

Exam GIFREU

Date: Friday, April 29, 2022

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 19 questions numbered 1 through 19 with a total of 100 points.

The points for each question are indicated at the beginning of the question. Questions 9 to 12 pertain to the Case Study.

2. 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 provided in this document.

Written-Answer Instructions

1. Each question part or subpart should be answered either in the Word document or the Excel file as directed. Graders will only look at work in the indicated file.

- a) In the Word document, answers should be entered in the box marked ANSWER. The box will expand as lines of text are added. There is no need to use special characters or subscripts (though they may be used). For example, β_1 can be typed as beta_1 and σ^2 can be typed as sigma^2.

- b) In the Excel document formulas should be entered. Performing calculations on scratch paper or with a calculator and then entering the answer in the cell will not earn full credit. Formatting of cells or rounding is not required for credit. Rows can be inserted to the answer input area as required to provide space for your answer.

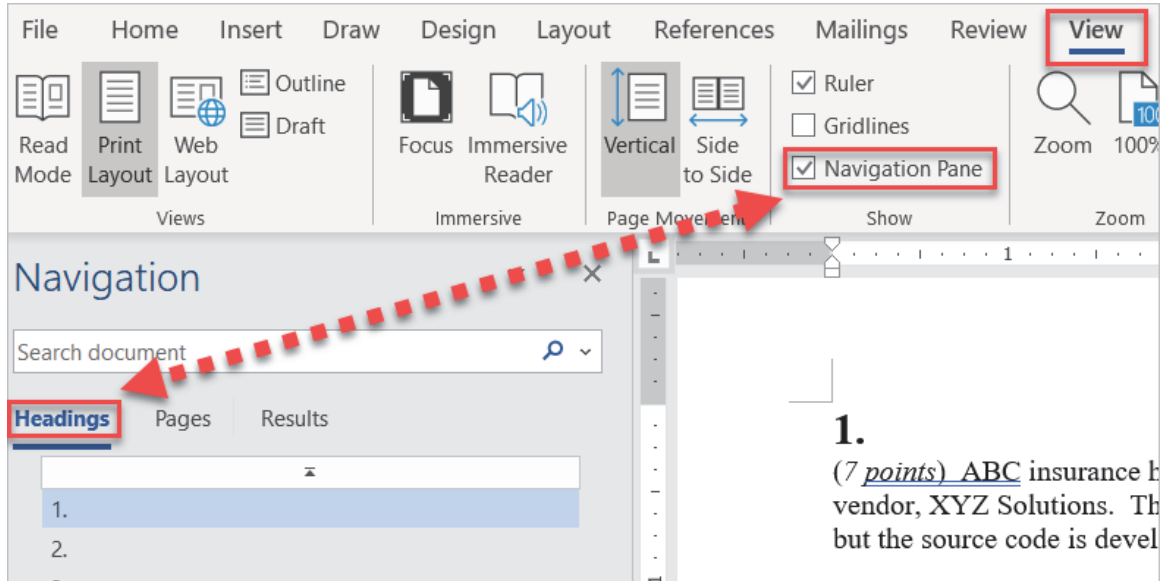
- c) Individual exams may provide additional directions that apply throughout the exam or to individual items.

2. The answer should be confined to the question as set.
3. Prior to uploading your Word and Excel files, each file should be saved and renamed with your five-digit candidate number in the filename.
4. The Word and Excel files that contain your answers must be uploaded before the five-minute upload period expires.

Navigation Instructions

Open the Navigation Pane to jump to questions.

Press Ctrl+F, or click View > Navigation Pane:



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.

1.

(5 points) Most NAIC IRIS ratios create exceptional values only when the ratio is above a certain value. However, four of the thirteen NAIC IRIS ratios create exceptional values when the ratio is outside a specified range of values.

- (a) (0.5 points) Identify two of these four NAIC IRIS ratios. The two ratios identified should not have resultant values that overlap significantly.

ANSWER:

- (b) (2 points) Explain why values that are too high or too low may be signs of financial distress for each of the two NAIC IRIS ratios identified in (a).

ANSWER:

NAIC IRIS Ratio 4 (Surplus Aid to Policyholders' Surplus) produces exceptional values only when greater than 15%.

