



GI 201
Operational,
Financial,
Regulatory and Legal
Study Manual

1st Edition

Yanlin Shi, PhD FSA FIAA CERA CStat FHEA



An SOA Exam



Actuarial & Financial Risk Resource Materials
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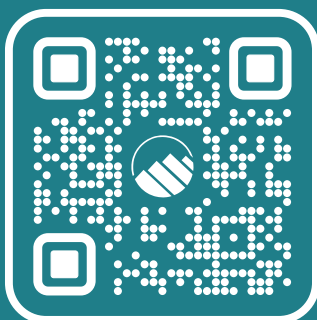
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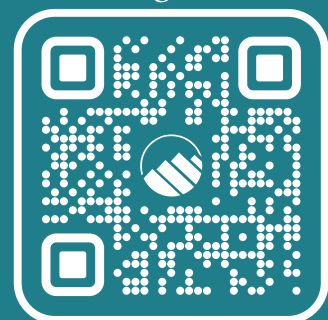
Formula Sheets



Actuarial Exam Tactics



The Actuarial Career:
Getting Started



Contents

I	General Insurance Company Operations	1
1	General Insurance Company Operations	3
§1a	Introduction	3
§1b	Overview of GI Companies	4
§1c	Production	4
§1d	Pricing Function	5
§1e	Underwriting Function	5
§1f	Claim Function	6
§1g	Reinsurance	7
§1h	Risk Management	8
§1i	Premium Audit	8
§1j	Conclusion	8
	Practice questions	9
	Solutions to practice questions	10
2	FGIAA Chapter 29 Manual Rating	11
§2a	Introduction	11
§2b	Manual Rating	11
§2c	The Rating Manual	11
§2d	Rating Rules	11
§2e	Rating Algorithm	12
§2f	Rate Pages	12
	Practice questions	13
	Solutions to practice questions	14
3	IAA Risk Book: Non-Life Perils and Coverages (part 1)	15
§3a	Categories of Risks	15
§3b	Insurability of Non-Life Perils	15
§3c	Types of Non-Life Insurance	16
§3d	Characteristics of Non-Life Insurance	16
§3e	The Non-Life Insurance Contract	17
§3f	Other Issues	17
	Practice questions	18
	Solutions to practice questions	19
II	Regulatory Environment	21
4	The General Insurance Regulatory Environment	23
§4a	Introduction	23
§4b	Authority of Insurance Regulation	23
§4c	Regulation for the Social Good	23
§4d	Influences on Insurance Regulation	24
§4e	The Department of Insurance	24
§4f	Insurance Regulation Through Licensing	24
§4g	Regulation of Insurer Activities	25
§4h	Additional Regulatory Activities for Insurance	26

§4i	Solvency and Insolvency Regulation	27
§4j	Conclusion	28
	Practice questions	29
	Solutions to practice questions	30
5	FGIAA Chapter 28 Rate Regulation	31
§5a	Objectives of GI Rate Regulation	31
§5b	The Rate Regulation Continuum & Description of Rate Regulatory Approaches	31
	Practice questions	33
	Solutions to practice questions	34
6	IAA Risk Book: Non-Life Perils and Coverages (part 2)	35
§6a	Residual Markets	35
§6b	Government Insurance Programs	35
§6c	Underwriting Requirements	36
§6d	Rate and Policy Form Regulation	36
§6e	Changes in Rate Making	36
	Practice questions	37
	Solutions to practice questions	38
7	Insurance and the discrimination laws: motor and travel insurance	39
§7a	Summary	39
	Practice questions	40
	Solutions to practice questions	41
8	Usage Based Insurance and Telematics	43
§8a	Background	43
§8b	Telematics	43
§8c	Issues	46
§8d	The road ahead	48
	Practice questions	49
	Solutions to practice questions	51
9	Government Provision of General Insurance	53
§9a	Introduction	53
§9b	Reasons for government provision of insurance	53
§9c	Agricultural insurance	55
§9d	Automobile insurance	57
§9e	Property insurance	58
§9f	Worker compensation (WC)	61
§9g	Residual markets	63
§9h	Appendix: no-fault insurance	65
	Practice questions	67
	Solutions to practice questions	70
10	Private Flood Insurance and the National Flood Insurance Program	75
§10a	Introduction	76
§10b	Background	76
§10c	Objectives of the NFIP	76
§10d	Primary Flood Insurance Through the NFIP	76
§10e	NFIP Reauthorization and Legislation	77
§10f	Role of Private Insurers in the NFIP	77
§10g	Private Flood Market: Issues and Barriers	77
§10h	Potential Effects of Increased Private Sector Involvement	78
§10i	Concluding Comments	79
	Practice questions	80
	Solutions to practice questions	81

