GI FREU Model Solutions
Fall 2022

1. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

2. The candidate will understand the analysis of a general insurer's financial health through prescribed formulas, ratios and other solvency regulation methods.

Learning Outcomes:

(1c) Describe the elements of the NAIC Annual Statement.

(1e) Understand and apply the concepts of reinsurance accounting.

(2b) Understand and apply the elements of the NAIC RBC formula.

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 4 (Accounting for Reinsurance Contracts)
- Chapter 12 (Solvency Monitoring)

NAIC Annual Statement

Commentary on Question:

This question tested a candidate's understanding of how deposit accounting differs from reinsurance accounting for reinsurance transactions.

Solution:

Compare *deposit accounting* to *reinsurance accounting*, with respect to how it affects the following items:

(i) *Liabilities* in the statutory Annual Statement

(ii) *Assets* in the statutory Annual Statement

(iii) *Surplus as regards policyholders* in the statutory Annual Statement

(iv) NAIC Risk-Based Capital requirement (R_3, R_4 and Total)

1. **Continued**

Commentary on Question:
The model solution is an example of a full credit solution.

(i) Under reinsurance accounting, loss reserves are shown net of reinsurance recoverable. Under deposit accounting, loss reserves are shown gross of reinsurance recoverable.

(ii) Under reinsurance accounting, reinsurance recoverables on paid losses are shown on the asset side of the balance sheet. Under deposit accounting, a deposit is shown on the asset side of the balance sheet.

(iii) Under both accounting methods, total policyholders' surplus is the same.

(iv) Under reinsurance accounting, R_4 capital requirements will be lower as loss reserves benefit from reinsurance recoverables. However, R_3 Credit Risk capital requirements will be higher.

Under deposit accounting, R_4 capital requirements will be higher as loss reserves do not get reduced by the deposit asset. However, R_3 Credit Risk capital requirements will be lower.

Overall, the RBC ratio is expected to be higher under reinsurance accounting as compared to deposit accounting because R_4 is generally much greater than R_3 for most insurers.

2. **Learning Objectives:**

2. The candidate will understand the analysis of a general insurer's financial health through prescribed formulas, ratios and other solvency regulation methods.

Learning Outcomes:

(2b) Understand and apply the elements of the NAIC RBC formula.

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 6 (Schedule F, Statutory Credit for Reinsurance)
- Chapter 12 (Solvency Monitoring)

Commentary on Question:

This question tested a candidate's knowledge of the NAIC RBC calculation

Solution:

(a) Identify the following items that reduce the total reinsurance recoverables used in the credit risk charge calculation:

(i) Two amounts that are included in the total reinsurance recoverables

(ii) Two amounts that are not reinsurance recoverables

Commentary on Question:

There are several amounts that reduce these recoverables that could have been stated for both (i) and (ii). Only two for each of (i) and (ii) were required for full credit. The model solution is an example of a full credit response.

(i) Reinsurance recoverables from involuntary market pools and reinsurance recoverables from U.S. affiliates, non-pool.

(ii) The Schedule F provision and reinsurance payable.

(b) Identify which RBC risk charges are changed by the adjustment for excess growth.

An excess premium growth factor is added to both Reserve Risk and Premium Risk.

(c) Describe how this factor affects the risk charges in the RBC formula.

Commentary on Question:

The model solution is an example of a full credit response.

2. **Continued**

Investments must first be aggregated by issuer "name." Charges for investments in the ten largest issuer names are doubled. The asset concentration charges for each security are then included within their appropriate asset category (R_1/R_2).

(d) The NAIC RBC formula includes a bond size adjustment factor.

Describe how this factor adjusts the RBC calculation.

Commentary on Question:
The model solution is an example of a full credit response.

An average bond size adjustment factor is calculated based on the number of bond issuers in the portfolio. It is applied to the calculated bond charge and increases the charge for portfolios that are not sufficiently diversified.

(e) Describe how the NAIC RBC formula accounts for the risk from investments in directly owned alien insurance subsidiaries.

It is 22.5% of the book value of the affiliate company's stock held by the insurer. This charge is included in R_2.

(f) Describe how the NAIC RBC formula accounts for the risk from investments in domestic insurance affiliates not subject to NAIC RBC.

It is 50% of the company's share of the reported value of the subsidiary. This charge is included in R_0.

(g) Describe how the RBC catastrophe risk charge reflects this credit risk.

There is a 4.8% charge on ceded amounts from the modeled losses.

3. Learning Objectives:

5. The candidate will be able to understand tort law and insurance law with respect to its impact on the general insurance industry.

Learning Outcomes:

(5a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

Sources:

Excerpts from Business Law for Insurance Professionals, Institutes Custom Publishing, Assignment 1 (Contract Law: Insurance Applications)

Commentary on Question:

This question tested a candidate's understanding of representations and warranties with respect to insurance contract law.

Solution:

(a) Explain how representations differ from warranties with respect to insurance contracts.

Warranties are part of the final insurance contract. Representations are merely collateral, or indirect, inducements to the contract.

(b) Describe the three elements that are required for an insurer to establish that a false representation by an insured has taken place.