- (c) (2.5 points) Provide the following regarding IRIS Ratio 4:
- (i) The formula for calculating surplus aid
 - (ii) A reason that an exceptionally high value may be a sign of financial distress
 - (iii) The effect that an exceptionally high value has on other IRIS ratios
 - (iv) The additional IRIS calculations that would likely need to be done when this ratio produces an exceptional value

ANSWER:

- (i)
- (ii)
- (iii)
- (iv)

2.

(4 points)

- (a) (1 point) State two reasons why U.S. statutory accounting requires certain assets to be designated as nonadmitted.

ANSWER:

A U.S. general insurer/reinsurer is completing its statutory annual statement. It has \$7.35 million in policyholders' surplus.

- (b) (3 points) Determine the admitted amount that should be booked by this company for each of the following assets. Include the reasoning supporting each determination.
- (i) Ten automobiles (for use by claims adjusters) purchased five years ago for a total of \$300,000 with a total current market value of \$80,000 and total current depreciated value of \$150,000.
 - (ii) Assumed premium balances from insurers, 70 days past due, in the amount of \$100,000.
 - (iii) Unsecured accrued retrospective premiums in the amount of \$500,000.
 - (iv) Reinsurance recoverables, from a slow-paying authorized reinsurer, in the amount of \$200,000. Management's best estimate is that \$10,000 of this amount is uncollectible.
 - (v) Goodwill from the purchase of an entity. The purchase price was \$3 million and the acquired entity's surplus was \$2.2 million.
 - (vi) Operating system software, with a useful life of four years, purchased for \$360,000 two years ago.

ANSWER:

- (i)
- (ii)
- (iii)
- (iv)
- (v)
- (vi)

3.

(8 points) LIT, a U.S. liability insurer, has hired a consultant to be the Appointed Actuary (AA) for the preparation of its first Statement of Actuarial Opinion (SAO). In prior years, LIT had an exemption from filing an SAO. However, LIT is not exempt for the current year.

LIT provided the AA with data to prepare the SAO. The AA has selected a materiality standard of \$500,000 for the RMAD in the SAO.

The AA reviewed the data and raised the following issues to LIT:

- The reserving data appears reasonable and reconciled to the Schedule P data on an all-lines combined basis. However, the data included several differences totaling approximately \$300,000 when compared on a line of business (LOB) basis.
- LIT does have liabilities for asbestos and environment (A&E) claims. However, LIT did not provide any information related to these claims because they believe them to be immaterial.
- Within LIT's Annual Statement, the Schedule P Part 1 Salvage and Subrogation (S&S) columns (10 and 23) contain zeros for all years and all LOBs.

After informing LIT of these data issues, the AA was provided with the following additional information:

- LIT's reserving data is based upon policy level groupings such that some policies, which include more than one LOB will be grouped into the LOB with the greatest contribution to premium. In contrast, LIT's Schedule P data is reported in true LOB detail based on claims data. The two data sources do reconcile after minimal necessary aggregation.
- LIT provided two sets of A&E claims data. One from the claims department and one from the accounting department. The reserves in the two data sets do not match and there is no explanation for the difference. The claims data shows A&E reserves in the amount of \$350,000 while the accounting data shows \$500,000. Both departments state that the data includes only case loss reserves (including defense and cost containment expenses) and excludes IBNR. For the carried reserves, the company used the accounting data with no IBNR. LIT notes that A&E data has been removed from LIT's reserving data. LIT does not disclose A&E liabilities in the Annual Statement.
- Current reserving data is net of S&S amounts. LIT has data available to complete the S&S columns but proposes waiting until next year to disclose the S&S amounts in Schedule P Part 1.

3. Continued

Describe how the AA should proceed in the preparation of LIT's SAO, with respect to each of the following data issues:

- (i) Schedule P reconciliation
- (ii) A&E claims data
- (iii) S&S reporting in the Annual Statement

Your response should reference the following sources if applicable:

- Actuarial Standards of Practice (ASOPs)
- Statements of Statutory Accounting Principles (SSAPs)
- Additional guidance on SAOs
 - NAIC SAO Instructions
 - Academy Public Policy Practice Note: Statements of Actuarial Opinion on Property and Casualty Loss Reserves Developed by The Casualty Practice Council's Committee on Property and Liability Financial Reporting (Practice Note)

ANSWER:

4.

