SOCIETY OF ACTUARIES
Financial and Regulatory Environment – U.S.

Exam GIFREU

MORNING SESSION

Date: Thursday, October 29, 2015
Time: 8:30 a.m. – 11:45 a.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 100 points. It consists of a morning session (worth 60 points) and an afternoon session (worth 40 points).

   a) The morning session consists of 13 questions numbered 1 through 13.

   b) The afternoon session consists of 8 questions numbered 14 through 21.

   The points for each question are indicated at the beginning of the question.

2. Failure to stop writing after time is called will result in the disqualification of your answers or further disciplinary action.

3. While every attempt is made to avoid defective questions, sometimes they do occur. If you believe a question is defective, the supervisor or proctor cannot give you any guidance beyond the instructions on the exam booklet.

Written-Answer Instructions

1. Write your candidate number at the top of each sheet. Your name must not appear.

2. Write on only one side of a sheet. Start each question on a fresh sheet. On each sheet, write the number of the question that you are answering. Do not answer more than one question on a single sheet.

3. The answer should be confined to the question as set.

4. When you are asked to calculate, show all your work including any applicable formulas.

5. When you finish, insert all your written-answer sheets into the Essay Answer Envelope. Be sure to hand in all your answer sheets because they cannot be accepted later. Seal the envelope and write your candidate number in the space provided on the outside of the envelope. Check the appropriate box to indicate morning or afternoon session for Exam GIFREU.

6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

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****BEGINNING OF EXAMINATION****
Morning Session

1. (*6 points*)

(a) (*4 points*) Compare the operating income perspective with the fair value perspective with respect to the measurement of general insurer total profits. Include the following for each perspective in your comparison:

(i) Elements included in the computation of underwriting income

(ii) Elements included in the computation of investment income

(iii) One disadvantage

(iv) One advantage

(b) (*0.5 points*) Identify which perspective is used for the measurement of general insurer total profits in the NAIC Insurance Expense Exhibit.

(c) (*1 point*) Explain why economic accounting would show higher capital amounts for a company than U.S. statutory accounting.

(d) (*0.5 points*) Describe the adjustment(s) required to IFRS 4 capital to give market value capital.

2. (*4 points*)

(a) (*0.5 points*) Identify two qualitative attributes of an insurer that are typically examined by a rating agency during the interactive meetings between the rating agency and the insurer.

(b) (*1 point*) Explain why public data from an insurer is generally insufficient for a rating agency's quantitative analysis of the insurer.

(c) (*0.5 points*) Explain why an insurer should not withhold data that may lower its financial rating from a rating agency when the data has not been requested by the rating agency.

Rating agency A.M. Best has three liquidity ratios (quick, current and overall) in its *Key Rating Guide*.

(d) (*2 points*) Compare the three A.M. Best liquidity ratios with respect to:

(i) Assets included in the computation of the ratio, and

(ii) What the ratio is intended to measure.

3. (*5 points*) Ultimate Personal Insurance (UPI) writes personal automobile liability (PAL) and personal automobile physical damage (PAPD) insurance. You are given the following information for UPI:

Net Premiums (amounts in millions)						
Calendar Year	**Earned**	**Written**	**Earned**	**Written**	**Earned**	**Written**
	PAL	**PAL**	**PAPD**	**PAPD**	**TOTAL**	**TOTAL**
2013	7.2	7.4	3.7	3.7	10.9	11.1
2014	7.6	7.8	3.6	3.5	11.2	11.3
Average Year-to-Year Growth Rate using Gross Premiums						
Calendar Years Used	**Earned**	**Written**	**Earned**	**Written**	**Earned**	**Written**
	PAL	**PAL**	**PAPD**	**PAPD**	**TOTAL**	**TOTAL**
2011 to 2014	20%	17%	18%	11%	19%	15%
2009 to 2014	23%	23%	25%	21%	24%	22%

2014 NAIC Risk Based Capital (RBC) charges for (in millions)	
off-balance-sheet items and investments in insurance company subsidiaries	1.1
credit risk from non-invested asset receivables	0.2
credit risk from reinsurance recoverables	1.8
fixed-income securities risk	0.3
equities risk	0.5
reserve risk before any excess growth adjustment	2.3
basic written premium risk	3.1

- As of December 31, 2014, none of UPI's reinsurance recoverables were overdue.
- UPI's unpaid loss and loss adjustment expenses as of December 31, 2014 were 11.7 million for PAL and 0.8 million for PAPD.
- UPI's policyholders' surplus was 5 million as of December 31, 2014 and 4.5 million as of December 31, 2013.