1. A statement has been made by the insured that is false or misleading.
2. The statement related to a material fact.
3. The insurer relied on the false or misleading statement in issuing the insurance policy.

(c) Explain why insurers may prefer that courts interpret an insured's statements as warranties rather than representations.

Representations must be proven to have been material to make the policy voidable. The law always assumes warranties to be material, and their breach makes the contract voidable.

(d) Explain how courts have lessened the effects of an insured's statement being regarded as a warranty.

3. **Continued**

Commentary on Question:
There are several ways courts have lessened the effects of this. Only one of these was required for full credit. The model solution is an example of a full credit solution.

When possible, courts interpret policies as severable. That is, noncompliance with a warranty concerning one section of a policy will not necessarily void other sections of the policy.

4. Learning Objectives:

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

(4b) Describe and interpret the current state of general insurance regulation in the U.S. and its development.

(4e) Describe the development of general insurance programs controlled by government or collective insurance industry organizations and their mechanisms of operation.

Sources:

Cappelletti, A., "Government Provision of General Insurance," Society of Actuaries Study Note

Insurance Regulation, The Institutes

- Chapter 1 (Introduction to Insurance Regulation)
- Chapter 2 (Development of Insurance Regulation)
- Chapter 3 (Federal and Other Influences on Insurance Regulation)
- Chapter 4 (Roles of State Regulators and the NAIC in Insurance Regulation)
- Chapter 5 (State Department of Insurance Operations)

Commentary on Question:

This question tested a candidate's knowledge of the several factors relating to the purpose of insurance regulation, the government provision of insurance and the operation of residual markets.

Solution:

(a) Describe the three key objectives for the regulation of private insurance companies.

Commentary on Question:

The model solution is an example of a full credit solution.

1. Protect consumers by ensuring insurance products are available at a reasonable/affordable price.
2. Protect consumers by preventing unfair discrimination in the underwriting and rating of policies.
3. Protect consumers and insurers by minimizing the chances insurer insolvency.

4. Continued

(b) Describe three reasons for the direct provision of insurance by governments.

Commentary on Question:
There were five reasons outlined in the source material. Only three were required for full credit. The model solution is an example of a full credit solution.

- To fill insurance needs not met by private insurers
- To force people to buy the insurance
- To achieve collateral social purposes

(c) Explain how social welfare programs differ from social insurance.

Under social insurance, benefits are a matter of right. When benefits in a system are linked to the financial need of the recipients, the system would be considered social welfare.

(d) Identify the following with respect to a JUA:

(i) Issuer of the residual market policies

(ii) How residual market policy premiums are set

(iii) How results of the residual market policies are distributed

(i) A limited number of large insurers that are under contract with the government to issue these policies.
(ii) Premiums are set by the JUA and they are subject to approval by the regulator.
(ii) Pooled results of the JUA are distributed among all insurers writing voluntary market risks for that line of business based on their proportion of voluntary market business.

5. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1d) Complete and interpret selected pages/schedules in the NAIC Annual Statement as included in the resources.

(1e) Understand and apply the concepts of reinsurance accounting.

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 6 (Schedule F, Statutory Credit for Reinsurance)

NAIC Annual Statement

NAIC Statement of Statutory Accounting Principles

- No. 62, "Property and Casualty Reinsurance"

Commentary on Question:

This question tested a candidate's ability to calculate the Schedule F provision. It required the candidate to respond in Excel. An example of a full credit solution is in the Excel solutions spreadsheet. The solution in this file is for explanatory purposes only.

Solution:

(a) Determine GHI's total Schedule F provision for reinsurance for the 2021 Annual Statement.

For J Re:

- Reinsurer is authorized. The slow paying test ratio is required.
- *Test ratio is loss recoverables on paid losses more than 90 days past due (claims not in dispute) divided by the total loss recoverables on paid losses (claims not in dispute) plus the payments received in the prior 90 days.*
- Test Ratio = (560 + 200 – 120 − 100) / (900 + 270 + 440 + 560 + 200 – 330 + 190) = 0.2422 > 0.2 so J Re is slow paying
- *Slow paying authorized reinsurer Schedule F provision is 20% of the greater of the unsecured total recoverables and the (loss recoverables more than 90 days past due including amounts in dispute).*
- J Re Provision ($000) = 0.2 × maximum of 3,850 and 870 = 770
- This is less than total J-Re recoverables, so no capping is required

5. Continued

For K Re:

- Reinsurer is unauthorized.
- *Unauthorized Schedule F provision = [total recoverables – collateral] + [20% of (overdue recoverables and total amounts in dispute*]
- K Re Provision ($000) = [(600 + 350 + 450 + 340 + 160 + 800 + 300 + 100) – (250 + 210)] + 0.2 x (340 + 160) + 0 = 2,740
- This is less than total K-Re recoverables, so no capping is required

The total is 3,510,000. This is greater than GHI's management estimate of 100,000 for uncollectible reinsurance recoverables, so no adjustment is required.

Therefore, GHI's total Schedule F provision for reinsurance is 3,510,000.

(b) Define *authorized reinsurer* as per NAIC Statement of Statutory Accounting Principles No. 62, *Property and Casualty Reinsurance*.

