CURATED PAST EXAM ITEMS
- Solutions -

GI 201 – Operational, Financial, Regulatory and Legal

Important Information:

- These curated past exam items are intended to allow candidates to focus on past SOA fellowship assessments. These items are organized by topic and learning objective with relevant learning outcomes, source materials, and candidate commentary identified. We have included items that are relevant in the new course structure, and where feasible we have made updates to questions to make them relevant.
- Where an item applies to multiple learning objectives, it has been placed under each applicable learning objective.
- Candidate solutions other than those presented in this material, if appropriate for the context, could receive full marks. For interpretation items, solutions presented in these documents are not necessarily the only valid solutions.
- Learning Outcome Statements and supporting syllabus materials may have changed since each exam was administered. New assessment items are developed from the current Learning Outcome Statements and syllabus materials. The inclusion in these curated past exam questions of material that is no longer current does not bring such material into scope for current assessments.
- Thus, while we have made our best effort and conducted multiple reviews, alignment with the current system or choice of classification may not be perfect. Candidates with questions or ideas for improvement may reach out to education@soa.org. We expect to make updates annually.

GI 201 Curated Past Exam Solutions

GIFREU, Fall 2020, Q3

GI 201 LO3

Learning Objectives:

3. The candidate will understand tort law and insurance law with respect to general insurance.

Learning Outcomes:

(3a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

Sources:

Excerpts from Business Law for Insurance Professionals, Institutes Custom Publishing

- Assignment 1 (Contract Law: Insurance Applications)

Commentary on Question:

This question tested a candidate's basic understanding of insurance contract law.

Solution:

(a) Identify the four elements that any contract must include in order to be legally enforceable.

Agreement, Capacity to contract, Consideration, Legal purpose

(b) Identify four other special characteristics of an insurance contact

Commentary on Question:

There are more than four other special characteristics.

Conditional, Involve fortuitous events (and exchange of unequal amounts), Utmost good faith, and Adhesion

(c) Provide the following regarding this special characteristic:

- Identify the special characteristic
- Describe the special characteristic

(i) Utmost good faith

(ii) An obligation to act in complete honesty and disclose all relevant facts.

(d) Describe what an insurer must establish in order for the insurer to be released from its obligations for each of the following acts by the insured.

(i) Concealment

(ii) Misrepresentation

(i) Concealment: An intentional failure to disclose information in which the information that was not disclosed was a material fact.

(ii) Misrepresentation: An unintentional false statement of a material fact in which the insurer relied in this false statement.

GIFREU, Fall 2020, Q14

GI 201 LO2

Learning Objectives:
2. The candidate will understand the regulatory environment for general insurance.

Learning Outcomes:
(2a) Describe the functions and goals of the different forms of insurance regulation.
(2c) Understand the issue of discrimination and insurance.

Sources:
Insurance and the discrimination laws: motor and travel insurance, Edmunds

Insurance Regulation, The Institutes

- Chapter 8 (Rate Regulation)

Commentary on Question:
This question tests a candidate's understanding of the ECJ decision to ban the use of gender for insurance policies in the EU.

Solution:
Explain whether or not each of the following insurer actions by an automobile insurer in the EU the EU would be permitted:

(i) Providing a rate discount to insureds employed in specific jobs, that are typically dominated by females in the workforce, in which those employed in those jobs show a significantly lower loss cost than the average.

(ii) Testing insureds for signs of hearing loss and surcharging policies where the insured shows signs of hearing loss for frequencies above 1,000 Hertz. Studies have shown that drivers with significant hearing loss have higher loss costs. Some audiological studies have shown that women have better hearing than men at frequencies above 3,000 Hertz.

(iii) Surcharging policies where the automobile has an engine with a power rating of over 250 horsepower. This is in addition to the vehicle rating factor. Studies have shown that high horsepower vehicles have a higher loss cost than low horsepower vehicles. Two-thirds of high horsepower vehicles are driven by men.

(iv) For a direct writer, direct marketing of policies to females only.

(v) For an insurer writing through brokers, increasing broker commissions for policies where the insured is female.

Commentary on Question:

Most of these scenarios are not a strict yes or no as there is room for interpretation. Credit was earned for the explanation supporting the position. The model solution is an example of a full credit solution. It does not represent the only possible acceptable interpretation for each scenario.

- This would be highly scrutinized. In order for this to be permitted, the difference in loss cost should exist after adjusting for gender differences. This could also be problematic because there would likely be no causal connection between jobs and loss costs. The insurer would need to have a plausible causal connection.

- This could be allowed as it reflects a biological difference that affects loss costs. However, limiting it to hearing loss for high frequencies could be problematic. This distinction could be viewed as a proxy for gender. In order for this to be permitted, the surcharge should be for all forms of hearing loss. Alternatively, the insurer would need to prove that hearing loss for high frequencies only affects the driving ability creating a difference in loss costs.

- This should be allowed as gender only appears to be correlated and not the true factor which is vehicle power. Furthermore, males and females have a free choice of vehicle that is not limited by gender, so the surcharge is not discriminatory by gender. However, since vehicle is already a rating factor, the insurer would need to show that surcharging high horsepower vehicles would not be double counting this rating element.

- This should not be an issue as long as the insurer sells policies to males at the same rate.

- This would be highly scrutinized as it would incentivize brokers to only place females with that insurer and place males with other insurers. This could be viewed as a contravention of law.

GIFREU, Fall 2020, Q17

GI 201 LO7 Parts (c) and (d) are not on GI 201

Learning Objectives:

7. The candidate will understand the standards of practice and professionalism required of the actuary.

Learning Outcomes:

(7b) Describe, interpret and apply Standards of Practice as defined by the International Actuarial Association (IAA).

Sources:

International Actuarial Association, International Standard of Actuarial Practice 1, *General Actuarial Practice*

Commentary on Question:

This question tests a candidate's understanding of the actuary's responsibilities under ISAP 1.

Solution:

(a) Explain what is meant by *sufficient documentation* in the context of ISAP 1.

Commentary on Question:

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

Documentation is sufficient when it contains enough detail for another actuary qualified in the same practice area to understand the work and assess the judgments made.

(b) Provide two examples of reasonable validation steps.

Commentary on Question:

There are a number of different examples that can be given. Only two were required for full credit. The model solution is an example of a full credit solution providing two examples.

- Reconciliations to audited financial statements or other records.
- Comparing the data to that for a prior period, or periods.

~~(c) Describe a conclusion from this case.~~

Not on GI 201

~~**Commentary on Question:**~~

~~*There were several conclusions from this case. Only one was required for full credit. No credit was given for stating an observation that was not a conclusion from this case. The model solution is an example of a full credit solution providing one conclusion from the case.*~~

~~A materiality decision is qualitative and requires consideration of a wide range of factors.~~

~~(d) Compare these two types of capital analyses.~~

Not on GI 201

~~**Commentary on Question:**~~

~~*A comparison should indicate the similarity and the difference. The model solution is an example of a full credit solution.*~~

~~I. DCA tests the adequacy of capital under realistically rigorous future operating scenarios including the impact of operational risk either to supplement available funds to cover the cost of policy obligations and operations.~~
~~II. SCA tests the adequacy of capital to finance future expected new business costs and associated solvency requirements according to the organization's approved medium-term business plan.~~

GIFREU, Fall 2020, Q20

GI 201 LO3

Learning Objectives:

3. The candidate will understand tort law and insurance law with respect to general insurance.

Learning Outcomes:

(3a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

Sources:

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

Commentary on Question:

This question tests a candidate's understanding of several elements from tort law that can affect general insurance claims.

Solution:

(a) Define each of the following statutes regarding the filing of suits under tort law:

(i) Statute of limitations

(ii) Statute of repose.

(i) A statute of limitations requires a plaintiff to file a lawsuit within a specified period after the cause of action (i.e., injury/damage) has occurred.

(ii) A statute of repose requires the lawsuit to be filed within a certain period of time from when the negligent act occurred (as opposed to the injury/damage).

(b) Provide one example in which the *natural conditions rule* for landowners might not necessarily apply.

Commentary on Question:

Many examples are possible. The key is that the landowner could be liable for a natural condition despite the natural conditions rule. For full credit, examples were required to relate to a situation with a natural condition in which the rule may not apply.