(a) (*4 points*) Calculate UPI's RBC ratio for 2014.

(b) (*1 point*) Explain what actions, if any, are indicated by the RBC ratio calculated in part (a) from UPI and the regulator.

4. (*5 points*)

(a) (*2.5 points*) Describe one Annual Statement disclosure that is required for each of the following items as noted in the Statements of Statutory Accounting Principles:

(i) Correction of material errors

(ii) Estimated loss from the impairment of an asset where the amount of the loss cannot be reasonably estimated

(iii) Structured settlements

(iv) Reinsurance recoverables

(b) (*1.5 points*) Describe the purpose and scope of the disclosure in the Annual Statement Notes to Financial Statements for asbestos and environmental liabilities.

Under the rules of U.S. statutory accounting, most assets that cannot be used to pay policyholder claims are not admitted on the balance sheet. There are, however, some assets that cannot be used to pay policyholder claims that are at least partially admitted on the balance sheet.

(c) (*0.5 points*) Identify an example of an asset that cannot be used to pay policyholder claims that is at least partially admitted on the statutory balance sheet.

(d) (*0.5 points*) Explain the justification for allowing the asset identified in part (c) to be admitted on the statutory balance sheet.

5. (*4 points*)

(a) (*0.5 points*) Describe the relationship between rate regulation and the size of residual automobile insurance markets based upon U.S. experience as noted in the Facility Association of Canada (FAC) report "*Considerations for Residual Market Regulation.*"

(b) (*1.5 points*) Describe three non-monetary barriers to the residual market that regulators in North America have used to limit the size of residual automobile insurance markets.

(c) (*2 points*) Explain the justification offered by the FAC for recommending the elimination of non-monetary barriers.

6. (*5 points*) Gene-Genie, a pharmaceutical company in the United States, designed a new cancer fighting prescription drug Hope-G1. This drug was approved by the Food and Drug Administration (FDA) for use in cancer patients. The drug's label contained a general warning that Hope-G1 should not be used by "pregnant women or those that planned to become pregnant." The label was approved by the FDA.

After FDA approval, Gene-Genie discovered that there was a danger that fetuses could be born with deformities if pregnant women took the drug. Gene-Genie already had a general warning against its use by pregnant women and it believed that if it wanted to strengthen the warning to include this specific risk, it would need to apply to the FDA again. For this reason, Gene-Genie did not alter the warning label for Hope-G1.

Some physicians prescribed the drug to cancer patients that were pregnant. A number of children of these patients were born with deformities requiring expensive treatment and long-term care. Gene-Genie then withdrew Hope-G1 from the market until a new warning label citing the specific risks was approved by the FDA. The drug had been on the market for three years with the original warning. Gene-Genie estimates that less than one thousand pregnant women took the drug during this time period.

Five couples, each having children born with deformities due to the use of Hope-G1, sued Gene-Genie charging it with failure to properly warn of the risks of Hope-G1. After a lengthy jury trial costing 2.5 million to defend, the court ruled against Gene-Genie and awarded the plaintiffs 5 million each for compensatory damages. Within weeks after the ruling, over one hundred suits were filed against Gene-Genie as part of a mass tort action regarding the use of Hope-G1 by pregnant women.

(a) (*2.5 points*) Assess the consistency of the court's ruling in favor of the plaintiffs with the precedent setting case of *Wyeth v. Levine*.

Gene-Genie's general liability insurance provider, Med-Pharm Ensure (MPE), provided a policy which makes it a duty of the insurer to defend its insured against third-party claims. The policy also requires that the insurer be reimbursed for defense and other costs related to claims beyond the policy's coverage. The MPE policy excludes liability claims from drugs used in obstetric care. MPE paid for the defense of the claims against Gene-Genie, but after the court's ruling noted that it considered them to be liability claims resulting from drugs used in obstetric care and not covered by the policy.