Commentary on Question:
The italicized words in parentheses in the solution shown here were not required for full credit. They are shown for completeness.

An authorized reinsurer is licensed (*or accredited or approved*) by the ceding entity's state of domicile.

6. **Learning Objectives:**

5. The candidate will be able to understand tort law and insurance law with respect to its impact on the general insurance industry.

Learning Outcomes:

(5a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

Sources:

Cappelletti, A., "Government Provision of General Insurance," Society of Actuaries Study Note

Commentary on Question:

This question tested a candidate's knowledge of no-fault insurance.

Solution:

(a) Describe four major shortcomings of a tort system that a no-fault insurance law attempts to rectify.

Commentary on Question:

The model solution is an example of a full credit solution.

1. Ascertaining fault and proving negligence can be difficult, as is the case for automobile accidents and workplace incidents.
2. The court system can be costly.
3. The time from accident to settlement or court award can be quite lengthy.
4. There is inequity in claim payments (i.e., minor injuries tend to be over-compensated while serious injuries tend to be under-compensated).

(b) Describe three distinctive features of no-fault insurance.

Commentary on Question:

There are more than three distinctive features. The model solution is an example of a full credit solution.

1. No-fault insurance systems focus on providing adequate compensation promptly to the injured party.
2. Under no-fault systems, injured parties receive compensation from their own insurer (i.e., first party compensation) without regard to fault.
3. Under no-fault systems the injured parties forgo the tort system.

(c) Compare *pure* no-fault insurance to *modified* no-fault insurance.

Commentary on Question:

The model solution is an example of a full credit solution.

6. **Continued**

Under a pure no-fault plan, the tort liability system is completely replaced by no-fault first-party accident benefits.

Under a modified no-fault plan, the tort liability system is not completely replaced by no-fault first-party accident benefits. Under this system, no-fault benefits are available to all accident victims, while lawsuits are permitted only when a defined threshold is met.

7. Learning Objectives:

3. The candidate will be able to apply the standards of practice regarding the responsibilities of the actuary as defined by regulators and the American Academy of Actuaries.

Learning Outcomes:

(3a) Describe, interpret and apply the applicable Standards of Practice.

(3b) Describe, interpret and apply the responsibilities of the actuary with respect to the Statement of Actuarial Opinion and the Actuarial Report.

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 14 (The General Insurance Actuarial Opinion)

Actuarial Standards Board of the American Academy of Actuaries, Actuarial Standard of Practice (ASOP),

- No. 21, "Responding to or Assisting Auditors or Examiners in Connection with Financial Audits, Financial Reviews, and Financial Examinations"
- No. 36, "Statements of Actuarial Opinion Regarding Property/Casualty Loss and Loss Adjustment Expense Reserves"
- No. 41, "Actuarial Communications"

AAA, Committee on Property and Liability Financial Reporting, "A Public Policy Practice Note, Statements of Actuarial Opinion on Property and Casualty Loss Reserves"

AAA, Council on Professionalism, Discussion Paper Prepared by Task Force on Materiality, "Materiality, Concepts on Professionalism"

Commentary on Question:

This question tested a candidate's understanding of the responsibilities of the AA when dealing with differences of opinion between the AA and the auditor's actuary.

Solution:

(a) Select the type of SAO the AA should render in this situation. Justify your selection.

Commentary on Question:

There are several possible approaches the AA can take in rendering an opinion. The model solution is an example of a full credit solution.

This issue does not directly affect the AA's SAO. The AA should render a reasonable opinion in the SAO as the booked reserves are within the AA's range of reasonability.

7. Continued

(b) Describe how Actuarial Standard of Practice (ASOP) 21 (*Responding to or Assisting Auditors or Examiners in Connection with Financial Audits, Financial Review, and Financial Examinations)* provides guidance in resolving this situation.

Commentary on Question:
The model solution is an example of a full credit solution.

ASOP 21 notes that the AA and the consultant should cooperate with each other in the compilation of the information needed.

(c) Outline how the AA should proceed in this situation.

Commentary on Question:
Widely varying full credit responses are possible. The model solution is an example of a full credit solution. It does not outline all possible considerations for the AA in the scenario provided.

The issue here is that the external auditors of the Company's annual statement will not find the booked amount to be reasonable. This is a concern. The AA should discuss with the consultant the reasons as to why the AA believes the booked reserves to be reasonable.

In discussions with the consultant, the AA should note that the consultant's range of ±2.5% is very narrow even under normal circumstances. It is certainly not reflective of the additional uncertainty created by the unknown effect of the recent legislative change. The consultant should consider this. A ±10% range is more appropriate until the ambiguities in the legislation are resolved.

Furthermore, the AA should note that in the absence of evidence suggesting one study is correct and the other incorrect, both studies results should be considered reasonable, and any range of reasonableness should include results from the use of either study.

8. **Learning Objectives:**

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

(4b) Describe and interpret the current state of general insurance regulation in the U.S. and its development.

Sources:

Insurance Regulation, The Institutes

- Chapter 12 (Insolvency Regulation)

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 12 (Solvency Monitoring)

Commentary on Question:

This question tested a candidate's understanding of insurer insolvency and manners in which the regulatory environment deals with insurer insolvency.

