

Exam GIFREU

Date: Thursday, April 29, 2021

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 20 questions numbered 1 through 20 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 time 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)

- (a) (0.5 points) State the purpose of the NAIC Codification project.

ANSWER:

- (b) (0.5 points) Describe how the NAIC Codification project affects the analyses conducted by insurance departments.

ANSWER:

- (c) (2 points) Compare U.S. GAAP accounting to U.S. statutory accounting with respect to each of the following:

- (i) Focus of accounting rules
- (ii) Assets
- (iii) Expenses
- (iv) Loss reserves

ANSWER:

The NAIC Accounting Practices and Procedures Manual (APPM) Preamble addresses the issue of materiality.

- (d) (2 points) Describe three examples of materiality judgements as provided in the APPM Preamble.

ANSWER:

2.

(4 points)

(a) (2 points) Explain how the following aspects of tort law contribute to a perception that the U.S. is an extremely litigious society.

- (i) Use of jury trials
- (ii) Rules of discovery

ANSWER:

Canadian tort law is perceived as being strongly influenced by U.S. tort law.

(b) (2 points) Compare Canadian tort law to U.S. tort law for each of the following aspects of tort law.

- (i) Use of jury trials
- (ii) Rules of discovery

ANSWER:

3.

(5 points) In the U.S., regulation of insurance companies and the business of insurance is primarily a state function. However, the state regulators do not act with complete freedom.

- (a) (1.5 points) Describe three circumstances where the U.S. Constitution can void state laws and regulations.

ANSWER:

The McCarran-Ferguson Act clarified that states have primary regulatory authority over the business of insurance. However, the McCarran-Ferguson Act did not clearly define what activities constitute the business of insurance. The 1979 U.S. Supreme Court decision *Group Life and Health Insurance Co. v. Royal Drug Co.* is used to determine whether an activity constitutes the business of insurance.

- (b) (1.5 points) Describe the three criteria set out by this Supreme Court decision.

ANSWER:

The McCarran-Ferguson Act allows the federal government to become involved in the regulation of the business of insurance if states are not regulating certain areas or if federal legislation applies specifically to insurance. Such federal involvement is illustrated by the Risk Retention Act (RRA).

- (c) (0.5 points) Identify the crisis that prompted Congress to enact the RRA.

ANSWER:

A federal task force investigated the causes of this crisis.

- (d) (0.5 points) Identify two of the factors that caused this crisis as reported by the task force.

ANSWER:

- (e) (1 point) Describe how the RRA affected the business of general insurance.

ANSWER:

4.

(5 points) You are given the following catastrophe loss modeling results for a general insurer domiciled in the U.S.:

Basis	Return Period (1/x years)	Catastrophe Loss (\$000)					
		Earthquake		Hurricane		Terrorism	
		Internal Model	EQECAT Model	Internal Model	RMS Model	Internal Model	AIR Model
Gross of Reinsurance	1/100	158	175	105	700	15	25
	1/200	214	238	143	950	38	45
	1/500	270	300	180	1,200	55	100
Net of Reinsurance	1/100	17	19	11	75	5	6
	1/200	28	30	19	125	10	12
	1/500	54	60	36	240	15	38

- EQECAT, RMS and AIR are commercially available catastrophe models.
- The insurer’s internal catastrophe models have not been reviewed by its domiciliary insurance regulator.

(a) (2 points) Calculate the NAIC RBC catastrophe risk for this general insurer.

Provide the response for this part in the Excel spreadsheet.

The NAIC RBC filing for a company must include explanations for a number of assumptions relating to their modeling of catastrophe losses.

(b) (0.5 points) Identify two assumptions requiring mandatory explanations.

ANSWER:

(c) (1 point) Explain how double counting of catastrophe risk is avoided in the overall NAIC RBC formula.

ANSWER:

4. Continued

The standard formula for the Solvency Capital Requirement (SCR) under Solvency II also includes a charge for catastrophe risks.

- (d) *(1.5 points)* Compare the catastrophe risk charge included in the Solvency II SCR to that in the NAIC RBC formula with respect to each of the following:
- (i) Return period used for catastrophe loss modeling
 - (ii) Natural catastrophe risks included in the formula
 - (iii) Man-made catastrophe risks included in the formula
 - (iv) Correlations between catastrophe risks included in the formula

ANSWER:

5.