11	Use of Credit Scores by Insurers	83
§11a	Credit-based insurance scores	83
§11b	Current regulatory framework	84
§11c	Potential risks to consumers	85
	Practice questions	87
	Solutions to practice questions	88
12	Price Optimization White Paper	91
§12a	Price Optimization Background	91
§12b	Potential Benefits and Drawbacks of Price Optimization	92
§12c	Regulatory Responses to Price Optimized Rating Schemes	92
§12d	Recommendations for Regulators	92
	Practice questions	94
	Solutions to practice questions	95
13	Captive Insurance	97
§13a	Background	97
§13b	Captive domiciles	97
§13c	Alternative risk transfer (ART) and types of captives	98
§13d	Reasons for captives	98
§13e	Regulatory environment	100
§13f	Insurer-owned captives	101
§13g	RRG	101
	Practice questions	102
	Solutions to practice questions	103
14	IAA Risk Book: Reinsurance	105
§14a	Introduction	105
§14b	Categories of Reinsurance	105
§14c	Types of Proportional/Non-Proportional Reinsurance	106
§14d	Effects of Non-proportional Reinsurance	106
§14e	Intra-group Reinsurance Transactions	106
§14f	Capital Effects of Reinsurance	106
§14g	Reinsurance and Regulation	107
§14h	Complementary Risk Mitigation Instruments	107
	Practice questions	109
	Solutions to practice questions	110
III	Legal Environment	111
15	Excerpts from Business Law for Insurance Professionals: Contract Law, Insurance Applications	113
§15a	Special characteristics of insurance contracts	113
§15b	Insurance contract formation	114
§15c	Insurance as 3rd party beneficiary contract	115
§15d	Representations and warranties in insurance	116
§15e	Waiver, estoppel, election	117
§15f	Nonwaiver agreements and reservation of rights letters	118
	Practice questions	119
	Solutions to practice questions	121
16	Excerpts from Business Law for Insurance Professionals: Tort Law	125
§16a	Negligence	125
§16b	Defenses against negligence claims	126
§16c	Liability of landowners or occupiers of land	127
§16d	Intentional torts	128
§16e	Liability in extraordinary circumstances	133

§16f	Products liability	133
§16g	Damages in tort suits	135
§16h	Liability concepts affecting tort claims	135
	Practice questions	137
	Solutions to practice questions	139
17	Excerpts from Business Law for Insurance Professionals: The international Legal Environment	143
§17a	Legal systems	143
§17b	International law	144
§17c	Multinational organizations and agreements	144
§17d	US laws affecting international business	144
§17e	Financial considerations in international business	144
§17f	Non-legal factors affecting international business	146
	Practice questions	147
	Solutions to practice questions	148
18	Tort Law – Topics for General Insurance Actuaries	149
§18a	Introduction	149
§18b	Tort cost trends	149
§18c	Tort reform	151
§18d	Mass torts and toxic torts	153
§18e	Important cases in US affecting GI	157
§18f	Influence of US tort law abroad	160
	Practice questions	165
	Solutions to practice questions	172
19	Social Inflation: Navigating the Evolving Claims Environment	183
§19a	What Is Social Inflation?	183
§19b	Underlying Drivers of Social Inflation	184
§19c	How Insurers Can Respond	184
§19d	Concluding Remarks	185
	Practice questions	186
	Solutions to practice questions	187
IV	Financial Economics	189
20	Behavioral Finance	191
§20a	Introduction	191
§20b	Cognitive Biases	191
§20c	Limits to Arbitrage	192
	Practice questions	194
	Solutions to practice questions	195
21	Asset-Liability Management in General Insurance	197
§21a	Introduction	197
§21b	A Comparison of ALM in Life and General Insurance	197
§21c	ALM Strategies for General Insurers	198
§21d	Appendix – Duration Gap of Surplus	199
	Practice questions	200
	Solutions to practice questions	201
22	Ratemaking: A Financial Economics Approach	203
§22a	Introduction to Financial Economics	203
§22b	Target Total Rate of Return (TRR) Model	203
§22c	Application of CAPM to Insurance	205
§22d	Discounted Cash-Flow (DCF) Models Applied to Insurance	207