Solution:

(a) Provide three reasons as to why rapid premium growth has been identified as a frequent contributor to insurer insolvency.

Commentary on Question:

There are more than three reasons for this. The model solution is an example of a full credit solution.

1. Rapid growth can reduce the margin for error in insurer operations, particularly when revenues do not sufficiently exceed expenses.
2. Rapid growth is usually a strong indication of inadequate rates and lax underwriting standards.
3. Rapid growth from inadequate rates can generate an increase in net losses such that capital can deteriorate faster than management can handle.

(b) Describe how guaranty funds can increase the amount of risk assumed by insurers.

Commentary on Question:

The model solution is an example of a full credit solution.

This is because the gains of additional risk accrue to the benefit of the owners, while the losses from insolvency are borne by the guaranty fund.

8. Continued

(c) There exist two main methods for funding guaranty funds:

- Pre-funding by risk-based premiums charged to all insurers in a market.
- Funding post-insolvency by assessing the remaining solvent insurers.

Compare the sufficiency of funding under these two methods.

Commentary on Question:
The model solution is an example of a full credit solution.

Risk-based pre-funding:
- The guaranty fund may become be excessive through an extended period without any insolvency.

Post-insolvency funding:
- If a very large insurer fails, the remaining solvent insurers may not be able to meet their obligations to the guaranty fund.

(d) Under the NAIC Post-Assessment Property and Liability Insurance Guaranty Association Model Act, there are guaranty fund coverage limitations which apply in addition to the policy terms and conditions of the original insurance contracts. One of these limitations is the *large net worth deductible*.

Explain what prompted the NAIC to add this limitation to the Model Act.

After the failure of several large commercial lines insurers, funds started paying for sophisticated corporate policyholders' claims.

(e) Explain the purpose of including this limitation in the Model Act.

This limitation was added to reduce coverage for firms with a very large net worth.

9. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1a) Understand and apply the concepts of insurance accounting.

(1d) Complete and interpret selected pages/schedules in the NAIC Annual Statement as included in the resources.

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 7 (Schedule P, Statutory Loss Accounting)

NAIC Annual Statement

Case Study, Fall 2022, SOA Exam General Insurance, Financial and Regulatory Environment – U.S.

Commentary on Question:

This question tested a candidate's ability to derive triangles commonly used in a loss reserve analysis using Schedule P information from the GI FREU Case Study. It required the candidate to respond in Excel. Data from the GI FREU Case Study was preloaded in Excel for the candidate to use in their solution. An example of a full credit solution is in the Excel solutions spreadsheet. The model solution in this file is for explanatory purposes only.

Solution:

Create the following development triangles for R-Dan's private passenger auto liability (PPAL) line of business (net losses and defense and cost containment expenses) for accident years 2018 to 2021:

(i) Average case basis unpaid

(ii) Average payment per closed claim
- Assume that there are no partial payments on claims.

Commentary on Question:

Part (i) was [Sched. Part 2B – Sched. P Part 3B – Sched. P Part 4B] divided by Sched. P Part 5B Section 1

Part (ii) did not indicate whether the average payments were cumulative or incremental, nor did it indicate whether or not counts closed with no payment were to be included. As such, any combination of those two elements was acceptable.

9. **Continued**

The model solution for part (ii) is an example of a full credit solution in which it is assumed the average payments are incremental and claim counts without payments are excluded. Under these assumptions, the part (ii) solution is [Sched. Part 3B incremental differences] divided by [Sched. P Part 5B Section 1 incremental differences]

(i) Average net case basis unpaid

Accident Year	*Age of development (months)*			
	12	24	36	48
2018	5,102	15,037	19,874	23,753
2019	4,690	14,916	22,222	
2020	4,641	17,464		
2021	5,448			

(ii) Average net payment per closed claim (*incremental amounts excluding claims without payments*)

Accident Year	*Age of development (months)*			
	12	24	36	48
2018	3,371	6,653	11,272	530,000
2019	3,490	5,942	25,806	
2020	3,296	7,173		
2021	3,580			

10. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

2. The candidate will understand the analysis of a general insurer’s financial health through prescribed formulas, ratios and other solvency regulation methods.

Learning Outcomes:

(1a) Understand and apply the concepts of insurance accounting.

(1d) Complete and interpret selected pages/schedules in the NAIC Annual Statement as included in the resources.

(2c) Calculate and interpret the results of financial health ratios.

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 2 (Accounting for Insurance Contracts)
- Chapter 11 (Measuring Insurer Financial Strength)

NAIC Annual Statement

Case Study, Fall 2022, SOA Exam General Insurance, Financial and Regulatory Environment – U.S.

Commentary on Question:

This question tested a candidate’s ability to calculate NAIC IRIS ratios and understand the results of the tests of them. It required the candidate to respond in Excel for parts (b) and (c) using data from the GI FREU Case Study. Data from the GI FREU Case Study was preloaded in Excel for the candidate to use in their solution. An example of a full credit solution for parts (b) and (c) is in the Excel solutions spreadsheet. The model solution for parts (b) and (c) in this file is for explanatory purposes only.

Solution:

(a) Explain how values outside the usual range for these reserve ratios could be caused by something beneficial to an insurer's financial health.