(4 points) The doctrine of *res ipsa loquitor* has been applied in the courts for certain tort cases.

- (a) (1 point) Explain this doctrine.

ANSWER:

Application of this doctrine requires that three conditions are met.

- (b) (1.5 points) Describe these three conditions.

ANSWER:

- (c) (1.5 points) Explain how the ruling by the New York State Court of Appeals in the case of *State v. Lourdes Hospital* expanded the use of this doctrine.

ANSWER:

5.

(4 points) VK is the lead pricing actuary for a U.S. general insurance company (the Company) that writes homeowners insurance. VK is responsible for the development and filing of rates for the Company.

The Company purchased a new credit score model for use in its ratemaking. VK is familiar with the model. VK understands the components of the model, user input for the model and the model's output.

In validating the model, VK noted that the model output indicates that credit scores are correlated with occupation, gender and race. Correlation with occupation is high. Correlations with gender and race are not high but still statistically significant.

The Company currently has a discount for certain occupation classes that have had better claims experience.

Company management wants to use this model for its homeowners insurance business in a file-and-use state that requires certification of the rates by an actuary. The state has recently lifted its prohibition on the use of credit information for homeowners insurance rating and underwriting under certain circumstances.

Outline VK's considerations in reviewing this proposal and potential next steps.

ANSWER:

6.

(4 points) You are working on the U.S. federal tax calculations for a U.S. general insurer and are given the following information:

Investment Income Amounts (in \$ millions)	2021
Taxable interest income	5.65
Interest income from tax-exempt municipal bonds	6.50
Dividends received	1.96
Realized capital gains	2.50

The company has no affiliates.

- (a) (1 point) Demonstrate that the company's taxable investment income for 2021 is \$11 million.

<i>Provide the response for this part in the Excel spreadsheet.</i>

You are given the following additional information for the company:

Amounts (in \$ millions)	2021	2020
Net unearned premium reserve as at year-end	35	25
Undiscounted net loss and LAE reserves as at year-end	91	75
Tax-basis discounted net loss and LAE reserves as at year-end	77	67
Net written premium	60	40
Net loss and LAE paid	36	28
Tax-deductible other expenses	21	13
Taxable investment income	11	8

- (b) (3 points) Calculate the company's 2021 taxable income using each of the following methods:
- (i) Indirect method
 - (ii) Direct method

<i>Provide the response for this part in the Excel spreadsheet.</i>

7.

(4 points) The United Kingdom (UK) has experienced much lower liability costs from asbestos exposure than the United States. This is despite the UK having had greater use of asbestos and higher death rates from asbestos exposure compared to the United States.

- (a) (2 points) Explain why liability costs from asbestos exposure have been relatively much lower in the UK than in the United States.

ANSWER:

The bankruptcy of numerous asbestos manufacturers and manufacturers of products that used asbestos in the United States was triggered by tort actions, coupled with the lack of comprehensive class action settlements. Through these bankruptcies, trust funds have been established to compensate injured parties.

- (b) (2 points) Describe the issues encountered by the asbestos trust funds in their attempt to compensate injured parties and reduce asbestos torts.

ANSWER:

8.

(5 points)

- (a) (1.5 points) Provide three reasons why insurance markets have been found to be imperfectly competitive.

ANSWER:

- (b) (1 point) Identify the following with respect to Fair Access to Insurance Requirements (FAIR) plans in the United States:

- (i) the risk-taking entity
- (ii) the business addressed

ANSWER:

- (c) (1 point) Identify the following with respect to *surplus lines* in the United States:

- (i) the risk-taking entity
- (ii) the business addressed

ANSWER:

In the United States, insurance is mainly regulated by the states. However, the federal government has involved itself in the regulation of insurance. One such example is the Gramm-Leach-Bliley Act of 1999 (GLB).

- (d) (0.5 point) Describe the key issue that GLB addressed with respect to banks writing insurance.