In urban areas, a homeowner might be held liable for damage from a fallen tree if they hadn't use reasonable care to inspect the tree on their property.

(c) Explain how each of these two concepts relate to the common-law principle of *contributory negligence* as a defense to negligence actions.

Commentary on Question:
There were several ways that this could be explained to earn full credit. The model solution is an example of a full credit solution.

I. Last clear chance doctrine was an effort to avoid harsh results of contributory negligence by assigning all blame to the party who had the last clear chance to avoid harm but failed to do so.

II. Assumption of risk defense means that the plaintiff cannot make a claim against the defendant if they voluntarily assumed risk, even though the defendant was negligent. Used for hazardous activities. It is a form of contributory negligence, but bars claims for the assumption of risk.

(d) Today, almost all jurisdictions have abandoned the common-law concept of *contributory negligence* in favor of the rule of *comparative negligence.* The specific rules for the application of *comparative negligence* vary by jurisdiction. There are four common variations of the rule that have been used. Two of these variations are the *49 percent rule* and the *50 percent rule*.

Identify the two other common variations of the rule.

- pure comparative negligence rule
- slight versus gross rule

(e) State the amount that JJ will recover from each of the defendants.

Commentary on Question:
The key to earning full credit is recognizing that under the 49 percent rule with three or more parties, JJ cannot recover from KK but JJ can recover the total amount (not at fault) from LL.

JJ would not collect anything from KK because his negligence is not less than KK's. JJ would collect 72.5% or $72,500 from LL because JJ's negligence is less than LL's.

GIFREU, Spring 2021, Q7

GI 201 LO5

Learning Objectives:

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

Learning Outcomes:

(5b) Understand and apply the concepts of insurance accounting.

(5f) Understand and apply the concepts of reinsurance accounting.

Sources:

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

- Chapter 4 (Accounting for Reinsurance Contracts)

Commentary on Question:

This question tests a candidate's knowledge of reinsurance accounting.

Solution:

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

Commentary on Question:

There are more than two characteristics that make its accounting complex for the primary insurer. Only two were required for full credit. The model solution is an example of a full credit solution with two characteristics.

- Reinsurers may not be able to fulfil their future financial obligations to the primary insurer.
- Reinsurance may include features that limit the transfer of risk.

(b) 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)

Commentary on Question:

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

(i) Timing: Whatever the report lag is for claims from the insurance contract to the primary insurer, there will be additional lag for reporting of claims to the assuming reinsurer. For example, if the primary insurer reports monthly to the reinsurer, the additional report lag could be 45 days.

(ii) Lines of Business: The line-of-business breakdown for assumed reinsurance is likely to be less granular than for primary insurance. This is mainly because reinsurance losses and premiums are determined for primary lines of business combined that are then not easily divisible.

(iii) LAE: Claims reporting for primary insurance includes LAE. For reinsurance, treatment of LAE is specified in the reinsurance contract. Many reinsurance contracts include allocated LAE, while some exclude it. Most contracts exclude unallocated LAE, but some do include it.

(c) 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

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

(i) Experience Refunds: These are adjustments that depend on the experience of the ceding insurer during the term of the treaty. This directly transfers risk back to the primary insurer as the reinsurance premium is adjusted for experience.

(ii) Cancellation Provisions: These are provisions that permit the reinsurer to cancel the treaty before the expiration date if experience is worse than expected. This limits the reinsurer's risk, transferring risk back to the primary insurer.

(iii) Combinations of Lines: These are provisions linking low-risk business to high-risk business. Consider the following example. A primary insurer writes low-risk personal lines and high-risk commercial lines. It requires a 50% quota share treaty for its high-risk business. In exchange for this, the reinsurer requires a quota share treaty on the low-risk business to limit its risk. This essentially transfers risk back to the primary insurer.

(iv) Payment Schedules: These are provisions limiting recoverables to an annual maximum or deferring them for several years. This transfers some of the reinsurer's risk back to the primary insurer.

GIFREU, Spring 2021, Q8

GI 201 LO2

Learning Objectives:
2. The candidate will understand the regulatory environment for general insurance.

Learning Outcomes:
(2e) Describe the development of general insurance programs controlled by government or collective insurance industry organizations and their mechanisms of operation.

Sources:
Government Provision of General Insurance, SOA

Private Flood Insurance and the National Flood Insurance Program, Congressional Research Service

Commentary on Question:
This question required the candidate to consider positives and/or negatives for the three options. Full credit was earned by providing a valid critique for each option. Widely varying full credit solutions were possible. The model solution is just one example of a full credit solution.

Solution:
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.

(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.

(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.

(i) Unless the government insurer's rates (with catastrophe cover) were significantly above the private industry rates (without the catastrophe cover endorsement), private insurers would cease to write homeowners insurance in Catalandia. It is likely that the government would become a monopolistic insurer for homeowners insurance. Furthermore, charging a single rate per thousand coverage for all insureds does not promote risk mitigation – those with lower risk should pay a lower rate.

(ii) This option would likely promote a continued competitive environment for homeowners insurance. However, there would be no competitive pricing for the catastrophe endorsement. This may give private insurers the ability to ease pricing on homeowners non-catastrophe coverage. Furthermore, the uniform rate would not encourage risk mitigation. However, it should ease affordability issues.

(iii) Like option (ii), this option would likely promote a continued competitive environment for homeowners insurance. But this would be dependent on the catastrophe excess reinsurance terms available from the government-owned reinsurance company. This option would promote competitive pricing for the catastrophe endorsement which could lead to risk mitigation strategies as those with higher risk would pay more. However, this could potentially create affordability problems.

GIFREU, Spring 2021, Q14

GI 201 LO3

Learning Objectives:

3. The candidate will understand tort law and insurance law with respect to general insurance.

Learning Outcomes:

(3f) Understand the international legal environment as it relates to general insurance.

Sources:

Excerpts from Business Law for Insurance Professionals, Institutes Custom Publishing, Assignment 3 (The International Legal Environment)

Commentary on Question:

This question tests a candidate's understanding of certain aspects of the international legal environment.

Solution:

(a) Contrast these two legal systems with respect to the following:

(i) Framework for legal decisions

(ii) Role of the judge

Commentary on Question:

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

(i) Framework
In the civil-law system, the framework is a written code of statutes. In the common-law system, the framework is precedent cases.

(ii) Role of judge
In a civil-law system, the role of the judge is to find the correct legislative provision within a written code of statutes and apply it to the facts in a case. In a common-law system, the role of the judge is to interpret facts of the case, examining rulings in precedent cases and making a decision on the facts of the case taking into account the precedent cases.

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

- Resource seekers – Companies enter a foreign market to access that market's resources.
- Market seekers – Companies enter a foreign market to acquire new customers.
- Market followers – Companies enter a foreign market to follow their current customers into the market.

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

Commentary on Question:
There are more than four financial risks. Only four were required for full credit. The model solution is an example of a full credit solution.

- Risk of fluctuation in foreign currency causing fluctuations in income earned from a foreign subsidiary
- Risk of restrictions on movements of foreign held assets
- Risk of expropriation of foreign assets
- Risk of dealing with differing accounting standards and procedures

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

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

The U.S. has a common law system, while Country B has a civil law system. The different legal system in Country B will likely result in differences for insured loss experience affecting both loss development and rating. The U.S. experience will be of limited or no value in reserving and ratemaking liability coverages in Country B.

GIFREU, Spring 2021, Q19

GI 201 LO2

Learning Objectives:
2. The candidate will understand the regulatory environment for general insurance.

Learning Outcomes:
(2e) Describe the development of general insurance programs controlled by government or collective insurance industry organizations and their mechanisms of operation.

Sources:
Government Provision of General Insurance, SOA

Commentary on Question:
This question tests a candidate's knowledge of WC coverage.

Solution:
(a) Describe four common characteristics of workers compensation (WC) programs found in most industrialized countries.

Commentary on Question:
There are more than four common characteristics. Only four were required for full credit. The model solution is an example of a full credit solution.