Solutions to practice questions	212
---	-----

V Financial Reporting 213

23 IAA Risk Book: Liabilities for General Insurance 215

§23a Overview	215
§23b Life vs. General Insurance Differences	215
§23c Pre-claim Liabilities	215
§23d Claim Liabilities	216
§23e Ceded Reinsurance	217
§23f Other Liability Offsets	217
§23g Premium Receivables	217
§23h Miscellaneous Liabilities	217
§23i Industry Segment Considerations	217
Practice questions	218
Solutions to practice questions	219

24 GIFRT Ch1: Accounting Concepts for General Insurance 221

§24a Introduction	221
§24b Accounting systems	222
§24c Double-entry bookkeeping	223
§24d BS and IS	224
§24e Accrual accounting	227
§24f CY, policy year (PY) and AY accounting	228
§24g Computations of equity	232
Practice questions	234
Solutions to practice questions	235

25 GIFRT Ch2: Accounting for Insurance Contracts 237

§25a Introduction	237
§25b Premiums	237
§25c Underwriting and acquisition expenses	240
§25d Reinsurance recoverables	244
§25e PH dividends	245
§25f Accounting for income taxes	245
§25g Premium liabilities and premium deficiency reserves (PDR)	246
§25h IFRS 17–Accounting for insurance contracts	246
Practice questions	254
Solutions to practice questions	256

26 FGIAA Chapter 24 Claim Liabilities 259

§26a Introduction	259
§26b Estimates of Unpaid Claims	259
§26c Reserves for Financial Reporting	260
§26d Claim Liabilities for Auto Insurer	261
Practice questions	263
Solutions to practice questions	264

27 GIFRT Ch3: Accounting for Financial Instruments 267

§27a Introduction	267
§27b Valuation of financial instruments	267
§27c Bonds	269
§27d Common stocks	277
§27e Real estate	278
Practice questions	280
Solutions to practice questions	281

28	GIFRT Ch4: Accounting for reinsurance contracts	283
§28a	Introduction	283
§28b	Reporting of reinsurance versus primary insurance	284
§28c	Reinsurance accounting entries	284
§28d	Reinsurance accounting and transfer of underwriting risks	285
§28e	Deposit accounting for reinsurance	288
§28f	Prospective versus retroactive reinsurance	291
§28g	Novations	293
§28h	Reinsurance commutations	293
	Practice questions	298
	Solutions to practice questions	303
VI	Financial Health Measurement	309
29	Performance measurement for general insurers	311
§29a	Introduction	311
§29b	Income measurement	312
§29c	Retrospective vs prospective measurement	313
§29d	Allocation of Equity	315
§29e	Income tax liability allocation	318
§29f	Investment income allocation	319
§29g	RAROC and RBC	319
§29h	Capital requirements	322
	Practice questions <i>[Note: some SOA past exams may be out of the scope of current syllabus]</i> . . .	324
	Solutions to practice questions	327
30	Measuring Insurer Financial Strength	331
§30a	Introduction	331
§30b	Financial ratio analysis	331
§30c	Features of effective financial ratios	333
§30d	Insurance supervision and financial ratios	334
§30e	Profitability ratios and performance management	335
§30f	Liquidity ratios	336
§30g	Investment yields	337
	Practice questions	339
	Solutions to practice questions	345
31	Solvency Monitoring	353
§31a	Introduction	353
§31b	Solvency monitoring background	353
§31c	Solvency monitoring (SM) objectives	354
§31d	Basis for capital requirements	359
§31e	Fixed formula capital risk charges	361
§31f	Underwriting risk charges	362
§31g	Catastrophe risk charges	365
§31h	Accounting margins	367
§31i	ORSA reporting	368
§31j	Appendix B: Solvency II standard formula	369
	Practice questions	374
	Solutions to practice questions	381
32	IAA Risk Book: Own Risk and Solvency Assessment	389
§32a	Introduction	389
§32b	The ORSA Process	389
§32c	Conducting an ORSA	390
§32d	Integration with Business Processes	390
§32e	Group and Supervisory Considerations	391