Strengthening reserves, which is beneficial to an insurer's financial health, may cause unusually high values for this ratio.

10. **Continued**

(b) Calculate the following NAIC IRIS Ratios for each year, from 2021 to 2024, using R-Dan's actual results for 2021 and revised projections for 2022 to 2024:

(i) IRIS Ratio 2 – Net written premium to policyholders' surplus

(ii) IRIS Ratio 5 – Two-year overall operating ratio

(iii) IRIS Ratio 7 – Gross change in policyholders' surplus

(iv) IRIS Ratio 8 – Change in adjusted policyholders' surplus

Commentary on Question:
The calculations for parts (i), (iii) and (iv) were straightforward, using information provided in the question's Revised Projections table. The calculation for part (ii) was more involved. It required using some values from the case study for years 2020 and 2021. The model solution in the Excel solutions spreadsheet was laid out into steps to make it more manageable to follow.

Refer to the Excel solutions spreadsheet.

(c) Determine whether or not each of the NAIC IRIS Ratios calculated in part (b) falls outside the usual range for the ratio. Provide the usual range for the ratios in your determinations.

	Usual range	2021	2022	2023	2024	
IRIS Ratio 2	< 3.0	2.90	3.48	3.58	3.43	2022, 2023 and 2024 fall outside the usual range
IRIS Ratio 5	< 100%	102.5%	104.7%	101.3%	97.8%	2021, 2022 and 2023 fall outside the usual range
IRIS Ratio 7	-10% to 50%	0.1%	-5.4%	3.4%	10.0%	No years fall outside the usual range
IRIS Ratio 8	-10% to 25%	-4.6%	-10.2%	3.4%	10.0%	2022 falls outside the usual range

11. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1a) Understand and apply the concepts of insurance accounting.

(1c) Describe the elements of the NAIC Annual Statement.

(1d) Complete and interpret selected pages/schedules in the NAIC Annual Statement as included in the resources.

(1e) Understand and apply the concepts of reinsurance accounting.

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 2 (Accounting for Insurance Contracts)
- Chapter 4 (Accounting for Reinsurance Contracts)
- Chapter 5 (The Annual Statement, Nonadmitted Assets and Surplus)
- Chapter 7 (Schedule P, Statutory Loss Accounting)

NAIC Annual Statement

Case Study, Fall 2022, SOA Exam General Insurance, Financial and Regulatory Environment – U.S.

Commentary on Question:

This question tested a candidate's knowledge of how pooling arrangements affect the various pages and exhibits in the Annual Statement. This question required the candidate to use Excel. The model solution in this document does not represent the actual model solution. It is for explanatory purposes only. Refer to the Excel solution file for an example of a full credit solution.

Solution:

(a) Complete the following Schedule P parts for O-Bot's year-end 2021 Annual Statement under this pooling arrangement scenario:

(i) O-Bot – Schedule P – Part 1 – Summary

(ii) O-Bot – Schedule P – Part 2 – Summary

11. **Continued**

Commentary on Question:
Note that while O-Bot only writes Homeowners, its business is pooled with all of R-Dan's business not just Homeowners. O-Bot Schedule P – Part 1 after pooling would be the pooled business times 30%. So, for years prior to 2019, it would be 30% of R-Dan Part 1 for all lines of business. For years 2019 to 2021, it would be 30% of the Part 1 amounts for the two companies combined for all lines of business.

Refer to the Excel solution file for an example of a full credit solution.

(b) Complete the following UWIE parts from R-Dan's year-end 2021 Annual Statement under this pooling arrangement scenario:

(i) R-Dan – UWIE – Part 1B – Premiums Written

(ii) R-Dan – UWIE – Part 2 – Losses Paid and Incurred

(iii) R-Dan – UWIE – Part 2A – Unpaid Losses and Loss Adjustment Expenses

Commentary on Question:
For the UWIE, the lead insurer, R-Dan, treats O-Bot's direct business as reinsurance assumed and the amounts sent back to O-Bot as reinsurance ceded to affiliates. O-Bot's amounts ceded to non-affiliates would be included as part of R-Dan's ceded to non-affiliates, under the assumption that R-Dan would have purchased the same external reinsurance. This is what is presented in the Excel solution file. It was also acceptable to make the assumption that O-Bot would still purchase the external reinsurance it had purchased and then ceded the net amount to the pool. This is not shown in the Excel solution file.

Refer to the Excel solution file for an example of a full credit solution.

(c) Calculate the following Schedule F entries from R-Dan's year-end 2021 Annual Statement under this pooling arrangement scenario:

(i) R-Dan – Schedule F – Part 1 – Column 7 (*Reinsurance on Known Case Losses and LAE*), Row 9999999 (Total)

(ii) R-Dan – Schedule F – Part 3 – Column 6 (*Reinsurance Premium Ceded*), Row 9999999 (Total)

11. Continued

Commentary on Question:

Note that there was a minor error for part (ii) as what was labeled as Column 8 should have been labeled as Column 6. Grading of this question took this into account.

For part (i), Schedule F Part 1 treats business coming into the pool from affiliates as assumed business. R-Dan's Schedule F – Part 1 column 7 total should equal the sum of columns 13, 17 and 21 from O-Bot's Schedule P – Part 1A.