- Employees give up the right to sue an employer
- Employees receive prompt no-fault compensation with benefits that are defined by statute
- Incentives are established to promote workplace safety
- Coverage is compulsory for most employers in the jurisdiction

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

Commentary on Question:
There are more than two features that can be cited. Only two were required for full credit. The model solution is an example of a full credit solution.

- Participation by employees is compulsory
- Benefits are specified by statutes

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

Commentary on Question:
There are more than four factors. Only four were required for full credit. The model solution is an example of a full credit solution.

- Low investment portfolio yields due to the prolonged low interest rate environment. The reduced investment income will influence underwriting and rating putting upward pressure on rates.
- The average age of employees is rising over time. The duration of claims tends to be longer for older workers. Older workers are also more susceptible to bone fractures. This is causing an increase in claim costs.
- Their appears to be an increasing incidence of obesity. Obese workers' claim frequency is double that of non-obese workers. Medical and indemnity costs (i.e., claim severity) are significantly higher for obese workers.
- There appears to be a problem from the overuse of narcotic pain killers. The long-term use of narcotic pain killers for pain management increases the likelihood that the employee will not return to work because of drug addiction/dependency. This will increase claim costs.

GIFREU, Spring 2021, Q20

GI 201 LO3

Learning Objectives:

3. The candidate will understand tort law and insurance law with respect to general insurance.

Learning Outcomes:

(3a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

(3d) Understand mass torts/class action suits and discuss their effect on the general insurance industry.

(3j) Describe and interpret legal cases/issues included in the syllabus resources.

Sources:

Tort Law: Topics for General Insurance Actuaries, SOA

Commentary on Question:

This question tests a candidate's knowledge of the asbestos mass tort.

Solution:

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

Commentary on Question:

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

The asbestos mass tort involved what was viewed by the insurance industry as the liability of exposure to asbestos—a product. Products liability insurance coverage has a set aggregate policy limit. Courts interpreted that premises and operations liability insurance coverage was applicable to claims from asbestos exposure, not products liability insurance coverage. Premises and operations liability insurance coverage only has an occurrence limit and no aggregate policy limit. This exposed insurers to potentially unlimited liability when each claim is considered a separate occurrence.

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

Commentary on Question:

There are many reasons why this occurred. The model solution is an example of a full credit solution that provided several (but not all) reasons in an explanation.

The trust had insufficient funds for all the claims it was faced with. Furthermore, the trust would only pay 10% of the full value for each claim.

Despite Manville being the largest supplier of asbestos and asbestos products, there are other suppliers. In addition to this, the courts have allowed peripheral defendants to be sued.

With multiple trusts and a vast number of claimants, it has been a challenge for trust administrators to be vigilant with respect to detecting fraudulent claims, so litigation continues.

GIFREU, Fall 2021, Q1

GI 201 LO2

Learning Objectives:
2. The candidate will understand the regulatory environment for general insurance.

Learning Outcomes:
(2e) Describe the development of general insurance programs controlled by government or collective insurance industry organizations and their mechanisms of operation.

Sources:
Government Provision of General Insurance, SOA

Commentary on Question:
This question tests a candidate's understanding of government involvement in the provision of insurance programs.

Solution:
(a) Provide three reasons that may justify the government producing and marketing certain insurance products directly rather than relying on the private insurance industry.

Commentary on Question:
There are more than three reasons. Only three were required for full credit. The model solution is an example of a full credit solution.

- To fill insurance needs not met by private insurers (i.e., residual market philosophy).
- To force people to buy the insurance.
- To achieve collateral social objectives.

(b) Provide two questions that should be considered in the evaluation of the effectiveness of government insurance programs.

Commentary on Question:
There are more than two questions. Only two were required for full credit. The model solution is an example of a full credit solution.

- Does the government program supply a needed service or achieve a social goal that cannot be reasonably provided by private insurance?
- Does the program adhere to insurance principles or has it taken on the characteristics of a welfare program?

(c) Describe three distinguishing characteristics of social insurance programs.

Commentary on Question:
There are more than three characteristics. Only three were required for full credit. The model solution is an example of a full credit solution.

- Program is defined by statute.
- Benefits are not based on overall financial needs but are a matter of right.
- A defined level of protection designed to provide adequate benefits.

(d) Provide two differences between social welfare programs and social insurance programs.

Commentary on Question:
There are more than two differences. Only two were required for full credit. The model solution is an example of a full credit solution.

- Social welfare programs are financed from taxation, not dedicated premium charges as in many social insurance programs.
- In social welfare programs the benefits in the system are linked to the overall financial needs of the recipient. This is not the case for social insurance.

GIFREU, Fall 2021, Q3

GI 201 LO3

Learning Objectives:

3. The candidate will understand tort law and insurance law with respect to general insurance.

Learning Outcomes:

(3a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

Sources:

Tort Law: Topics for General Insurance Actuaries, SOA

Commentary on Question:

This question tests a candidate's understanding of U.S. tort law and tort reforms.

Solution:

(a) Identify two direct costs of the tort system other than amounts paid to claimants.

Commentary on Question:

There are more than two direct costs other than amounts paid to claimants. Only two were required for full credit. The model solution is an example of a full credit solution.

- Legal expenses
- Claim adjustment expenses

(b) Identify two indirect costs of the tort system.

Commentary on Question:

There are more than two indirect costs. Only two were required for full credit. The model solution is an example of a full credit solution.

- Amounts spent to reduce potential liability claims
- Opportunity costs of products/services that are withdrawn from markets due to concerns over potential liability claims

(c) Describe two types of tort reform that directly address the amounts paid to claimants.

Commentary on Question:

There are more than two types of tort reform that directly address the amounts paid to claimants. Only two were required for full credit. The model solution is an example of a full credit solution.

- Punitive damages reform restricts the application of and/or amount of punitive damages awards.
- Noneconomic damages reform directly limits amounts paid to claimants for noneconomic damages.

(d) Explain how enactment of joint and several liability tort reform addresses fairness.

This rule could permit a plaintiff to recover an entire award from a defendant that is minimally at fault. This raises the issue of fairness. Joint and several liability reforms generally include some restrictions on the application of this rule or the introduction of some form of proportionate liability whereby those with minimal fault only pay based upon their degree of fault.

(e) Explain how enactment of joint and several liability reform can indirectly control costs of the tort system.

Commentary on Question:
There are several different ways that joint and several liability reform can indirectly control costs of the tort system. The model solution is an example of a full credit solution.

Before joint and several liability reforms were enacted, some cases would be brought against multiple defendants in which one of the defendants had a large amount of resources (wealth and insurance) but was minimally at fault while the other defendants that were mainly at fault had extremely limited resources. After this type of reform, some of these types of cases were not brought before the courts as the collection of a major award would not be possible. As such, this type of reform indirectly reduces the costs of the tort system by reducing the number of cases.

GIFREU, Fall 2021, Q7

GI 201 LO2

Learning Objectives:
2. The candidate will understand the regulatory environment for general insurance.

Learning Outcomes:
(2a) Describe the functions and goals of the different forms of insurance regulation.
(2c) Understand the issue of discrimination and insurance.

Sources:
Insurance and the discrimination laws: motor and travel insurance, Edmunds

Usage-Based Insurance and Telematics, SOA

Commentary on Question:
This question tests a candidate's understanding of the issues regarding discrimination in ratemaking,

Solution:
(a) Provide arguments for or against this decision from the viewpoint of insurers.

Commentary on Question:
Many potential arguments for or against the decision can be made. The model solution is an example of the type of solution with arguments "for" this decision that would earn full credit. Full credit could also be earned by providing arguments "against" this decision.

The ECJ, in its decision to ban the use of gender in pricing insurance products in the EU, strengthens the notion of social equity by making insurers subject to the Equality Act. Insurers should not have an exemption from following discrimination laws.

Insurers may argue from the point of view of actuarial equity noting the existence of cost differences by gender for certain insurance products. But this is not a sufficient reason to allow discrimination. If insurers could prove a cost difference between races or religious backgrounds, it would still be both legally and socially unacceptable for insurers to discriminate on this basis. Discrimination by gender is not socially acceptable and against discrimination laws.

(b) Describe one advantage and one disadvantage of the UBI approach to pricing compared to gender-based pricing.