§32f The Role of Actuaries	391
§32g Recent Developments: Climate Change Risks	391
Practice questions	392
Solutions to practice questions	393
33 NAIC ORSA Guidance Manual	395
§33a Introduction	395
§33b Section 1: description of insurer's ERM framework	397
§33c Section 2: insurer assessment of risk exposures	398
§33d Section 3: group assessment of risk capital and prospective solvency assessment	398
Practice questions	402
Solutions to practice questions	403
34 Deriving Value from ORSA – A Board Perspective	405
§34a Preface	405
§34b Introduction	405
§34c Understanding the Company's Risk Appetite and Risk Profile	405
§34d Assessing the Adequacy of Risk Evaluation and Treatment Processes	406
§34e Understanding Management's Strategic Risk-Based Decisions	407
§34f Limitations and Caveats	407
Practice questions	408
Solutions to practice questions	409
35 General Insurance Financial Ratings	411
§35a Introduction	411
§35b Benefit to PH	411
§35c Prevalence of ratings for GI	412
§35d Rating process	412
§35e Rating agency capital standards	414
Practice questions	419
Solutions to practice questions	423
VII Responsibility of the Actuary	429
36 IAA Risk Book: Professional Standards	431
§36a Executive Summary	431
§36b Key Messages	431
§36c Background	431
§36d Benefits of Actuarial Standards	432
§36e Standard-Setters and Regulators	432
§36f Local and IAA Model Standards	432
§36g Enforcement of Standards	433
§36h Conclusion	433
Practice questions	434
Solutions to practice questions	435
37 International Standard of Actuarial Practice 1, General Actuarial Practice	437
§37a General	437
§37b Appropriate practices	438
§37c Communication	442
Practice questions	444
Solutions to practice questions	445
38 International Standard of Actuarial Practice 4, IFRS 17 Insurance Contracts	447
§38a Preface	447
§38b Introduction	447
§38c General	447

§38d Appropriate Practices	448
§38e Communication	450
Practice questions	451
Solutions to practice questions	452
39 General Insurance Actuarial Opinion	453
§39a Introduction	453
§39b Appointed Actuary and actuarial report	453
§39c Appendix A: the role of Appointed Actuary	458
Practice questions	459
Solutions to practice questions	460
40 IAA Risk Book: Materiality, Proportionality and Similar concepts	461
§40a Introduction	461
§40b Proportionality	461
§40c Materiality	462
§40d Cost-Benefit Analysis	462
§40e Risk-Focused (Risk-Based) Approach	462
§40f Common Threads	463
§40g Concluding Comments	463
Practice questions	464
Solutions to practice questions	465
41 Practice Exam	467
Questions	467
Solutions	472

NOTES

This study manual is written with the purpose of assisting the candidates for the SOA exam GI 201 Operational, Financial, Regulatory and Legal. In most cases, the readings covered in this manual is in the order as they appear in the syllabus.

Relevant practice questions and answers are provided at the end of each reading. Past exam and answers have been taken from SOA's GIFREU (**up to 2020 spring, and relevant question numbers for 2020 fall, 2021 spring/fall and 2022 spring/fall**), which are identified with "(SOA GIFREU Year Spring/Fall Qi)" in the manual. When there is insufficient exercise, past exams and answers of the CAS exam 6US are included. All the past exam questions and answers are copyrighted by the Society of Actuaries and Casualty Actuarial Society. I appreciate the SOA for its permission to use this material. The SOA, however, is in no way responsible for the structure or accuracy of the manual. SOA will publish relevant past exam questions in July 2025, and the mapping for 2023–2025 exams are therefore excluded. Note that for some readings, especially chapters of the SOA textbook *General Insurance Financial Reporting Topics* (GIFRT), past exam questions may cover syllabus of both GI201 and GI302. To maintain the completeness of the questions, they are included in the manual. Readers should be aware that some may be out of the scope of GI201.

The last part consists an original practice exam, with questions based on the required study materials. Many of those questions are inspired by the past SOA GIFREU and CAS exam 6US. Although I have made a conscientious effort to eliminate mistakes in questions and answers, errors may exist. I encourage candidates who find errors to bring them to my attention. You can send your comments to my email address - syl9810@gmail.com. Any other feedback is also warmly welcome.