ANSWER:

- (e) (1 point) Explain how GLB addressed this key issue.

ANSWER:

**Questions 9 to 12 pertain to the Case Study.
Each question should be answered independently.**

9.

(5 points) The NAIC Annual Statement contents includes *Notes to Financial Statements*. Within these notes is *Note 25: Changes in Incurred Losses and Loss Adjustment Expenses*.

R-Dan's Note 25 begins with the following text:

“Incurred losses and loss adjustment expenses represent the sum of paid losses, loss adjustment expenses and reserve changes. Reserves are estimates of the unpaid amounts for losses that have already occurred. This includes amounts for incurred but not reported losses. Establishing appropriate reserves is an inherently uncertain process. As such, the ultimate amount of losses may be significantly different from the recorded amounts that are based upon best estimates from R-Dan management.”

(a) (0.5 points) Describe the purpose of Note 25.

ANSWER:

(b) (4.5 points) Complete R-Dan's Note 25 for the 2021 Annual Statement, including both required numbers and narrative, using the information provided in the case study.

The response for this part may be provided in this Word document or the Excel spreadsheet.

ANSWER:

**Questions 9 to 12 pertain to the Case Study.
Each question should be answered independently.**

10.

(7 points)

- (a) (2.5 points) Calculate R-Dan's 2021 NAIC Risk-Based Capital (RBC) *base loss and LAE reserve risk charge* for Homeowners/Farmowners (H/F).

Provide the response for this part in the Excel spreadsheet.

R-Dan's 2021 RBC *base loss and LAE reserve risk charge* by line of business, excluding H/F, is as follows:

Item	Amount (000)
Private Passenger Liab./Med. (PPL)	28,180
Commercial Auto/Truck Liab./Med. (CAL)	50
Auto Physical Damage (APD)	340
Special Property (SP)	0

- (b) (2 points) Calculate R-Dan's NAIC RBC *underwriting risk charge for reserve risk before conditional adjustment*.

Provide the response for this part in the Excel spreadsheet.

The components of R-Dan's 2021 NAIC RBC *credit risk charge before conditional adjustment* are as follows:

Item	Amount (000)
Investment income due and accrued	90
Federal tax recoverables	470
Recoverable from affiliates	100
Reinsurance recoverables	3,100

- (c) (1 point) Calculate R-Dan's 2021 NAIC RBC charge R_3 (*credit risk charge after conditional adjustment*).

Provide the response for this part in the Excel spreadsheet.

10. Continued

- (d) (0.5 points) Explain why the RBC calculation includes the conditional adjustment.

Provide the response for this part in the Excel spreadsheet.

You are given the following additional information regarding R-Dan's 2021 NAIC RBC calculation:

Item	Amount (000)
R ₀ RBC Charge	60
R ₁ RBC Charge	8,820
R ₂ RBC Charge	5,280
R ₄ RBC Charge <i>(after conditional adjustment)</i>	33,860
R ₅ RBC Charge	47,000
R _{CAT} RBC Charge	21,860

- (e) (1 point) Calculate R-Dan's 2021 NAIC RBC Ratio.

Provide the response for this part in the Excel spreadsheet.

*Questions 9 to 12 pertain to the Case Study.
Each question should be answered independently.*

11.

(6 points) R-Dan is undergoing a review by a financial rating agency. The agency focused on R-Dan's business strategy and growth by looking at the company's historical results and projections. R-Dan management readily admits that it has begun sacrificing profitability for growth and that this will continue at least until 2023 at which point it will then address profitability. The rating agency has access to the following documents:

- The company's business strategy (*refer to pages 3 to 6 of the Case Study*)
- Statutory financial statements
- Company projections
- Statement of Actuarial Opinion (SAO)
- Actuarial Opinion Summary (AOS)
- Actuarial Report

- (a) (2 points) Explain what concerns the rating agency may have regarding R-Dan's year-end 2021 reserves.

ANSWER:

- (b) (2 points) Explain what concerns the rating agency may have regarding R-Dan's projected underwriting results.