Commentary on Question:
There are both several advantages and disadvantages. Only one of each was required for full credit. The model solution is an example of a full credit solution.

Advantage: UBI discriminates on a driver's driving habits so it is fair to discriminate on this basis. Furthermore, a driver has the ability to change their driving habits. Gender-based pricing discriminates on the basis of a driver's genetics that do not directly relate to loss costs. As such, it may be viewed as unfair discrimination.

Disadvantage: Gender differences for automobile loss costs is greatest for young drivers. Some of the loss cost difference between the genders for young drivers may be due to factors not captured by UBI. Furthermore, many UBI programs use smartphone apps which can be turned on/off by the user making the data captured less reliable. As such gender-based pricing could still be more accurate for young drivers.

GIFREU, Fall 2021, Q8

GI 201 LO5

Learning Objectives:

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

Learning Outcomes:

(5b) Understand and apply the concepts of insurance accounting.

(5c) Understand and compare different financial reporting standards for general insurers.

Sources:

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

- Chapter 2 (Accounting for Insurance Contracts)
- Chapter 3 (Accounting for Financial Instruments)

Commentary on Question:

This question tests a candidate's understanding of the accounting for an insurer's investments in bonds.

Solution:

(a) Provide TGIC's June 30, 2020 accounting entries under U.S. statutory accounting showing the following:

(i) Credits and debits to balance sheet accounts

(ii) Credits and debits to income statement accounts

(iii) Direct charges and credits to surplus

Let "M" denote millions of dollars.

Balance Sheet:

- Debit asset Cash 10M (= 4% / 2 × 500M) for bond interest
- Credit asset Cash 2.1M (= 21% × 10M) for tax
- Credit asset Cash 7.9M (=10M – 2.1M) for shareholder dividend payment

Statement of Income:

- Credit Investment income 10M for bond interest
- Debit expenses 2.1M for tax

Direct charges and credits to surplus:

- Direct charge of 7.9M for shareholder dividend payment

(b) Compare the accounting treatment for a change in the value of this bond because of a rise in interest rates under the following accounting standards:

(i) GAAP accounting

(ii) U.S. statutory accounting

Under GAAP, this bond is carried at fair value (i.e., market value) because it is categorized as available for sale. This decline in value lowers the carried amount in the balance sheet for the asset and flows through the income statement through other comprehensive income (i.e., unrealized loss) not regular income.

Under U.S. statutory accounting, this bond is carried at amortized cost because it is investment grade in good standing. This decline in value does not change the carried amount in the balance sheet for the asset and does not affect the income statement.

GIFREU, Fall 2021, Q13

GI 201 LO2

Learning Objectives:
2. The candidate will understand the regulatory environment for general insurance.

Learning Outcomes:
(2a) Describe the functions and goals of the different forms of insurance regulation.

Sources:
The General Insurance Regulatory Environment, SOA

Fundamentals of General Insurance Actuarial Analysis, J. Friedland, 2nd Edition, 2022
- Ch. 28: Rate Regulation

Commentary on Question:
This question tests a candidate's knowledge of the different forms of rate regulation.

Solution:
(a) Describe the flex rating approach to rate regulation.

A state law requiring prior approval only if the new rates exceed a certain percentage above (and sometimes below) the rates previously filed.

(b) Describe two approaches to rate regulation other than prior approval and flex rating.

Commentary on Question:
There are four other approaches described in the syllabus readings (file-and-use, use-and-file, no-file / open competition, and state mandated rates). Only two were required for full credit. The model solution is an example of a full credit response.

File-and-use: Insurer must file rates (and rules) within a specified time before use (usually thirty to ninety days). That period gives regulators a minimal opportunity to uncover violations of law or other potentially questionable practices.

No-file (or open competition). No-file, or open competition, allows insurers to develop and use rates without having to get approval or file with state regulators.

(c) Compare the insurer regulatory compliance costs for the following three approaches to rate regulation: flex rating and the two approaches in your response to part (b).

Commentary on Question:
There are many different potential responses for part (c) as it depends on the approaches selected in part (b). The model solution is an example of a full credit solution given the model solution in part (b)

File-and-use would have the highest compliance costs since insurer's would have to prepare and submit filings to the regulator for all rate changes in advance of using the rates.

Flex rating would be less costly than file-and-use because it would only require filings to the regulator for some rate changes.

No-file would have the lowest compliance costs as insurers would not have to prepare filings for the regulator.

(d) Explain how at-fault drivers bear the consequences of their actions in a no-fault automobile insurance system.

Most no-fault rating plans take at-fault accidents into account for rating purposes.

(e) Compare a pure no-fault system to a modified no-fault system.

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

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

GIFREU, Fall 2021, Q14

GI 201 LO3

Learning Objectives:

3. The candidate will understand tort law and insurance law with respect to general insurance.

Learning Outcomes:

(3a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

(3d) Understand mass torts/class action suits and discuss their effect on the general insurance industry.

Sources:

Excerpts from Business Law for Insurance Professionals, Institutes Custom Publishing

- Assignment 1 (Contract Law: Insurance Applications)

Commentary on Question:

This question tests a candidate's understanding of some of the rules and principles pertaining to insurance contract law.

Solution:

(a) Define waiver as it applies to an insurer.

Insurer's voluntary and intentional relinquishment of a known right.

(b) Define the parol evidence rule with respect to waivers.

Oral evidence of agreements preceding, or accompanying, a written insurance policy cannot be used to prove a waiver.

(c) Describe the legal principle of estoppel.

Estoppel is a legal principle that prohibits a party from asserting a claim or right that is inconsistent with that party's past statement or conduct on which another party has detrimentally relied.

(d) Describe the three events that need to take place for the principle of estoppel to apply under insurance law.

1. False representation of a material fact by the insurer [*or producer of the insurance policy*]
2. Reasonable reliance by the insured on that representation
3. Resultant injury or detriment to the insured

GIFREU, Fall 2021, Q15

GI 201 LO6

Learning Objectives:
6. The candidate will understand the analysis of a general insurer's financial health.

Learning Outcomes:
(6d) Demonstrate knowledge of the E.U. Solvency II solvency capital requirement.

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

- Chapter 12 (Solvency Monitoring)

Commentary on Question:
This question tests a candidate's knowledge of the E.U. Solvency II standard formula solvency capital requirement

Solution:
(a) Describe the calculation of the BSCR component. You may provide this formulaically or in words.

Commentary on Question:
The model solution provides the solution formulaically.

BSCR = SCR_{INT} + $[\Sigma\Sigma_{ij}\ \rho_{i,j}\ SCR_i\ SCR_j]$^0.5, where

- SCR_i is the SCR for risk component i
- $\rho_{i,j}$ is the tail correlation between risks i and j
- SCR_{INT} is the SCR for intangible asset risk

(b) Describe the purpose of the ADJ component.

It represents adjustments for the risk-absorbing effect of technical provisions and deferred taxes.

(c) Describe the calculation of the SCR-OR component. You may provide this formulaically or in words.

Commentary on Question:
The model solution provides the solution in words.

SCR-OR is calculated as the minimum of the following two amounts:

1. 30% of the BSCR
2. Maximum of gross earned premiums and technical provisions

GIFREU, Fall 2021, Q18

GI 201 LO3

Learning Objectives:

3. The candidate will understand tort law and insurance law with respect to general insurance.

Learning Outcomes:

(3a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

(3d) Understand mass torts/class action suits and discuss their effect on the general insurance industry.

Sources:

Tort Law: Topics for General Insurance Actuaries, SOA

Commentary on Question:

This question tests a candidate's understanding of class actions.

Solution:

(a) Identify the benefit of a class action from the perspective of each of the following parties:

(i) The plaintiffs

(ii) The defendants

(i) The plaintiffs: Permits claims to be brought forward in which the amount claimed is nominal on an individual basis.

(ii) The defendants: Efficiency of only having to argue a case once instead of numerous times.

(b) Identify two other prerequisites of class certification from FRCP Rule 23.

Commentary on Question:

There are three other prerequisites. Only two were required for full credit. The model answer is an example of a full credit response.

- Typicality
- Fair representation

(c) Describe the standard for commonality as decided in *Wal-Mart v. Dukes*.