(6 points)

- (a) (1.5 points) Describe four Statement of Actuarial Opinion (SAO) disclosures related to rendering a Qualified Opinion for a U.S. general insurance company.

ANSWER:

An actuary's analysis of unpaid claims may result in a point estimate, a range of reasonable estimates, or both.

- (b) (1 point) Describe the U. S. statutory requirements for reporting each of these estimates in the following documents:

- (i) Actuarial Report
- (ii) Actuarial Opinion Summary (AOS)

ANSWER:

- (c) (1 point) Explain why the Appointed Actuary's estimate of unpaid claims is not included in a U.S. SAO.

ANSWER:

In a U.S. SAO, the Appointed Actuary must state that he or she has reviewed the data for reasonableness.

- (d) (1 point) Describe a data review as defined in Actuarial Standard of Practice (ASOP) 23, *Data Quality*.

ANSWER:

U.S. statutory accounting includes rules on the reporting of financial reinsurance in the NAIC Annual Statement.

- (e) (1 point) Describe the reporting of ceded financial reinsurance in the Annual Statement with respect to underwriting income and loss reserves.

ANSWER:

5. Continued

A significant portion of the legal defense costs in pollution cases relate to attorney fees for declaratory judgement (DJ) actions. A DJ is a legal determination made by the court to resolve a legal uncertainty.

- (f) (0.5 points) Describe how DJ legal fees are reflected in Schedule P of the NAIC Annual Statement.

ANSWER:

6.

(4 points) The Board of Directors for BCD General Insurance, a U.S. general insurer, decided to replace its Appointed Actuary (AA) for the upcoming Statement of Actuarial Opinion (SAO).

BCD management had a material disagreement with the former AA on matters regarding the Risk of Material Adverse Deviation (RMAD) disclosure in the prior opinion. This disagreement was resolved with the former AA for the prior opinion. The former AA did not include the wording for the RMAD disclosure that was the cause of the disagreement. There were no unresolved material disagreements with the former AA.

Both the former AA and the replacement AA are independent consultants.

The NAIC instructions to the SAO outline the reporting responsibilities for insurance company boards when replacing the AA.

Outline these responsibilities, in chronological order, for BCD's board in this scenario.

ANSWER:

7.

(5 points)

- (a) (1 point) Identify two reinsurance characteristics that make its accounting complex for the primary insurer.

ANSWER:

- (b) (1.5 points) Describe the difference in claims reporting between assumed reinsurance and primary insurance in terms of each of the following:

- (i) Timing
- (ii) Lines of business
- (iii) Loss Adjustment Expenses (LAE)

ANSWER:

- (c) (2.5 points) Explain how each of the following reinsurance contract provisions shift underwriting risk back to the primary insurer.

- (i) Experience Refunds
- (ii) Cancellation Provisions
- (iii) Combination provisions
- (iv) Payment Schedules

ANSWER:

8.

(5 points) The island country of Catlandia is exposed to floods, earthquakes, and hurricanes. Homeowners insurance policies in Catlandia were provided by private insurers and they did not include coverage for these risks.

The Catlandian government was concerned about this as it did not want its residents to rely on government disaster assistance after a natural catastrophe. It passed legislation making it mandatory for homeowners to insure their property with a standard homeowners' policy. Furthermore, it mandated that all insurers offering homeowners insurance policies in Catlandia must offer an optional natural catastrophe endorsement that includes coverage for losses from floods, earthquakes, and hurricanes.

After these measures were taken by the Catlandian government, some insurers left the market while those remaining in the market increased their rates significantly. To address these issues, the Catlandian government is considering several options.

Critique each of the following options being considered by the Catlandian government:

- (i) Form a government-owned insurance company offering homeowners insurance policies to all homeowners at a uniform actuarially indicated rate per 1,000 of total insured value. This policy would include coverage for losses from natural catastrophes. This insurance would be in competition with private insurance.

ANSWER:

- (ii) Form a government-owned reinsurance company which would reinsure 100% of the optional natural catastrophe endorsement for all private insurance companies writing this coverage. Primary rates for the optional natural catastrophe endorsement are to be mandated by the government and set at a uniform actuarially indicated rate per 1,000 of total insured value.