(b) (*1 point*) Assess MPE's ability to recover the 2.5 million in defense costs using the precedent setting case of *Buss v. Superior Court* as a guide.

(c) (*1.5 points*) Explain three reasons why the Hope-G1 mass tort would not be similar to the asbestos mass tort with respect to ultimate costs.

7. (*5 points*)

(a) (*0.5 points*) Explain why the Internal Revenue Service uses Schedule P Part 1 instead of Schedule P Part 3 for the loss payment pattern procedure used in the calculation of tax basis reserves.

(b) (*0.5 points*) Identify two reasons why an insurer may elect not to use its own loss reserve discount factors for the calculation of tax basis reserves.

You are in the process of reviewing tax calculations for a general insurer in the U.S. and are given the following information:

Amounts for 2014 (in millions)	
Net underwriting gain (loss)	(200)
Taxable interest income	250
Tax-exempt municipal bond interest income	800
Dividends received	100
Realized capital gains	50
Unrealized capital gains	6

Percentages for 2014	
Percentage of income that escapes regular income taxation to include in *Alternative Minimum Taxable Income*	75%
Proration percentage for tax-exempt income	15%
Dividends Received Deduction percentage	70%

- Premium volume of the company is constant over the last three calendar years, with no material changes in policy forms or accounting practices.
- Net unearned premium reserves as of December 31, 2014 were 1.4 billion.
- The change in loss reserves during 2014 was +9 million.
- The loss reserve discount factor was 90% as of December 31, 2013 and December 31, 2014.

(c) (*4 points*) Calculate the Alternative Minimum Taxable Income for calendar year 2014.

8. (*4 points*) CWI, a large commercial property owner in the U.S., contacts an insurance broker, Pat Cache, about obtaining insurance that includes coverage for hurricane damage. Pat has two options for placing the business: Really Big Insurance Company (RBIC) and New Commercial General Insurance (NCGI).

The policy conditions offered by both insurers are generally comparable. Pat notes the following information for RBIC and NCGI with respect to the CWI placement:

	RBIC	**NCGI**
Policy Limit for contents	Adequate	Deficient by 10%
Policy premium	1 million	0.9 million
Policy aggregate deductible	10,000	10,000
Deductible for losses from hurricane damage	2% of total insured value	5% of total insured value
Broker commission	10% of premium	20% of premium
A.M. Best Financial Rating	A++	B–

Placing business with NCGI will help the broker achieve a business growth bonus commission from NCGI. Pat reports to CWI that NCGI's price and coverage are the best available for CWI and that NCGI is financially secure. Pat assures CWI that the NCGI policy will cover all hurricane damage if it occurs. Pat further induces CWI to accept NCGI's policy by offering to CWI 25% of the regular broker commission Pat receives from NCGI. CWI relies on Pat's recommendation to purchase the policy from NCGI.

During the policy period, a hurricane occurs damaging CWI's property. The claim payment from NCGI to CWI is significantly below the amount of damages due to CWI's underinsurance of contents and the high deductible for losses from hurricane damage.

Assess Pat's actions with respect to CWI's insurance placement giving consideration to the following:

(i) Fiduciary responsibilities

(ii) Errors and omissions

(iii) NAIC Unfair Trade Practices Act

9. (*4 points*) The National Flood Insurance Program (NFIP) is generally a voluntary program managed by the federal government. There is, however, an exception to this.

(a) (*0.5 points*) Describe a situation in which the purchase of a NFIP policy is considered mandatory by federal law.

(b) (*1 point*) Provide one argument for and one argument against including an explicit cost of capital component in the NFIP ratemaking process.

The Biggert-Waters Flood Insurance Reform Act of 2012 (Biggert-Waters) included many reforms to the NFIP. One of these was a provision for the NFIP to establish a reserve fund.

(c) (*1 point*) Describe the Biggert-Waters methodology for establishing the NFIP reserve fund.

The NFIP includes a number of broad risk classes. One of these classes is the AE zone which is defined as "*areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods.*"

Consider two separate buildings, identical with regard to design and construction, insured by the NFIP. Both buildings are classified as AE zone properties with the same coverage details. One property is located on the Atlantic Coast in the Northeast, while the other is located on the Gulf Coast.