The claimants must share a common cause of action, there must be a common defense against the claims from all the individuals in the class and there is a common remedy available from a court decision.

(d) Explain why the Supreme Court ruled against class certification in *Wal-Mart v. Dukes*.

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

The question of commonality was whether or not the evidence represented sufficient proof to show that female employees across the nation were subject to a national policy to discriminate them as opposed to there being a collection of independent acts of discrimination.

The evidence presented was that there wasn't a general policy of discrimination nationally. There was evidence of discrimination on a local basis by some local supervisors using discretion. Plaintiffs did not identify a common mode of exercising discretion that pervades the entire company. The defined national class was too broad.

GIFREU, Fall 2021, Q19

GI 201 LO6 *Note: This also applies to LO5*

Learning Objectives:

6. The candidate will understand the analysis of a general insurer's financial health.

Learning Outcomes:

(6a) Demonstrate knowledge of the various considerations for performance measurement of a general insurer.

(6f) Discuss the function of credit rating agencies and their influence on general insurers.

Sources:

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

- Chapter 4 (Accounting for Reinsurance Contracts)
- Chapter 12 (Solvency Monitoring)
- Chapter 13 (General Insurance Financial Ratings)

Commentary on Question:

This question tests a candidate's understanding of certain issues regarding rating agency reviews of insurers and understanding how an actuary should respond to rating agency concerns. There are many ways that this question could be answered to earn full credit. The model solution is an example of a full credit response. It does not include every possible reasonable response to the rating analyst's concerns. To earn full credit, a response required a reasonable response to all three of the rating analyst's concerns.

Solution:

You accompanied TFI senior management in the meeting with the rating agency on June 30, 2021. The lead rating analyst raised the following concerns with respect to the planning model:

(i) TFI projects significant net written premium growth of 15%, all of which is in its current regional market. This will increase its exposure to wildfires.

(ii) The projected net premium to gross premium ratio for 2021 is the same as the actual ratio for 2020 despite an increase in reinsurance costs.

(iii) The net retention level for catastrophe occurrence coverage has increased over that of 2020.

Provide a response to address each of the rating analyst's three concerns.

(i) TFI's growth in business is being monitored by management. Part of the 15% increase is due to rate increases but over 10% is due to an increase in policies written. Partial year results show that increases could exceed 15%. TFI management relaxed underwriting standards to allow greater concentrations of exposures within communities. This policy will be reviewed during the year to ensure that it does not put the company at risk. Furthermore, TFI will consider rate increases to control the new policy growth.

(ii) The fact that the projected net premium to gross premium ratio for 2020 is the same as the actual ratio for 2019 was an error. It was assumed that reinsurance rates would remain constant, but they have not. TFI will revise the reinsurance rates and produce a new set of projections that reflect the true cost of reinsurance.

(iii) TFI did increase its catastrophe net retention for 2019 as a means to control reinsurance costs. The company is confident that it has the financial capability to handle the increased retention. TFI will prepare a scenario analysis of the projections for catastrophic wildfire events using the actual reinsurance costs updated with the revised projections for the concentration of exposures.

GIFREU, Fall 2021, Q21

GI 201 LO2

Learning Objectives:
2. The candidate will understand the regulatory environment for general insurance.

Learning Outcomes:
(2h) Outline the function and regulation of captives.

Sources:
Captive Insurance, SOA

Commentary on Question:
This question tests a candidate's knowledge of captive insurance.

Solution:
(a) Identify two ART mechanisms, other than captive insurance.

Commentary on Question:
There are more than two ART mechanisms other than captive insurance. Only two were required for full credit. The model solution is an example of a full credit solution.

- Capital market securitization
- Industry loss warranties

(b) Define the following types of captive insurers:

(i) Pure captive

(ii) Group captive

(i) Captive with a single-parent company that writes only risks from the parent and/or affiliates.

(ii) Captive formed by a group of similar companies from different owners that retains only the risks from the group of companies and/or their affiliates.

(c) Provide two reasons why the decision to form a captive should not be based solely upon the benefit of tax mitigation.

Commentary on Question:
There are many possible reasons for this. Only two were required for full credit. The model solution is an example of a full credit response.

- Captives are frequently associated with offshore tax-havens. However, many countries include tax laws that limit the avoidance of tax on profits "transferred" to an offshore affiliate.
- Much of the tax savings from a captive are achieved by means of the tax treatment of loss reserves. There is always the possibility that laws permitting tax savings could be changed with little notice to eliminate these savings.

(d) Describe three drawbacks to creating a captive insurance company that are unrelated to taxes.

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

- Cost of capitalization and administration at startup are high.
- Operating expenses for maintaining the captive can be high.
- Company is fully exposed to the risk of the captive carrying inadequate loss reserves.

GIFREU, Spring 2022, Q4

GI 201 LO3

Learning Objectives:
3. The candidate will understand tort law and insurance law with respect to general insurance.

Learning Outcomes:
(3a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.
(3j) Describe and interpret legal cases/issues included in the syllabus resources.

Sources:
Tort Law: Topics for General Insurance Actuaries, SOA

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

Commentary on Question:
This question tested a candidate's knowledge of the legal doctrine of "res ipsa loquitor."

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

Explain this doctrine.

Under *res ipsa loquitor*, there is a presumption of negligence by the defendant. The plaintiff need not prove negligence for the defendant to be liable. It is the defendant that must disprove negligence or causation to be free from liability.

(b) Application of this doctrine requires that three conditions are met.

Describe these three conditions.

- The event must be of a kind which ordinarily does not occur in the absence of someone's negligence.
- It must be caused by an agency or instrumentality within the exclusive control of the defendant.
- It must not have been due to any voluntary action or contribution on the part of the plaintiff.

(c) 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.

The condition of *res ipsa loquitor* in which “the event must be of a kind which ordinarily does not occur in the absence of someone's negligence” was interpreted as being established through *common understanding*. This interpretation precluded the use of experts. In *States v. Lourdes Hospital*, the appellate court expanded the use of *res ipsa loquitor* by permitting the use of an expert witness to allow non-experts to understand what is considered “common understanding for experts.”

GIFREU, Spring 2022, Q5

GI 201 LO2 *Note: This also includes LO7*

Learning Objectives:

2. The candidate will understand the regulatory environment for general insurance.

Learning Outcomes:

(2a) Describe the functions and goals of the different forms of insurance regulation

(2c) Understand the issue of discrimination and insurance.

(2f) Discuss the issues with the use of credit scores by insurers.

Sources:

The General Insurance Regulatory Environment, SOA

Fundamentals of General Insurance Actuarial Analysis, J. Friedland, 2nd Edition, 2022

- Ch. 28: Rate Regulation

Insurance and the discrimination laws: motor and travel insurance, Edmunds

Use of Credit Scores by Insurers, Canadian Council of Insurance Regulators

Usage-Based Insurance and Telematics, SOA

IAA Risk Book: Professional Standards, Insurance Regulation Committee, International Actuarial Association

International Standard of Actuarial Practice 1, General Actuarial Practice, International Actuarial Association

Commentary on Question:

This question tested a candidate's understanding of various regulatory issues and actuarial responsibilities when involved in a ratemaking assignment. This question is open to many possible correct responses. Information from numerous readings in the syllabus could be used to form a response. To earn full credit, the candidate was required to outline more than one consideration and more than one next step. The model solution is an example of a full credit response. It does not include all possible valid considerations and next steps.

Solution:

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

> VK needs to ensure that their communications on this matter to both management and the insurance regulators follow the professional standards on actuarial communications. In any communications about the model, VK needs to ensure clarity of content and disclose any uncertainty in the findings, and reliance on the model and its internal data sources.

VK needs to investigate the correlations found in DNI's book to any prohibited rating factor (e.g., race). Even if a correlation exists, if it is a weak correlation, it could be acceptable with an explanation that a weak correlation of a prohibited factor to a valid rating factor should not eliminate the rating factor.

VK needs to produce statistics showing the relationship of insurance credit scores from model with insurance loss costs. Furthermore, VK needs to check whether or not there is overlap between insurance credit score and other rating factors already in use (e.g., occupation).