ANSWER:

- (iii) Form a government-owned reinsurance company providing aggregate excess catastrophe reinsurance to private insurers for homeowners coverage. The reinsurance rates would be at least 20% below market value reinsurance.

ANSWER:

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

9.

(6 points) You are reviewing the calculation of the Net Written Premium (NWP) risk charge included in R-Dan's NAIC RBC requirement for 2018.

You are given the NAIC RBC Basic NWP charge (in \$000), by line of business, for inclusion in R-Dan's 2018 NAIC RBC calculation as follows:

Homeowners / Farmowners (H/F)	Private Passenger Auto Liability/ Medical (PPA)	Commercial Auto Liability (CAL)	Auto Physical Damage (APD)	Special Property (SP)
24,883	32,212	23	0	74

- (a) (3 points) Demonstrate that the NAIC RBC Basic NWP charge for PPA was correctly calculated.

Provide the response for this part in the Excel spreadsheet.

- (b) (1.5 points) Calculate R-Dan's NAIC RBC NWP risk charge before the addition of the excess growth charge.

Provide the response for this part in the Excel spreadsheet.

You are given the following 3-year written premium growth rates for R-Dan:

	H/F	PPA	CAL	APD	SP
Gross	24.8%	4.8%	10.1%	6.5%	0.0%
Net	23.8%	4.2%	10.0%	6.1%	0.0%

- (c) (1.5 points) Calculate R-Dan's NAIC RBC NWP risk charge, R5.

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.*

10.

(5 points) R-Dan management contends that it had strengthened its case reserves in 2017 and 2018 with a focus on claims occurring on or after January 1, 2013 for the Private Passenger Auto Liability/Medical (PPA) line of business:

Assume a claims severity trend of 0% for PPA, which is consistent with that for the industry.

- (a) (2.5 points) Develop a table of data to assess R-Dan management's contention that it strengthened case reserves for PPA.

Provide the response for this part in the Excel spreadsheet.

- (b) (2.5 points) Assess R-Dan's contention that it strengthened case reserves for PPA.

ANSWER:

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

11.

(7 points) Some members of R-Dan's management team were concerned that the company has been booking the low end of Sue Calvin's range for net reserves over the past few years. They believed that R-Dan should be booking net reserves that are closer to Sue Calvin's estimated net reserves of \$318 million at year-end 2018.

- (a) (0.5 points) Provide an argument supporting booked net reserves of \$289.5 million for R-Dan's 2018 Annual Statement.

ANSWER:

Sue Calvin's estimated net reserves were as follows:

	12/31/2018 Net Reserves by Accident Year (\$ millions)					
Total	2018	2017	2016	2015	2014	Prior
318	188	67	33	16	7	7

R-Dan's 2018 NAIC IRIS reserve ratios were as follows:

Ratio 11 1-year development	Ratio 12 2-year development	Ratio 13 Estimated Current Reserve Deficiency
17.3%	19.7%	16.0%

R-Dan management wants to test the sensitivity of these results under an alternative selection of booked reserves for 2018 financial reporting.

- (b) (4 points) Recalculate R-Dan's 2018 NAIC IRIS Ratios 11, 12 and 13 using Sue Calvin's point estimate for year-end 2018 only.

Provide the response for this part in the Excel spreadsheet.

11. Continued

- (c) (1.5 points) Assess the implications on R-Dan's IRIS ratios of using Sue Calvin's point estimate.

ANSWER:

- (d) (1 point) Assess the broader implications of using Sue Calvin's point estimate.

ANSWER:

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

12.

(5 points) You are given the following information for R-Dan's homeowners (HO) line of business that was used in the completion of the 2018 Insurance Expense Exhibit (IEE):

Annual Statement Item (amounts in millions)	2017	2018
Net unpaid losses	24.9	29.3
Net unpaid loss adjustment expenses for Defense and Cost Containment (DCC)	1.4	1.6
Net unpaid loss adjustment expenses for Adjusting and Other (AO)	4.7	5.2
Net unearned premium reserve	81.8	98.7
Net premiums written	149.6	184.1
Net premiums earned	131.9	167.2
Agents' balances	14.7	16.7

You have been informed that R-Dan's policyholders' surplus (PHS) for 2018 was overstated in its statutory Annual Statement by \$20 million. This overstatement was due to amounts owed to others that were not recorded but should have been recorded in *aggregate write-in for liabilities*.