As a final suggestion, practice is important! Among all the reasons for failures, not taking past exams seriously is the No.1 issue. In addition to my mock exam, candidates are strongly encouraged to at least attempt the relevant past year questions published officially by the SOA to achieve the maximum likelihood of passing.

I would like to thank Stephen Camilli, FSA and the former President of ACTEX Learning, for his insightful comments.

Best of luck with your studies!!!

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Part I

General Insurance Company Operations

Solutions to practice questions

1.
 - Core: Production (sales/marketing), Pricing (ratemaking), Underwriting (risk selection), Claims (handling).
 - Supporting: Accounting & Finance, IT, Investments, Legal, Reinsurance, Risk Management—each ensures smooth operation, compliance and financial stability.
2.
 - Admitted: state-licensed, must file rates/forms, serve standard market—use agents and brokers.
 - Nonadmitted: surplus lines, can write unusual risks without state-filed forms—placed by surplus lines brokers.
3.
 - Loss component: expected loss costs including allocated LAE.
 - Expense loading: ULAE, acquisition, admin expenses, taxes/fees.
 - Profit margin: contingency for profit and capital cost.
 - Reinsurance loading: cost of ceded reinsurance layers.
 - Adjust for competitive positioning and regulatory requirements.
4.
 - Combined ratio = loss ratio + expense ratio; measures underwriting profitability.
 - Operating ratio = combined ratio - investment income ratio; includes investment returns.
5.
 - Ceded % = 30%, thus reinsurer pays $0.30 \times \$200\,000 = \$60\,000$.
 - Primary insurer retains \$140 000.
6.
 - Detecting and deterring insurance fraud.
 - Obtaining updated information for renewal underwriting.

Chapter 2

FGIAA Chapter 29 Manual Rating

Syllabus

1d) Understand the process for pricing general insurance policies.

§2a Introduction

- Two important equations:
 - $\text{Premiums} = \text{claims} + \text{expenses} + \text{profit and contingencies}$
 - $\text{Premiums} = \text{exposures} \times \text{base rate adjusted by rating factors} \times \text{adjustment for individual risk rating}$

§2b Manual Rating

- $\text{Manual premium} = \text{exposures} \times \text{base rate adjusted by rating factors}$
- Base rate reflects the average experience

§2c The Rating Manual

- Contains the assignment of a base rate
- Contains three major categories:
 - Rating rules
 - Rating algorithms
 - Rate pages

§2d Rating Rules

- The base rate:
 - Refers to a unit of cost that will be multiplied by exposure to determine a base premium
 - Represents the average cost (claims, expenses, profit and contingencies) of coverage
 - Is calculated at a specified deductible and policy limit
- The rating factors:

- Reflect the risk characteristics that are relevant to the specific line of business
- The rating rules:
 - Represent the specific characteristics of
 - * the insurance coverage, and
 - * the exposure base used for determining premiums

§2e Rating Algorithm

- The rating algorithm refers to the formula to determine the premium
- May also address loadings to premiums

§2f Rate Pages

- Summarize the base rate(s) and rating factors
- May also contain discounts and surcharges

Practice questions

1. Name the three major categories of the rating manual.
2. State the two important equations for premium calculation.
3. What information do rate pages summarize, and what additional elements may they include?

Solutions to practice questions

1. The three major categories are:
 - Rating rules
 - Rating algorithms
 - Rate pages
2. The two important equations are:
 - $\text{Premiums} = \text{claims} + \text{expenses} + \text{profit and contingencies}$
 - $\text{Premiums} = \text{exposures} \times \text{base rate adjusted by rating factors} \times \text{adjustment for individual risk rating}$
3. Rate pages summarize the base rate(s) and rating factors; they may also contain discounts and surcharges.

Part IV

Financial Economics

Chapter 20

Behavioral Finance

Syllabus

4a) Demonstrate knowledge of behavioral finance

§20a Introduction

- Definition. Behavioral finance studies how real-world psychological biases and market frictions cause deviations from the predictions of classical, fully rational, efficient-market models.
- Two building blocks
 - *Cognitive psychology* – systematic errors in how individuals perceive, process, and use information.
 - *Limits to arbitrage* – practical frictions that stop rational traders from eliminating mispricing.
- Motivation. Traditional finance struggles to explain bubbles such as Japan (late-1980s), Taiwan (1989–90), or the US dot-com boom (1998–2000). Behavioral models help fill this gap.
- Contrast with EMH. The Efficient-Markets Hypothesis allows some investors to be irrational but assumes prices remain unbiased. Behavioral finance relaxes this market-level rationality in selected settings.
- Mispricing categories.
 - *High-frequency, short-lived* – small, often arbitrated away (e.g., bid–ask bounce).
 - *Low-frequency, persistent* – large, long-lasting (e.g., multi-year bubbles) because arbitrage is risky, costly, or impossible.