VK should discuss use of this model with the insurance regulators before implementing it. VK should provide regulators the results of their findings regarding this rating factor during pre-filing discussions.

GIFREU, Spring 2022, Q7

GI 201 LO3

Learning Objectives:

3. The candidate will understand tort law and insurance law with respect to general insurance.

Learning Outcomes:

(3d) Understand mass torts/class action suits and discuss their effect on the general insurance industry.

Sources:

Tort Law: Topics for General Insurance Actuaries, SOA

Commentary on Question:

This question tested a candidate's understanding of asbestos liability.

Solution:

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

Commentary on Question:

There are several reasons for this. The model solution is an example of a full credit response. It does not provide all reasons for this.

The United Kingdom has several rules of tort law that differ from those in the U.S. that reduced tort cases. These include a prohibition on contingency fees and a requirement for the unsuccessful party to pay the legal costs of the other party.

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

Commentary on Question:

There have been many issues encountered. The model solution is an example of a full credit response. It does not provide all the issues encountered.

The creation of trust funds may not have actually reduced asbestos litigation as plaintiffs are able to sue non-bankrupt defendants in addition to claiming from the trust.

Additionally, trust funds are inundated with claims when it becomes clear that the fund is insufficient to meet all its claims.

Furthermore, injured parties may make claims from multiple trusts. With multiple trusts and a vast number of claimants, it has been a challenge for trust administrators to be vigilant with respect to detecting fraudulent claims.

GIFREU, Spring 2022, Q13

GI 201 LO5

Learning Objectives:

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

Learning Outcomes:

(5f) Understand and apply the concepts of reinsurance accounting.

Sources:

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

- Chapter 4 (Accounting for Reinsurance Contracts)

Commentary on Question:

This question tested a candidate's understanding of deposit accounting for reinsurance.

Solution:

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) Cash flows/Income pattern used

(ii) Discount rate used

(iii) Amortization period of the deposit

(iv) Income presentation in the Annual Statement for changes in the deposit

(i) Cash flows/Income pattern

- The interest method uses the income pattern from the estimated cash flows.
- The present-value method derives the income pattern after the claims occur.

(ii) Discount rates

- The interest method uses the internal rate of return of the cash transactions between the reinsurer and the primary insurer.
- The present-value method uses risk-free rates for the maturity of the losses.

(iii) Amortization

- The interest method amortizes the deposit from inception to claims settlement, using the IRR derived from the cash flows.
- The present-value method amortizes the initial deposit through the end of the contract period and separately amortizes the loss costs from occurrence to settlement.

(iv) Income presentation

- The interest method presents changes in the deposit as interest income.
- The present-value method presents changes in the deposit as underwriting income.

GIFREU, Spring 2022, Q15

GI 201 LO3

Learning Objectives:

3. The candidate will understand tort law and insurance law with respect to general insurance.

Learning Outcomes:

(3a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

Sources:

Excerpts from Business Law for Insurance Professionals, Institutes Custom Publishing

- Assignment 1 (Contract Law: Insurance Applications)

Commentary on Question:

This question tested a candidate's understanding of insurance contract law.

Solution

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

Any contract in which one party must either accept the agreement as written by the other party or reject it.

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

Commentary on Question:

There are more than four other special characteristics identified in the syllabus reading. Only four were required for full credit. The model solution is an example of a full credit solution.

- They are conditional
- They are contracts of utmost good faith
- They involve fortuitous events and the exchange of unequal amounts
- They are contracts of indemnity

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

Commentary on Question:

The model solution is based on selecting the first two characteristics identified in the model solution for part (b).

- Conditional: whether the insurer pays a claim depends on whether a covered loss has occurred.
- Utmost good faith: Both parties to the contract are expected to be honest and forthcoming in their dealings with each other.

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

- A statement is made that is false or misleading.
- The statement relates to a material fact.
- The insurer relies on the statement in issuing the policy.

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

False representation involves a lack of intent to deceive whereas fraud involves the intent to deceive.

GIFREU, Spring 2022, Q19

GI 201 LO2

Learning Objectives:
2. The candidate will understand the regulatory environment for general insurance.

Learning Outcomes:
(2e) Describe the development of general insurance programs controlled by government or collective insurance industry organizations and their mechanisms of operation.

Sources:
Government Provision of General Insurance, SOA

Commentary on Question:
This question tested a candidate's knowledge of the government provision of insurance for several lines of business in the United States and Canada. The model solution is an example of a full credit solution.

Solution:
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

(i) Workers compensation (WC)

In the United States, WC is provided by the private sector. However, the residual market is provided by the government in some states. In Canada, WC is entirely provided by the provincial governments.

(ii) Automobile insurance

In the United States, automobile insurance is provided by the private sector. In Canada, some provinces have a government insurer providing the insurance whereas other provinces are served by the private sector. One province has split coverage in which the government provides bodily injury coverage, and the private sector provides physical damage coverage.

(iii) Homeowners insurance

Both the United States and Canada make use of the private sector for homeowners insurance. However, in the United States, the federal government provides coverage for some risks (e.g., flood insurance through the NFIP) and some state governments provide coverage for some risks (e.g., earthquake in California).

(iv) Agriculture insurance

In the United States and Canada, all-risk agriculture coverage is provided by the government while other types (e.g., crop) are provided by the private sector.

GIFREU, Fall 2022, Q3

GI 201 LO3

Learning Objectives:

3. The candidate will understand tort law and insurance law with respect to general insurance.

Learning Outcomes:

(3a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

Sources:

Excerpts from Business Law for Insurance Professionals, Institutes Custom Publishing

- Assignment 1 (Contract Law: Insurance Applications)

Commentary on Question:

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

Solution:

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

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

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

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

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

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

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

Commentary on Question:

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

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

GIFREU, Fall 2022, Q6

GI 201 LO3

Learning Objectives:

3. The candidate will be able to understand tort law and insurance law with respect to general insurance.

Learning Outcomes:

(3e) Understand the reasons for the use of no-fault insurance for some general insurance lines of business.

Sources:

Government Provision of General Insurance, SOA

Commentary on Question:

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

Solution:

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

Commentary on Question:

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

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

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

Commentary on Question:

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

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

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

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

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

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

GIFREU, Fall 2022, Q8

GI 201 LO2

Parts (d) and (e) not in GI 201

Learning Objectives:

2. The candidate will understand the regulatory environment for general insurance.

Learning Outcomes:

(4c) Compare different forms of rate regulation.

Sources:

The General Insurance Regulatory Environment, SOA

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

- Chapter 12 (Solvency Monitoring)

Commentary on Question:

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

Solution:

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

Commentary on Question:

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

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

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

Commentary on Question:

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

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

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

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

Compare the sufficiency of funding under these two methods.

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

Risk-based pre-funding:

- The guaranty fund may become be excessive through an extended period without any insolvency.

Post-insolvency funding:

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

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

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

Not in 201

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

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

Not in 201

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

GIFREU, Fall 2022, Q15

GI 201 LO6

Learning Objectives:

6. The candidate will understand the analysis of a general insurer's financial health.

Learning Outcomes:

(6f) Discuss the function of credit rating agencies and their influence on general insurers.

Sources:

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

- Chapter 13 (General Insurance Financial Ratings)

Commentary on Question:

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

Solution:

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

Commentary on Question:

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

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

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

Commentary on Question:

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

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

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

(i) Reinsurance contracts

(ii) Surety insurance contracts

(iii) Homeowners insurance contracts

(iv) Structured settlements

Commentary on Question:

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

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

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

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

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

GIFREU, Fall 2022, Q16

GI 201 LO3

Learning Objectives:

3. The candidate will understand tort law and insurance law with respect to general insurance.

Learning Outcomes:

(3a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.
(3j) Describe and interpret legal cases/issues included in the syllabus resources.

Sources:

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

Tort Law: Topics for General Insurance Actuaries, SOA

Commentary on Question:

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

Solution:

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

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

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

State three of these five factors.

Commentary on Question:

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

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

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

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

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

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

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

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

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

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

GIFREU, Spring 2023, Q2

GI 201 LO6

Learning Objectives:

6. The candidate will understand the analysis of a general insurer's financial health.

Learning Outcomes:

(6f) Discuss the function of credit rating agencies and their influence on general insurers.