Determine the following items for R-Dan's 2018 IEE using the corrected amount for the 2018 PHS:

- (i) (1 point) Prepaid expense ratio for HO
- (ii) (2 points) Investment gain ratio
- (iii) (2 points) Investment gain on funds attributable to insurance transactions for HO

Provide the response in the Excel spreadsheet.

13.

(6 points) Within each state, an agency commonly known as the Department of Insurance (DOI) regulates insurer operations.

- (a) (1 point) Describe four regulatory insurance functions that every state DOI regularly performs.

ANSWER:

DOIs are created by state legislatures to administer state insurance laws and adopt insurance regulations.

- (b) (2.5 points) Describe five ways that state legislatures can influence insurance regulation carried out by DOIs in each state.

ANSWER:

DOIs are assisted by the National Association of Insurance Commissioners (NAIC). One way that the NAIC assists DOIs is through the DOI accreditation program.

- (c) (1 point) Describe four ways in which the NAIC assists DOIs in the conduct of their insurance regulatory function, other than through the DOI accreditation programs.

ANSWER:

- (d) (1 point) Identify four activities that are part of the NAIC DOI accreditation review.

ANSWER:

- (e) (0.5 points) Identify two key standards that state DOIs must meet in order to receive accreditation.

ANSWER:

14.

(6 points) In a majority of countries, the legal system falls into one of two major categories: the common-law system or the civil law system.

- (a) (1.5 points) Contrast these two legal systems with respect to the following:
- (i) Framework for legal decisions
 - (ii) Role of the judge

ANSWER:

WXY is a successful and well-capitalized general insurance company domiciled in the United States. WXY's board of directors recently authorized the company's CEO to explore expanding operations internationally. The company is considering direct foreign investment by creating a wholly-owned foreign general insurance subsidiary in Country B. Country B has a civil law legal system.

- (b) (1.5 points) Describe three potential motivations for a company to operate internationally.

ANSWER:

Operating internationally may result in additional financial risks.

- (c) (2 points) Describe four potential financial risks from operating internationally.

ANSWER:

- (d) (1 point) Describe a concern with this investment, from the perspective of WXY's actuarial department, that does not relate to these additional financial risks.

ANSWER:

15.

(3 points) U.S. statutory accounting distinguishes secured from unsecured receivables.

- (a) (0.5 points) State two approaches for securing premium receivables.

ANSWER:

- (b) (0.5 points) Identify the section of the NAIC annual statement where each approach for securing premium receivables from part (a) is reported.

ANSWER:

- (c) (0.5 points) Describe the statutory treatment of secured premium receivables.

ANSWER:

- (d) (0.5 points) Describe the statutory treatment of unsecured premium receivables not yet due.

ANSWER:

- (e) (1 point) Explain why earned but unbilled (EBUB) premium and accrued retrospective premium (ARP) arise in commercial general insurance.

ANSWER:

16.

(5 points)

- (a) (2 points) Provide the following information based upon the NAIC Own Risk and Solvency Assessment (ORSA) Guidance Manual:
- (i) Definition of ORSA
 - (ii) Two primary goals of ORSA

ANSWER:

You are the pricing actuary for QRS General Insurance Company. QRS's senior management has decided to begin writing workers compensation coverage in multiple states.

Based on your research of this coverage, you discovered that several states have put forward proposals for significant regulation changes affecting workers compensation. These proposals would materially increase the cost of coverage over the time period that QRS will begin writing this coverage.

You have been asked to summarize the implications of QRS's decision to expand into workers compensation. This summary is to address at least three of the five key principles of an effective ERM framework as stated in the NAIC ORSA Guidance Manual. Your summary should inform management as to how this decision follows or does not follow an effective ERM framework.

- (b) (3 points) Construct this summary addressing three of the five key principles.

ANSWER:

17.