§20b Cognitive Biases

§20b(i) Heuristics

- Rules of thumb simplify complex decisions but misfire if the environment changes.
- Example: the $1/N$ retirement rule – equal allocation across available funds regardless of true risk profile.

§20b(ii) Overconfidence

- Investors systematically overestimate their forecasting skill and the precision of private information.

- Symptoms
 - Excessive trading (higher turnover, lower net returns).
 - Home, industry, and employer-stock biases leading to poor diversification.
 - Gender effect – empirical evidence shows men trade more and underperform women on average.

§20b(iii) Mental Accounting

- People compartmentalise wealth into separate “accounts” rather than treating it holistically.
- Leads to inconsistent choices: e.g. splurging on restaurant meals while scrimping on groceries, or simultaneously holding high-interest credit-card debt and low-yield savings.

§20b(iv) Framing

- Identical outcomes are valued differently depending on wording or context.
- Example: consumers prefer an “early-bird discount” to an identical “peak-time surcharge.”
- Policy illustration – presenting insurance as a “small premium to avoid a large loss” increases take-up.

§20b(v) Representativeness

- Investors overweight recent or salient information and underweight long-term base rates (“law of small numbers”).
- Drives momentum in bull markets and excessive pessimism after crashes.

§20b(vi) Conservatism

- Opposite of representativeness – slow adjustment to genuine regime shifts because of anchoring on prior beliefs.
- Explains post-earnings-announcement drift: investors underreact to new information, prices adjust gradually.

§20b(vii) Disposition Effect

- Tendency to realise gains quickly and ride losses too long.
- Produces lower trading volume in bear markets as investors defer loss realisation, raising systemic liquidity risk for brokers.

§20c Limits to Arbitrage

- Implementation costs. Short-sale constraints, margin requirements, and transaction fees deter traders from correcting mispricing.
- Model risk. Mispricing may widen before converging, bankrupting the arbitrageur (e.g. Long-Term Capital Management’s Royal Dutch/Shell trade).
- Noise-trader risk. Mispricing generated by irrational traders can persist or intensify unpredictably; rational traders with finite capital cannot bear interim losses indefinitely.
- Funding risk. Capital withdrawals by clients after poor short-run performance force arbitrageurs to liquidate just when opportunities are best (feedback loop that amplifies bubbles).
- Practical categorisation.

- *Recurrent, short-horizon mispricing.* Hedge funds compete away profits; markets appear efficient.
- *Long-horizon, nonrepeating mispricing.* High uncertainty and funding risk render arbitrage ineffective; large bubbles or crashes emerge.

Practice questions

1. Explain how overconfidence affects portfolio diversification and trading volume.
2. Describe the disposition effect and discuss its implications for brokers' revenue over the market cycle.
3. Identify two key limits to arbitrage and illustrate each with an historical example.

Solutions to practice questions

1.
 - Overconfident investors overestimate their stock-picking skill and the precision of private signals.
 - They trade more frequently, incurring higher transaction costs and taxes.
 - They hold concentrated positions in familiar or employer stocks, reducing diversification and risk-adjusted returns.
2.
 - Disposition effect – investors prefer to lock in gains quickly (realising small profits) and defer sales of losing positions.
 - In bull markets: many winners are realised, boosting trading volume and commission income.
 - In bear markets: investors “wait to break even,” volume and brokerage revenue fall sharply.
3.
 - Short-sale constraints. Difficulty and cost of borrowing shares limited arbitrage against tech stocks during the 1999–2000 bubble.
 - Funding (liquidity) risk. Long-Term Capital Management’s Royal Dutch/Shell convergence trade (1998): investor redemptions forced liquidation as mispricing widened, amplifying the divergence.