ANSWER:

An analysis by the rating agency projects a likely net underwriting loss of 80,000,000 for 2022 instead of the 30,000,000 net underwriting loss as projected by R-Dan. This would result in a net loss after taxes in 2022 of about 30,000,000 instead of the net income after taxes of 10,000,000 as shown in R-Dan's projections.

- (c) (2 points) Explain the likely implications for R-Dan if the rating agency's projection for 2022 is accurate.

ANSWER:

*Questions 9 to 12 pertain to the Case Study.
Each question should be answered independently.*

12.

(6 points) You are given the following information for R-Dan's private passenger auto liability (PPAL) line of business:

PPAL (amounts in millions)	Current Year (2021)	Prior Year (2020)
Net unpaid losses	207.0	176.2
Net unpaid loss adjustment expenses for Defense and Cost Containment (DCC)	33.9	30.6
Net unpaid loss adjustment expenses for Adjusting and Other (AO)	7.9	7.1
Agents' balances	22.0	19.3

You have been informed that while the total amount in the current year for *Taxes, Licenses & Fees* was correct at \$14.4 million as shown in the 2021 Insurance Expense Exhibit (IEE), the amount for PPAL was understated by \$1 million and the amount for private passenger auto physical damage was overstated by \$1 million.

Determine the following items for R-Dan's 2021 corrected IEE using the restated amount for the current year's *Taxes, Licenses & Fees*:

- (i) (1 point) Prepaid expense ratio for PPAL
- (ii) (2 points) Investment gain ratio
- (iii) (3 points) Investment gain on funds attributable to capital and surplus for PPAL

Provide the response in the Excel spreadsheet.

13.

(5 points) Describe the difference between the interest method and the present value method for deposit accounting of reinsurance under U.S. GAAP in terms of the following:

- (i) (1 point) Cash flows/Income pattern used
- (ii) (1.5 points) Discount rate used
- (iii) (1.5 points) Amortization period of the deposit
- (iv) (1 point) Income presentation in the Annual Statement for changes in the deposit

ANSWER: (i) (ii) (iii) (iv)

14.

(7 points)

- (a) (0.5 points) Identify two common justifications for the regulation of insurance.

ANSWER:

The McCarran-Ferguson Act (1945) requires that the Sherman Act, the Clayton Act and other federal Acts apply to the business of insurance only if the states are not regulating the activities described in these acts. However, there are two exceptions to this requirement.

- (b) (1 point) Describe these two exceptions.

ANSWER:

The following concepts have been used to explain insurance regulatory failures:

- Regulatory fallibility
- Regulatory forbearance
- Regulatory capture

- (c) (2 points) Define each of the three concepts identified above.

ANSWER:

- (d) (1 point) Explain how regulatory forbearance may affect the costs borne by policyholders and insurance guaranty funds.

ANSWER:

Even though individual states are the primary regulator of insurance, there is substantial uniformity of insurance regulation among the states.

- (e) (1 point) Describe two reasons for this.

ANSWER:

14. Continued

- (f) (1.5 points) Provide arguments for and against the state system of insurance regulation versus a federal system.

ANSWER:

15.

(5 points) An insurance contract includes special characteristics that distinguish the contract as an insurance contract. One of these is that an insurance contract is a *contract of adhesion*.

- (a) (1 point) Describe what is meant by *contract of adhesion*.

ANSWER:

- (b) (1 point) Identify four other special characteristics included in most insurance contracts.

ANSWER:

- (c) (1 point) Describe two of the four other special characteristics identified in part (b).

ANSWER:

Statements on insurance applications are categorized as either representations or warranties. *False representation* makes a contract voidable.

- (d) (1.5 points) Identify the three elements required for an insurer to establish *false representation* by the insured.

ANSWER:

- (e) (0.5 points) Describe what distinguishes *false representation* from *fraud*.

ANSWER:

16.

(5 points)

- (a) (1 point) Explain why intercompany pooling agreements do not typically represent agreements of true risk transfer.

ANSWER:

- (b) (2.5 points) Determine how an intercompany pooling agreement will affect the following components of a U.S. statutory Annual Statement (AS) exhibit for a pool participant.