(d) (*0.5 points*) Explain why the NFIP may charge different premiums to the two properties.

A number of scientific studies indicate that climate change will cause oceans to rise over the next century. These studies note that annual changes will likely be gradual, but the cumulative effect over the next century will be significant.

(e) (*1 point*) Explain how this information could be used in determining full actuarial rates for NFIP policies in coastal regions.

10. (*4 points*) In *Philip Morris USA v. Williams*, the U.S. Supreme Court reviewed issues concerning punitive damages awards. One of the issues reviewed was whether or not punitive damages awards in a case can include "punishment for the effects of a defendant's conduct on non-parties."

(a) (*1 point*) Explain the argument that Williams used to assert that punishment for the effects of a defendant's conduct on non-parties should be included in the punitive damages award.

(b) (*1 point*) Explain the argument Philip Morris used to assert that punishment for the effects of a defendant's conduct on non-parties should be excluded from the punitive damages award.

(c) (*2 points*) Explain the U.S. Supreme Court decision in *Philip Morris USA v. Williams*, regarding whether or not punitive damages awards in a case can include punishment for the effects of a defendant's conduct on non-parties.

11. (*5 points*) Savvy Insurance (SI) is a general insurer that is seeking aggregate excess of loss reinsurance protection (i.e., stop-loss reinsurance protection) from reinsurance company Re-X.

Re-X has proposed the following terms for the aggregate excess of loss reinsurance contract:

- Layer of 80 million excess of 15 million
- Reinsurance premium of 6 million for 90% coverage (i.e., SI coinsurance of 10% in the aggregate excess layer)

SI's total direct business has expected premium of 17 million and an aggregate loss distribution (before any reinsurance) approximated as follows:

Aggregate Loss (millions)	Probability
6	0.800
10	0.100
22	0.050
30	0.030
80	0.015
120	0.005

The annual after-tax investment yield is 2.0% based upon the one-year Treasury rate at inception of the reinsurance treaty.

(a) (*4 points*) Calculate the following amounts for Re-X's proposed reinsurance contract:

(i) Value at Risk (VaR) at the 90th percentile

(ii) Tail Value at Risk (TVaR) at the 90th percentile

(iii) Expected Reinsurer Deficit (ERD)

(iv) Right Tailed Deviation (RTD) with $\alpha = 4$

(b) (*1 point*) Assess the appropriateness of the use of reinsurance accounting by SI for this reinsurance treaty.

12. (*5 points*)

(a) (*2 points*) Compare the following items with respect to appointed actuaries in the U.S. and appointed actuaries in Canada:

(i) Experience required to be the appointed actuary

(ii) Recommendations to the Board of Directors regarding the insurer's operations

(b) (*1.5 points*) Explain why the Statement of Actuarial Opinion (SAO) in the U.S. does not include the appointed actuary's range of reasonable estimates of reserves.

(c) (*0.5 points*) Identify the report in the U.S. that includes the appointed actuary's range of reasonable estimates of reserves.

(d) (*1 point*) Identify two considerations the appointed actuary should take into account in determining whether or not it is reasonable to make use of another's unpaid claims estimate analysis or opinion in a SAO according to Actuarial Standard of Practice (ASOP) No. 36.

13. (*4 points*) The International Actuarial Association (IAA) identifies five key areas in which active actuarial participation may be considered valuable for involvement in prudential supervision. One of the key areas identified is “Monitoring the expectations of policyholders and potential policyholders where policies allow the management of insurance companies to exercise discretion over contractual terms and conditions.”

(a) (*1 point*) Identify the four other key areas in which active actuarial participation may be considered valuable for involvement in prudential supervision according to the IAA.

(b) (*2 points*) Describe how insurance supervision in the United States makes use of actuarial involvement for three of the four key areas identified in part (a).

With respect to actuarial involvement in prudential supervision, the IAA notes that the responsible actuary requires access to all relevant company information as well as the ability to report any concerns to management of the company and, if necessary, the Board of Directors. Laws or statutes are often enacted giving the responsible actuary the legal right to access the required information plus the legal right to report to management and the Board of Directors.

(c) (*1 point*) Describe two other laws or statutes that should exist in order to assist and protect the responsible actuary in the fulfillment of his or her statutory duties.

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

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