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Chapter 41

Practice Exam

Note to Candidates: This practice exam follows the format of the past GIFREU exams. The total mark is 50 points, which reflects the new SOA requirement that the contents would be two hours and a half, although the permitted time is three hours. Some questions are inspired by past exams of CAS exam 6US and SOA GIFREU.

When you take the exam, stick to the time limit (three hours) and simulate exam conditions. It is recommended that you spend three minutes for each point. At the end of the recommended time, you should stop answering and move to the next question.

Questions

1. (3 points) Answer the following questions.

(a) (1 point) Define Allocated Loss Adjustment Expenses and Unallocated Loss Adjustment Expenses.

(b) (1 point) An insurer has the following data for the year:

- Losses + LAE incurred: \$80,000
- Earned premium: \$200,000
- Underwriting expenses incurred: \$50,000
- Written premium: \$250,000
- Investment income on insurance funds: \$20,000

Calculate:

(i) The Combined Ratio

(ii) The Operating Ratio

(c) (1 point) Describe two core functions of an insurance company.

2. (7 points) One of the typical government provision in the insurance industry is agriculture insurance.

(a) (2 points) Briefly describe four types of agriculture insurance.

Recently, agricultural risks to be insured against have evolved significantly.

(b) (1.5 points) Identify three significant changes affecting agricultural risks.

Canada has an agricultural insurance system with shared responsibility between federal and provincial governments.

(c) (2 points) Explain four types of Canadian government provisions in the agricultural insurance.

Another important line of business that needs government provision is the health insurance. After the introduction of the Affordable Care Act (ACA) in the US, various tax measures beyond the tax penalty are resulted for the public without health insurance coverage.

- (d) (1.5 points) List three examples of those tax measures.
3. (3 points) An insurer has the following cash-flow profile and uses a flat yield curve of 10
- Assets: \$1 000 paid at the end of years 1, 2 and 3.
 - Liabilities: \$1 500 paid at the end of year 1 and \$1 000 paid at the end of year 2.
- (a) (1 point) Calculate the Market Value of Assets and the Market Value of Liabilities.
- (b) (1 point) Compute the asset duration and the liability duration .
- (c) (1 point) Calculate the duration gap of surplus and state the approximate percentage change in surplus if yields rise by 1%.
4. (3 points) Actuaries often tailor their work using a set of flexibility tools rather than applying a one-size-fits-all approach.
- (a) (1 point) List the four flexibility tools commonly used by actuaries to adjust their level of analysis.
- (b) (1 point) In the context of Solvency II, explain what is meant by proportionality in actuarial work.
- (c) (1 point) Describe how cos-benefit analysis guides an actuary's decision on the scope of work to perform.
5. (4 points) One of the benefits of creating a captive insurer is that it is subject to less regulation than a traditional insurance company.
- (a) (1.5 points) Explain three ways that captive insurers are subject to less regulation than traditional insurance companies. There are also several drawbacks to creating a captive insurer
- (b) (1.5 points) Describe three drawbacks. Various different types of captive insurers have been created.
- (c) (1 point) Define the following types of captive insurers:
- (i) Diversified
 - (ii) Agency-owned
6. (5 points) Answer the following questions:
- (a) (1 point) Explain what is meant by the application of strict liability in a tort case.
- (b) (4 points) Assess the potential for the application of strict liability for each of the following cases:
- (i) ABC Toys manufactures a popular line of stuffed bears with moveable limbs. The limbs of these toys employ the use of thin metal parts. Failure of these parts may cause sharp pieces to break off. This occurred after a small child was chewing on the stuffed bear's arm and one of the sharp pieces caused serious injury to the child. The parents of the child are suing ABC Toys for damages.
 - (ii) The Clark family stores large quantities of chemicals to clean their pool. They have taken reasonable care to ensure the chemicals are stored safely. A lightning strike caused the storage container for these chemicals to fail. The chemicals spilled into the property of their neighbor, the Griswald family. The Griswald family sues the Clark family for damages to their property.
 - (iii) The Alpha family has a small dog which escaped from their yard by digging under the fence. The dog went over to the Beta family's property and chewed all four tires on their vehicle. This was the first time the dog had done anything like this. The Beta family sues the Alpha family for damages.
 - (iv) Beeline Accounting prepares the financial statements for a small business, Baubles, that sells handmade jewelry. A significant error was made in the financial statements which caused Baubles to pay a large tax penalty. Baubles sues Beeline for damages.