For part (ii), Schedule F Part 3 treats ceded business the same as the UWIE. R-Dan's Schedule F – Part 3 column 8 total should equal the sum of columns 4 and 5 from R-Dan's UWIE Part 1B.

(i) R-Dan Sched. F – Part 1, Col. 7 total row = 19,530 + 500 + 3,800 = 23,830

(ii) R-Dan Sched. F – Part 3, Col. 8 total row = 223,080 + 13,200 = 236,280

12. **Learning Objectives:**

3. The candidate will be able to apply the standards of practice regarding the responsibilities of the actuary as defined by regulators and the American Academy of Actuaries.

Learning Outcomes:

(3a) Describe, interpret and apply the applicable Standards of Practice.

Sources:

Actuarial Standards Board of the American Academy of Actuaries, Actuarial Standard of Practice (ASOP),

- No. 38, "Catastrophe Modeling"

Commentary on Question:

This question tested a candidate's understanding the requirements of ASOP 38.

Solution:

(a) Describe the level of effort that should be undertaken by the actuary in understanding and evaluating the model.

It should be consistent with the intended purpose and the model output's materiality to the results of the actuarial analysis.

(b) Describe three items that the actuary should take into account when using a model developed by an expert.

Commentary on Question:

There are more than three items. Only three were required for full credit. The model solution is an example of a full credit response.

- Whether the individual or individuals who developed the catastrophe model are experts in the applicable field.
- The extent to which the catastrophe model has been reviewed or validated by experts in the applicable field,
- Any known differences of opinion among experts concerning aspects of the model that could be material to the actuary's use of it.

(c) ASOP No. 38 requires the actuary to understand the user input for the catastrophe model.

Describe what this requirement entails.

Commentary on Question:

This requirement entails a number of things for the actuary to understand. Not all were required for full credit. The model solution is an example of a full credit response.

12. **Continued**

The actuary should take reasonable steps to confirm that the precision and accuracy of the user input are consistent with the intended purpose.

Furthermore, the actuary should have an understanding of the relationship between the user input and catastrophe model output.

(d) ASOP No. 38 requires the actuary to validate that the output reasonably represents that which is being modeled.

Describe three potential ways to validate the model output.

Commentary on Question:
There are more than three ways to validate the model output. Only three were required for full credit. The model solution is an example of a full credit response.

- Comparing the output to those of an alternative model, where appropriate.
- Comparing the output with historical observations, if applicable.
- Evaluating the reasonableness of changes in the output due to variations in the user input.

13. Learning Objectives:

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

(4a) Describe the functions of key regulatory bodies in the U.S. including the NAIC and SEC.

(4b) Describe and interpret the current state of general insurance regulation in the U.S. and its development.

Sources:

Mayer Brown, "Understanding the New Financial Reform Legislation: The Dodd-Frank Wall Street Reform and Consumer Protection Act"

Commentary on Question:

This question tested a candidate's knowledge of the Dodd-Frank Act as it pertains to general insurance.

Solution:

(a) Describe one of the changes to the regulation of non-admitted insurance that was introduced in the Dodd-Frank Act.

Commentary on Question:

There are several changes that were introduced. Only one was required for full credit. The model solution is an example of a full credit solution.

Only the home state of an insured party may impose a premium tax on insurance obtained from a non-admitted insurer.

(b) Describe one type of state reinsurance regulation for non-domiciled insurers that is preempted under the Dodd-Frank Act.

Commentary on Question:

There are several types that are preempted under the Act. Only one was required for full credit. The model solution is an example of a full credit solution.

Regulations that attempt to enforce a reinsurance contract on terms different than those set forth in the contract itself.

(c) Identify two lines of business that are not under the FIO's scope of authority.

13. Continued

Commentary on Question:
There are several lines that are not under the FIO's scope of authority. Only two were required for full credit. The model solution is an example of a full credit solution.

crop insurance, health insurance

(d) Describe one aspect of the business of insurance that the FIO is tasked to monitor.

Commentary on Question:
There are several aspects that the FIO is tasked to monitor. Only one was required for full credit. The model solution is an example of a full credit solution.

Identify issues in the regulation of insurance that could contribute to a systemic crisis in the insurance industry or the U.S. financial system.

(e) Explain how compliance with FIO data requirements are enforced.

The FIO is authorized to issue subpoenas that can be enforced by federal district courts.

14. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1e) Understand and apply the concepts of reinsurance accounting.

Sources:

General Insurance Financial Reporting Topics, Fourth Edition, Society of Actuaries

- Chapter 4 (Accounting for Reinsurance Contracts)

NAIC Statement of Statutory Accounting Principles,

- No. 62, "Property and Casualty Reinsurance"

Commentary on Question:

This question tested a candidate's understanding of contract terms that may affect whether or not the contract meets the requirements of reinsurance accounting.

Solution:

(a) Determine which terms, A through K, will likely prevent it from being accounted for as reinsurance under the rules of U.S. statutory accounting.
Justify your determinations.

