AA documents.

- 9.** (3 points) Compare the discounting of loss reserves under U.S. tax accounting to that permitted under U.S. statutory accounting. In your comparison include the following:
- (i) Types of losses that may be discounted
 - (ii) Discount rate selection
 - (iii) Payment pattern selection

*Questions 10 to 13 pertain to the Case Study.
Each question should be answered independently.*

10. (6 points)

- (a) (2 points) Assess R-Dan General Insurance Company's (R-Dan's) recorded loss and loss adjustment expense (L&LAE) reserves against the following two attributes of reserves using your own judgement (not necessarily Sue Calvin's conclusion).
- (i) Unbiasedness
 - (ii) Reasonableness

You are given the following information regarding R-Dan's L&LAE reserves (amounts in millions):

	2016		2017	
	All Lines Combined	Homeowners Only	All Lines Combined	Homeowners Only
Carried	248.9	28.1	289.5	36.2
Actuarial Estimate	282.8	35.1	318.0	51.7

You are given the following from R-Dan's 2017 Insurance Expense Exhibit (IEE):

- The investment gain ratio is 5.4%;
- The mean surplus for the Homeowners line of business using the IEE method of allocation was 58.4 million.

You are interested in determining the effect on calculations in the IEE based on the scenario that the company had booked the actuary's point estimate for 2016 and 2017 instead of the actual carried amount for L&LAE.

- (b) (4 points) Calculate the effect on the following items for R-Dan's 2017 IEE for this scenario:
- (i) Investment gain ratio
 - (ii) Mean surplus for the Homeowners line of business

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- 11.** (6 points) Yan Laurel, a Board member for R-Dan General Insurance Company (R-Dan), has approached you for some help in understanding the company's underwriting performance. Yan has knowledge of financial analysis but is not an expert in insurance financial analysis.

Yan believes that the company's Annual Statement (AS) understates the poor results for 2017 and that rate increases of over 50% may be indicated for the company to return a profit.

In support of this conclusion, Yan provided you with the following analysis:

2017 Item		Amount (000)	Source
A	Paid losses	453,000	AS Page 9
B	Paid underwriting expenses	162,800	AS Page 11
C	Unpaid losses	266,000	AS Page 33
D	Unpaid underwriting expenses	63,300	AS Page 11
E	Total underwriting cost	945,100	A + B + C + D
F	Total underwriting revenue	618,100	AS Page 9
G	Underwriting result	(327,000)	F – E
H	Underwriting ratio	153%	E ÷ F

Write a memo to Yan including the following information:

- (i) A critique of Yan's calculation of the 2017 underwriting result from the table above.
- (ii) Limitations of using 2017 underwriting results to infer indicated rate increases.
- (iii) Your assessment of R-Dan's 2017 reported underwriting results with respect to current performance.
- (iv) Items required to properly estimate rate indications.

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- 12.** (7 points) You are given the following additional information for R-Dan General Insurance Company (R-Dan) with respect to calculation of its 2017 NAIC Risk Based Capital (RBC) using the RBC formula without catastrophe risk charges:

Item	Amount (000)
R ₀ RBC Charge	56
R ₁ RBC Charge	8,822
R ₂ RBC Charge	5,283

Line of Business	RBC Basic Risk Charge (000)		3-year growth rate for gross written premiums
	For Reserves	For Written Premium	
Homeowners/Farmowners	5,054	24,883	25%
Private Passenger Auto Liability	28,175	32,212	5%
Commercial Auto Liability	48	23	10%
Auto Physical Damage	343	0	7%
Special Property	0	74	0%
TOTAL	33,620	57,192	10%

- RBC Basic Risk Charge refers to the RBC Risk Charge by line of business before any adjustments for excess growth or aggregation across lines of business.
 - The total line in the table above is a summation of the RBC Basic Risk Charges.
 - R-Dan has no loss sensitive or claims-made policies.
 - R-Dan's Premium Concentration factor for RBC purposes is 82.0%.
 - R-Dan's Loss Concentration factor for RBC purposes is 95.8%.
- (a) (1.5 points) Demonstrate that the RBC Basic Risk Charge for Reserves provided in the table above is computed correctly for Homeowners/Farmowners given that the company average development for this line of business is 0.966.
- (b) (1.5 points) Calculate R-Dan's RBC credit risk charge.
- (c) (4 points) Calculate R-Dan's RBC Ratio.

*Questions 10 to 13 pertain to the Case Study.
Each question should be answered independently.*

- 13.** (3 points) You are given the following additional non-statutory information for R-Dan General Insurance Company (R-Dan) as of year-end 2017:

Item	Amount (000)
Discounted unpaid net loss and loss adjustment expenses (L&LAE) using a rate based on R-Dan's investment portfolio	269,200
Discounted unpaid net L&LAE using a rate based on the market for risk-free investments	275,000
Estimate of risk margins for insurance risk	8,600
Bad debts	500
Estimate of R-Dan's franchise value for renewals and distribution systems	63,000

- Deferrable underwriting and acquisition expenses are equal to 12% of premium.
 - The market value of invested assets is approximately equal to the statutory value of the invested assets.
- (a) (2 points) Estimate R-Dan's capital under the following financial reporting systems:
- (i) U.S. GAAP
 - (ii) IFRS
 - (iii) Market value
- (b) (1 point) Explain why financial rating agencies in the U.S. do not use statutory surplus, GAAP equity, or market value capital for a financial strength rating.

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

USE THIS PAGE FOR YOUR SCRATCH WORK

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