- (i) Income Statement (i.e., AS page 4) components:
- Underwriting income
 - Investment income
 - Capital and surplus account
- (ii) Assets (i.e., AS page 2) component:
- Cash and invested assets
- (iii) Liabilities, Surplus and Other Funds (i.e., AS page 3) components:
- Losses and loss and adjustment expenses
 - Surplus as regards policyholders

ANSWER:

(i)

(ii)

(iii)

Under a scenario of changing percentages of intercompany pooling participation from year to year, the historical figures in the current year's Schedule P may not agree with the corresponding Schedule P entries from the AS of previous years.

- (c) (1 point) Explain how Schedule P should be constructed under this scenario.

ANSWER:

16. Continued

- (d) (0.5 points) Explain how intercompany reinsurance transactions that are not pooling agreements are treated in Schedule P.

ANSWER:

17.

(5 points) Actuarial Standard of Practice (ASOP) 43 identifies a problem with using the term “best estimate” for an actuarial estimate of unpaid claims.

- (a) (0.5 points) Describe this problem.

ANSWER:

You are the Appointed Actuary (AA) for a U.S. general insurance company (the Company). You have implemented a new method in your actuarial estimation process based on the current environment which includes material COVID-related claims. You believe the new method is more appropriate.

Amounts in \$ millions	Old Method	New Method
Actuarial central estimate for unpaid claims	145	155
Actuarial range of reasonable estimates	140-150	150-160

- Management is booking reserves of \$145 million based on the old method.
- The Company’s statutory surplus is \$50 million.
- The Company’s net income for the year is \$10 million.

- (b) (0.5 points) Select the type of Statement of Actuarial Opinion (SAO) you would render for the Company in this scenario. Justify your selection.

ANSWER:

- (c) (1 point) Describe two disclosures you would include in your SAO in this scenario.

ANSWER:

- (d) (1 point) Draft a Relevant Comments paragraph to address the RMAD in this scenario.

ANSWER:

17. Continued

The carried reserves result in a one-year loss development in excess of 5% of surplus in at least three of the past five calendar years.

- (e) (0.5 points) Describe the SAO reporting required of the AA in this scenario.

ANSWER:

- (f) (0.5 points) Describe the Annual Statement reporting required of the Company in this scenario.

ANSWER:

Six months after issuance of all actuarial documentation, an examination by the department of insurance noted an error in the Company's paid losses as reported in Schedule P of the Annual Statement.

- (g) (1 point) Describe what is required of the AA after being informed of the error.

ANSWER:

18.

(5 points) The following calendar year 2021 statutory accounting information is provided for a U.S. general insurer. Amounts in the table are in millions of dollars and are before tax.

Net underwriting gain	16.0
Net investment income earned	55.0
Realized capital gains	22.0
Change in unrealized capital gains	10.0
Schedule F provision increase	6.5
Net gain (loss) from agents' balances charged off	(3.2)
Finance and service charges not included in premiums	1.5
Change in intangible assets	2.0
Change in deferred tax assets (DTAs) from revenue offset	0.8
Change in DTAs from IRS loss reserve discounting	2.4

On Dec. 31, 2021, the following company transactions occur that are not reflected in the table above:

- Issuance of two million shares of common stock with a par value of \$1.50 per share and a sale price of \$2 per share.
- Payment of \$0.25 million in policyholder dividends.
- Payment of \$1.75 million in stockholder dividends.

Assume a flat corporate income tax rate of 21%.

Calculate the following Statement of Income amounts for the company's 2021 statutory Annual Statement.

- (0.5 points) Net investment gain (Line 11)
- (0.5 points) Total other income (Line 15)
- (1 point) Net income (Line 20)
- (0.5 points) Capital changes: Paid in (Line 32.1)
- (0.5 points) Surplus adjustments: Paid in (Line 33.1)
- (2 points) Change in surplus as regards policyholders (Line 38)

Provide the response for this question in the Excel spreadsheet.

19.

(6 points) Compare the level of government provision of insurance between the United States and Canada for the following lines of business:

- (i) Workers compensation
- (ii) Automobile insurance
- (iii) Homeowners insurance
- (iv) Agriculture insurance

ANSWER: (i) (ii) (iii) (iv)

****END OF EXAMINATION****