Commentary on Question:

Six of the terms (A, E, F, I, J, K) will likely prevent it from being accounted for as reinsurance under U.S. statutory accounting. Five of these terms were required for full credit. The model solution is an example of a full credit solution that makes this determination for A, E, F, I and J.

Term A: This term includes a retroactive period which may prevent reinsurance accounting.

Term E: This term delays recoveries due to PCI which will prevent reinsurance accounting.

Term F: This term is an insolvency clause that reduces the reinsurer's obligations. This will prevent reinsurance accounting.

Term I: This sliding scale commission term affects the transfer of risk. The sliding scale is very wide and will likely prevent reinsurance accounting.

Term J: This cancelation clause permits the reinsurer to cancel the agreement if it appears likely to suffer a significant loss. This prevents a significant transfer of risk and will prevent statutory reinsurance accounting.

14. Continued

(b) Propose a potential revision to each term, if needed, so that the agreement may be accounted for as reinsurance under the rules of U.S. statutory accounting.

Commentary on Question:
Six terms (A, E, F, I, J, K) required revisions so that the agreement may be accounted for as reinsurance under the rules of U.S. statutory accounting. Proposing revisions to four of these six could earn full credit. The model solution is an example of a full credit solution that proposes revisions to A, E, F and I

Term A: The coverage period should be Jan. 1, 2022 to Dec. 31, 2022 so it does not include a retroactive coverage period.

Term E: Payments should not be in a lump sum. They should be made without delay. At a minimum they should be made quarterly with the reports.

Term F: The insolvency clause should state that Q-Re is still responsible for its obligations even if PIC is insolvent.

Term I: The swing commission needs a narrower sliding scale, such as a swing of 0.5-to-1 from a minimum rate of 15% at a 75% loss ratio to a maximum rate of 30% at a 45% loss ratio. Alternatively, this could be changed to fixed commission rate of 25%.

15. **Learning Objectives:**

2. The candidate will understand the analysis of a general insurer's financial health through prescribed formulas, ratios and other solvency regulation methods.

Learning Outcomes:

(2i) Discuss the function of credit rating agencies and their impact on general insurers.

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 13 (General Insurance Financial Ratings)

Commentary on Question:

This question tested a candidate's broad understanding of financial rating agencies and how they affect the business of general insurance.

Solution:

(a) Identify two benefits of a credit rating from the perspective of investors.

Commentary on Question:

The model solution is an example of a full credit solution.

- Make Securities markets more efficient
- Reduce information costs among investors

(b) Identify two benefits of a financial rating from the perspective of the insurance industry.

Commentary on Question:

The model solution is an example of a full credit solution.

- Make insurance/reinsurance markets more efficient
- Reduce information costs among insurance purchasers

(c) Explain why financial ratings are particularly important for the following:

(i) Reinsurance contracts

(ii) Surety insurance contracts

(iii) Homeowners insurance contracts

(iv) Structured settlements

15. Continued

Commentary on Question:
The model solution is an example of a full credit response for each of (i) to (iv). It does not represent the only reason why financial ratings are particularly important for each of (i) to (iv). Note that to earn full credit, the reasons provided must specifically relate to the type of contract.

(i) Reinsurance: Some reinsurance treaties explicit link ratings and security, so the insurer is protected if the credit quality of the reinsurer deteriorates.

(ii) Surety: Principals often require construction firms to obtain surety contracts from A-rated insurance companies to ensure that the construction firm will fulfill the obligations of the construction project.

(iii) Homeowners: Bank often require homeowners insurance coverage on mortgaged properties and that this insurance be from insurers with investment grade financial ratings.

(iv) Structured Settlements: To ensure that the claimant receives secure funding of periodic payments for life, courts and plaintiff attorneys rely on insurer financial ratings for the insurer providing the annuity.

16. Learning Objectives:

5. The candidate will be able to understand tort law and insurance law with respect to its impact on the general insurance industry.

Learning Outcomes:

(5a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

(5e) Describe and interpret legal cases/issues included in the syllabus resources.

Sources:

Excerpts from Business Law for Insurance Professionals, Institutes Custom Publishing, Assignment 2 (Tort Law)

Cappelletti, A., "Tort Law: Topics for General Insurance Actuaries," Society of Actuaries Study Note

Commentary on Question:

This question tested a candidate's understanding of punitive damages under tort law.

Solution:

(a) Explain how liability insurers are exposed to the cost of a punitive damages award.

They are exposed through claims against them directly for their own intentional acts of misconduct.

(b) Punitive damages awards are only indicated for reprehensible conduct. The Supreme Court of the United States' decision in *BMW of North America v. Gore* outlined five factors for consideration to determine the reprehensibility of a defendant's conduct.

State three of these five factors.

Commentary on Question:

Any three of the five factors could be stated to earn full credit. The model solution is an example of a full credit response.

1. The harm caused was physical as opposed to economic.
2. The tortious conduct evinced an indifference to or a reckless disregard of the health or safety of others.
3. The target of the conduct had financial vulnerability.

16. Continued

(c) The size of punitive damages awards was addressed by the Supreme Court in its decision in the case of *State Farm Mutual Automobile Insurance Co. v. Campbell*.

Explain the guidance this decision provided regarding the size of punitive damages awards.

Commentary on Question:
The model solution is an example of a full credit response.