Sources:

General Insurance Financial Reporting Topics, 5th Ed. (2021), Society of Actuaries

- Chapter 13 (General Insurance Financial Ratings)

Commentary on Question:

This question tested a candidate's understanding of the effect financial ratings have on general insurers and their actuaries.

Solution:

(a) Identify three other key roles insurance company actuaries play in rating agency meetings.

Commentary on Question:

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

- Demonstrating loss reserve adequacy.
- Identifying and describing pricing strategy.
- Providing sensitive, confidential data related to the insurer's solvency risks.

(b) Identify two types of insurance contracts where financial ratings are particularly important.

Commentary on Question:

There are more than two types. The model solution is an example of a full credit solution.

- Reinsurance
- Homeowners insurance

(c) Describe how financial ratings are key considerations in the two types of insurance contracts identified in (b).

Commentary on Question:

The model solution is an example of a full credit solution based on the model solution provided for part (b).

- Reinsurance: The primary insurer can use the reinsurer's rating as one tool to assess the financial strength of the reinsurer.
- Homeowners insurance: Banks may require homeowners to obtain insurance coverage from insurers with strong financial ratings as a condition to obtain a mortgage.

(d) Identify four key qualitative attributes for which ABC management should be prepared to answer questions in this meeting.

Commentary on Question:
There are more than four key qualitative attributes. The model solution is an example of a full credit solution.

- Management structure
- Underwriting strategy
- Capital structure
- Acquisitions

GIFREU, Fall 2023, Q3

GI 201 LO6

Learning Objectives:

6. The candidate will understand the analysis of a general insurer's financial health.

Learning Outcomes:

(6a) Demonstrate knowledge of the various considerations for performance measurement of a general insurer.

Sources:

General Insurance Financial Reporting Topics, 5th Ed. (2021), Society of Actuaries

- Chapter 10 (Performance Measurement for General Insurers)

Commentary on Question:

This question tested a candidate's understanding of performance measurement for general insurance companies.

Solution:

(a) Describe three such factors.

Commentary on Question:

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

- Income taxes are levied on the legal entity, not the block of business.
- Income taxes may be computed in different ways (e.g., regular income tax versus alternative minimum income tax).
- Taxes include payments for past years' business, while expected taxes paid in future years that relate to business written in the current year should be accrued to current profit.

(b) Under U.S. statutory accounting, the use of operating income for retrospective performance measurement has two main drawbacks.

State these two drawbacks.

- There is a mismatch of underwriting income with investment income.
- Operating income mixes investment risks with underwriting risks.

(c) Explain why the allocation of equity by line of business for a general insurance company is often regarded as being arbitrary.

A general insurer's total equity supports the entire entity including all lines of business combined. There exists no single proper basis for an allocation. Many different methods exist that have both strengths and weaknesses.

(d) Insurers may use risk capital as a measure of equity in an ROE calculation as an alternative to using actual equity. There are several alternatives for risk capital that an insurer may use in an ROE calculation.

Identify two such alternatives.

Commentary on Question:
There are more than two alternatives. The model solution is an example of a full credit solution.

- Regulatory required capital based upon risk.
- Economic capital based upon an internal model of risk.

GIFREU, Spring 2024, Q1

GI 201 LO6

Learning Objectives:

6. The candidate will understand the analysis of a general insurer's financial health.

Learning Outcomes:

(6d) Demonstrate knowledge of the EU Solvency II capital requirement.

Sources:

General Insurance Financial Reporting Topics, 5th Ed. (2021), Society of Actuaries

- Chapter 12 (Solvency Monitoring)

Commentary on Question:

This question tested understanding of Solvency II capital requirements and the use of internal capital models.

Solution:

(a) Describe the purpose of each of the three pillars of Solvency II.

- Pillar 1: To provide the quantitative measurement of capital requirements.
- Pillar 2: To provide the governance and risk-management requirements of insurers, and the standards for effective supervision.
- Pillar 3: To provide the supervisory reporting, transparency and public disclosure reporting requirements.

(b) Describe the following for each of SCR and MCR:

(i) The level of required capital

(ii) The regulatory response if actual capital falls below that level of required capital

(i) The level of required capital
- SCR: 99.5% VaR over a one-year time interval
- MCR: 85% VaR, subject to the constraint that it is between 25% and 45% of the SCR

(ii) The regulatory response if actual capital falls below that level of required capital
- SCR: The regulator must take corrective action to restore the insurer's capital back to the SCR.
- MCR: The regulator will instigate liquidation of the insurer.

(c) Describe the two other IAIS recommended tests.

- Statistical quality test in which insurers must demonstrate that the model assumptions are justified and that the model parameters are correctly estimated.
- Operational use test in which insurers are required to demonstrate that the model is embedded in its risk strategy and operations.

GIFREU, Spring 2024, Q7

GI 201 LO5

Learning Objectives:

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

Learning Outcomes:

(5c) Understand the different financial reporting standards for general insurers

(5e) Understand the reporting of financial instruments.

Sources:

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

- Chapter 3 (Accounting for Financial Instruments)

Commentary on Question:

This question tested a candidate's knowledge of different accounting standards for investments in bonds.

Solution:

(a) Describe how *declared status at purchase* (e.g., available for sale, hold to maturity) affects the carrying value of a bond under each of the following accounting systems:

(i) International Financial Reporting Standards (IFRS)

(ii) U.S. Statutory Accounting Principles (SAP)

(iii) U.S. Generally Accepted Accounting Principles (GAAP)

Commentary on Question:

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

(i) IFRS: available for sale is at fair value, hold to maturity is at amortized cost

(ii) SAP: not affected

(iii) GAAP: available for sale is at fair value, hold to maturity is at amortized cost

(b) Describe how *bond grade* (e.g., investment grade, below investment grade) affects the carrying value of a bond under each of the following accounting systems:

(i) IFRS

(ii) SAP

(iii) GAAP

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

(i) IFRS: not affected
(ii) SAP: : investment grade at amortized cost, below investment grade at lower of amortized cost and fair value
(iii) GAAP: not affected

(c) Describe how changes in the market value of *available-for-sale investment grade bonds*, stemming from interest rate changes, are reported under each of the following accounting systems:

(i) IFRS

(ii) SAP

(iii) GAAP

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

(i) IFRS: profit or loss on the income statement
(ii) SAP: not reported as it is valued at amortized cost
(iii) GAAP: unrealized capital gains and losses

(d) Describe the economic condition that causes a bond's amortized cost to be greater than its fair value.

Commentary on Question:
There are several economic conditions that can cause this. The model solution is an example of a full credit solution.

A rising interest rate environment.

(e) Describe how the following affects the income statement under SAP:

(i) Decrease in market value for an impaired bond

(ii) Subsequent recovery of decrease in market value for an impaired bond

(i) It affects the SAP income statement because SAP reports this decrease as a realized capital loss.
(ii) It does not affect the SAP income statement because this subsequent recovery is not recognized under SAP.

GIFREU, Fall 2024, Q1

GI 201 LO5

Learning Objectives:

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

Learning Outcomes:

(5c) Understand the different financial reporting standards for general insurers

(5e) Understand the reporting of financial instruments.

Sources:

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

- Chapter 3 (Accounting for Financial Instruments)

Commentary on Question:

This question tested a candidate's knowledge of different accounting standards for investments in bonds.

Solution:

(a) Contrast attributes of the fair value versus the amortized cost of an asset.

Commentary on Question:

A complete solution needed to contrast at least two attributes. The model solution is an example of a full credit solution. It does not contrast all attributes.

Fair value is transparent in that it's easy for users to understand that it is the market value. In contrast, amortized cost is opaque in that most users don't know the purchase price and the amortization schedules, so they have difficulty understanding it.

Fair value is consistent in that the same asset will have the same value for all insurers. In contrast, amortized cost is entity specific dependent on the timing of the purchase and the interest rate at the time of purchase.

(b) Describe two conditions whereby debt securities may be held at amortized cost under IFRS.

- Assets are intended to be held to collect contractual cash flows.
- The contractual cash flows consist of repayment of principal and payment of interest on principal.