(4 points)

- (a) (1 point) Describe a situation in which an Appointed Actuary may render each of the following types of Opinions in the U.S. Statement of Actuarial Opinion (SAO):
- (i) Qualified
 - (ii) No opinion

ANSWER:

You are the Appointed Actuary for ABC General Insurance Company (ABC) domiciled in the state of Ohio. ABC carries 116 million on a gross basis and 36 million on a net basis. You have reached the following conclusions based on your analysis of unpaid loss and loss adjustment expenses as of December 31, 2020:

- Gross point estimate of 100 million with a reasonable range from 93 to 110 million
- Net point estimate of 40 million with a reasonable range from 38 to 43 million

- (b) (2.5 points) Prepare parts A through C of the Opinion section of the SAO.

ANSWER:

- (c) (0.5 points) Identify one risk factor to mention as a company-specific risk factor in the *Relevant Comments* section of the SAO.

ANSWER:

18.

(5 points) Casualty insurers may purchase an annuity from a life insurer to fund structured settlement payments to claimants. Structured settlements funded by an annuity function similarly to an insurer retroactively reinsuring its unpaid claims.

(a) (1.5 points) Contrast the reporting of reserves under U.S. statutory accounting for the two claims below, including a key reason for the difference.

(i) a claim that includes a structured settlement funded by an annuity

(ii) a claim that includes retroactive reinsurance

ANSWER:

GCIC, a U.S. general insurer, has \$50 million in statutory surplus as of Dec. 31, 2020. GCIC has arranged structured settlements for several of its liability insurance claims by purchasing annuities. You are tasked with constructing GCIC's required disclosures for Note 27 in the Notes to Financial Statements of its statutory Annual Statement as of Dec. 31, 2020. The following table outlines key information with respect to GCIC's annuity-funded structured settlements:

Annuity	Statutory Value of Annuity at Purchase Date (\$000)	Statutory Value of Annuity at Dec. 31, 2020 (\$000)	Annuity Payer (life insurance company)	Annuity Payer Financial Rating	Annuity Payee
A	850	750	UPL	A+	Claimant
B	650	600	GRL	A-	GCIC
C	350	300	GRL	A-	Claimant
D	400	400	BLL	A	GCIC
E	500	450	BLL	A	Claimant
F	700	550	CTL	B	GCIC
G	300	250	CTL	B	Claimant
H	800	700	DEL	B+	Claimant
I	150	150	DEL	B+	GCIC

- GCIC obtains a release of liability from the claimant whenever the annuity payer is financially rated A or higher and the annuity payee is the claimant.
- GRL is an affiliate of GCIC.
- GRL and DEL are licensed in GCIC's state of domicile.
- BLL, CTL, and UPL are not licensed in GCIC's state of domicile.

18. Continued

- (b) (1.5 points) Calculate the two amounts that GCIC must report in Note 27 Part A.

Provide the response for this part in the Excel spreadsheet.

- (c) (2 points) Construct GCIC's required disclosures for Note 27 (Parts A and B).

Provide the response for this part in the Excel spreadsheet.

19.

(5 points)

- (a) (2 points) Describe four common characteristics of workers compensation (WC) programs found in most industrialized countries.

ANSWER:

WC programs are often considered to be a form of social insurance.

- (b) (1 point) Describe two features of WC programs that make them an example of social insurance.

ANSWER:

A perennial problem faced by many U.S. employers is that increases in employer-paid WC rates are sometimes excessive.

- (c) (2 points) Describe four factors that have been identified as generating (or potentially generating) upward pressure on WC rates in the United States.

ANSWER:

20.

(4 points) The asbestos mass tort has had a significant financial effect on the general insurance industry. One reason for this was the court's interpretation of which insurance coverage applied regarding liability for asbestos exposure.

- (a) (2 points) Explain how the court's interpretation of insurance coverage increased the cost to the insurance industry.

ANSWER:

Johns-Manville Corporation (Manville) was the largest manufacturer of asbestos and supplier of products with asbestos in the United States. In 1982, Manville filed for Chapter 11 bankruptcy which included establishment of a trust fund to pay for claims from those harmed by asbestos.

Ordinarily, bankruptcy usually results in a resolution to a mass tort. However, this was not the case after Manville's bankruptcy.

- (b) (2 points) Explain why the Manville bankruptcy did not reduce asbestos litigation in the United States.

ANSWER:

****END OF EXAMINATION****