Punitive damages awards should have a single digit ratio of the punitive damages award to the compensatory damages award in order to satisfy the Due Process Clause.

(d) The defendant's conduct on non-parties is an issue that has been brought forth by plaintiffs in cases involving punitive damages awards. The Supreme Court's decision in *Philip Morris USA v. Williams* addressed this issue.

Explain how a defendant's conduct on non-parties may or may not be used based on this decision.

Commentary on Question:
The model solution is an example of a full credit response.

Consideration of a defendant's conduct on non-parties for the assessment of a punitive damages award is a violation of due process and not permitted. However, a defendant's conduct on non-parties may be used to establish reprehensibility.

17. **Learning Objectives:**

1. The candidate will understand the elements of financial reporting for general insurance companies.

3. The candidate will be able to apply the standards of practice regarding the responsibilities of the actuary as defined by regulators and the American Academy of Actuaries.

Learning Outcomes:

(1a) Understand and apply the concepts of insurance accounting.

(1e) Understand and apply the concepts of reinsurance accounting.

(3a) Describe, interpret and apply the applicable Standards of Practice.

(3b) Describe, interpret and apply the responsibilities of the actuary with respect to the Statement of Actuarial Opinion and the Actuarial Report.

(3e) Discuss the International Actuarial Association position on the function of the actuary in prudential supervision.

Sources:

General Insurance Financial Reporting Topics, Fourth Edition, Society of Actuaries

- Chapter 14 (Overview of the General Insurance Statement of Actuarial Opinion)

International Actuarial Association, The Function of the Actuary in Prudential Supervision

Commentary on Question:

This question tested a candidate's knowledge of various issues regarding actuarial functions and accounting.

Solution:

(a) The International Actuarial Association (IAA) has defined five key areas where active actuarial participation can be valuable in prudential supervision.

Identify four of these areas.

Commentary on Question:

The model solution is an example of a full credit solution.

- Pricing and product design
- Safeguarding policyholder interests
- Establishing aggregate policy and claim liabilities
- Determining appropriate capital

17. Continued

(b) According to the textbook *General Insurance Financial Reporting Topics*, U.S. insurance regulators are interested in four attributes for booked reserves: *sufficiency, unbiasedness, soundness and reasonability*.

Describe three of the four attributes:

Commentary on Question:
The model solution is an example of a full credit solution.

- Sufficiency – Reserves that provide an amount to meet obligations.
- Soundness – Reserves based on sound actuarial methods, that may or may not include a margin to meet obligations in adverse scenarios.
- Unbiasedness – Reserves that represent the expected value of the obligations.

(c) The NAIC Instructions for the Statement of Actuarial Opinion (SAO) define five opinion categories, the most common of which is a reasonable provision.

Define each of the other four categories.

- Deficient – When carried reserves are below the low end of the actuarial range.
- Redundant – When carried reserves are above the high end of the actuarial range.
- Qualified – When reserves for certain material items cannot be reasonably estimated by the actuary.
- No Opinion – The actuary cannot make a determination/conclusion due to deficiencies or limitations in the data or other information.

(d) Describe the reporting of *assumed* retroactive reinsurance in the Annual Statement with respect to the following:

(i) Liabilities

(ii) Surplus

(i) Assumed retroactive reinsurance is shown as a write-in item on the liability side of the balance sheet.

(ii) The surplus gain from retroactive reinsurance is coded as special surplus until the recoverables are collected.

18. **Learning Objectives:**

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

(4e) Describe the development of general insurance programs controlled by government or collective insurance industry organizations and their mechanisms of operation.

Sources:

American Academy of Actuaries, Flood Insurance Work Group, Public Policy Monograph, “The National Flood Insurance Program: Challenges and Solutions”

Cappelletti, A., “Government Provision of General Insurance,” Society of Actuaries Study Note

Commentary on Question:

This question tested a candidate’s knowledge of flood insurance and the operation of the NFIP.

Solution:

(a) Explain how private flood insurance could weaken the financial position of the NFIP.

Commentary on Question:

The model solution is an example of a full credit solution.

Private insurers would likely take advantage of a more refined risk class structure to profitably write policies that are being significantly overpriced within the broad NFIP classes. This would increase the proportion of unprofitable risks within the NFIP. Coupled with the reduction in revenue lost to private insurers, this would increase the expected operating losses for the NFIP.

(b) Compare the coverage provided by NFIP policies to those provided by private insurance flood policies. Include two coverage differences in your comparison.

Commentary on Question:

There are more than two coverage differences to compare. The model solution is an example of a full credit solution.

- NFIP policies have low coverage limits that are set by statute. Private insurance policy limits are limited only by the insured property value and the insurer’s underwriting preference.
- NFIP policies only use actual-cash-value coverage. Private insurers normally offer replacement-cost-value coverage.

18. Continued

(c) Explain how the NFIP can continue operating after a catastrophic loss exhausts its available funds.

The NFIP may borrow funds from the U.S. Treasury, thus it has the ability to operate in a debt position. However, NFIP borrowing authority is limited.

In practice, Congressional approval has been given to increase this limit whenever it is exhausted by a catastrophe so that the NFIP can remain operational.