(c) Describe two conditions whereby the change in fair value of an asset may be treated as comprehensive income under IFRS

The assets are held to collect the contractual cash flows, consisting of repayment of principal and payment of interest on principal, and be available for sale at fair value.

GIFREU, Spring 2024, Q4

GI 201 LO7

Learning Objectives:

7. The candidate will understand the standards of practice and professionalism required of the actuary.

Learning Outcomes:

(7d) Describe and apply the concept of materiality.

Sources:

IAA Risk Book: Materiality, Proportionality and Similar Terms, Insurance Regulation Committee, International Actuarial Association

Commentary on Question:

This question tested a candidate's understanding of materiality

Solution:

(a) Describe the concept of materiality regarding actuarial work.

Commentary on Question:

There are several different reasonable descriptions. Only one is included in the model solution. The model solution is an example of a full credit solution.

An omission, understatement or overstatement in a work product is material if it is likely to affect the intended principal user's decision-making.

(b) Explain why the selection of a materiality standard for an actuarial opinion should or should not be influenced by how close an insurer is to the minimum capital requirement.

Commentary on Question:

The model solution is an example of a full credit solution. Other reasonable responses were accepted for full credit.

Selection of a materiality standard is influenced by this because going below the minimum capital requirement has consequences affecting the intended principal user's decision making.

(c) Explain why the selection of a materiality standard for an actuarial opinion should or should not be influenced by the degree of uncertainty in the provision for insurance liabilities.

Commentary on Question:

The model solution is an example of a full credit solution. Other reasonable responses were accepted for full credit.

Selection of a materiality standard should generally not be influenced by this. This is because uncertainty in estimates does not justify a raising or lowering of the materiality standard. It is a risk-based concept that is different from the concept of materiality. It should not change the amount by which an error or omission would change the user's decision making.

(d) Describe two considerations that could influence if this error is material.

Commentary on Question:
There are more than two considerations. The model solution is an example of a full credit solution.

- Whether or not correction of the error would result in a change to a regulatory test of financial condition.
- The purpose of the estimate (e.g., reserve opinion, financial reporting, or internal forecasting).

GIFREU, Fall 2024, Q13

GI 201 LO7 Parts (c) and (d) not in GI 201

Learning Objectives:

7. The candidate will understand the standards of practice and professionalism required of the actuary.

Learning Outcomes:

(7c) Demonstrate knowledge of the general insurance actuarial opinion and the role of the appointed actuary.

Sources:

General Insurance Financial Reporting Topics, Fifth Edition (2021), Society of Actuaries

- Chapter 14 (The General Insurance Actuarial Opinion)

Commentary on Question:

This question tested a candidate's understanding of issues regarding the Appointed Actuary and the provision of an actuarial opinion.

Solution:

(a) Compare the use of internal appointed actuaries (AAs) versus external AAs with respect to independence.

Commentary on Question:

Widely varying correct responses are possible. The model solution is an example of a full credit solution.

It is generally believed that external actuaries may be more independent than internal actuaries for actuarial opinions. While internal actuaries may face job pressures to agree with the company's senior management, external actuaries may also face pressure to agree with clients to retain their business.

(b) Identify two each for the following:

(i) Primary intended users

(ii) Secondary intended users

Commentary on Question:

There are more than two secondary intended users. The model solution is an example of a full credit solution.

(i) Regulators and the insurer's Board of Directors

(ii) Insurer's senior management and rating agencies

~~(c) State the two conditions for a contract to be categorized as a long-duration contract.~~

Not in GI 201

- ~~The contract term is greater than or equal to thirteen months; and~~
- ~~The insurer can neither cancel the contract nor increase the premium during the contract term.~~

~~(d) If the AA issues a qualified SAO for a U.S general insurer, four disclosures specific to a qualified opinion are required.~~

~~Describe these four required disclosures.~~

Not in GI 201

- ~~The item (or items) to which the qualification relates.~~
- ~~The reasons for the qualification.~~
- ~~The amounts for such items, if disclosed by the entity, that are included in the reserve. If the amounts for such items are not disclosed by the entity, the actuary should disclose that the reserve includes unknown amounts for such items.~~
- ~~The actuary should disclose whether the reserve amount makes a reasonable provision for the liabilities associated with the specified reserves, except for the item or items to which the qualification relates.~~

GIADV, Fall 2020, Q2

GI 201 LO4

Learning Objectives:

4. The candidate will understand elements of financial economics relevant to general insurance.

Learning Outcomes:

(4c) Calculate an underwriting profit margin using different models under a financial economics approach.

Sources:

Ratemaking: A Financial Economics Approach, D'Arcy and Dyer

Commentary on Question:

This question required the candidate to respond in Excel. An example of a full credit solution is in the Excel solutions spreadsheet. The solution in this file is for explanatory purposes only.

Solution:

(a) Calculate the funds generating coefficient estimate, *k*.

Calculated as the sum of the "Percentage of the Insurer's Business for each Group" times the "Average Time Between Receipt of Premium and Payment of Losses and Expenses" for each Group.

$40\% \times 0.9 + 35\% \times 1.2 + 25\% \times 1.5 = 1.155$

(b) Calculate the underwriting beta.

Calculated as k, from part (a), times the liability beta times −1.

$1.155 \times -0.2 \times -1 = 0.231$

(c) Calculate the underwriting profit margin ignoring taxes.

The underwriting profit margin (UPM) is calculated as k, from part (a), times the risk-free rate times −1 plus the underwriting beta (β_u), from part (b), times the difference between the expected return on the market portfolio ($E(R_m)$)and the risk-free rate (R_f).

$\text{UPM} = (1.155 \times 2\% \times -1) + (0.231 \times (10\% - 2\%)) = -0.46\%$

(d) Calculate the underwriting profit margin using the version of CAPM that accounts for taxes.

First one needs to calculate the tax rate on investment income, TA, which is the sum of the Percentage of Total Assets for each asset type times the tax rate for each asset type.

Let T = tax rate on underwriting income and S/P = equity to premium ratio.

Then the underwriting profit margin UPM =
$-k \times R_f \times (1 - \text{TA})/(1 - \text{T}) + \beta_u \times [\text{E}(R_m) - R_f] + (\text{S/P}) \times R_f \times \text{TA}/(1 - \text{T})$.

TA = 20% × 0% + 30% × 10% + 50% × 30% = 18%
UPM = −1.155 × 2% × (1 − 0.18) / (1 − 0.3) + 0.231 × (10% – 2%) +
(1/2) × 2% × 0.18 / (1 − 0.3)

UPM = −0.60%

GIADV, Spring 2021, Q2

GI 201 LO4

Learning Objectives:

4. The candidate will understand elements of financial economics relevant to general insurance.

Learning Outcomes:

(4c) Calculate an underwriting profit margin using different models under a financial economics approach.

Sources:

Ratemaking: A Financial Economics Approach, D'Arcy and Dyer

Commentary on Question:

This question required the candidate to respond in Excel for parts (b) and (c). An example of a full credit solution for these parts is in the Excel solutions spreadsheet. The model solutions in this file for parts (b) and (c) are for explanatory purposes only.

Solution:

(a) Describe the problem with the IRR method.

The IRR equation is solved by trial and error. However, if the cash flows change sign more than once, then multiple solutions for the IRR can occur.

(b) You are calculating the underwriting profit margin (UPM) for a one-year policy using the Risk Adjusted Discount Technique with the following assumptions:

- The premium will be collected at policy inception.
- Expenses of 24 will be paid as follows:
  - 35% paid six months before policy inception; and
  - 65% paid at policy inception.
- Losses are expected to be 120 and will be paid as follows:
  - 40% paid nine months after policy inception; and
  - 60% paid at policy expiration.
- The tax rate on all income is 25% and taxes will be paid at policy expiration.
- Equity of 90 supports the policy from policy inception to policy expiration.
- The risk-free rate is 3.4%.
- The risk-adjusted rate for losses is 0.6%.

Calculate the premium for this policy.

Commentary on Question:
In this solution, the following abbreviations are used:

- PV = present value
- L = losses
- E = expenses
- C = equity
- TUW = tax on underwriting income
- TII = tax on investment income

The question did not state whether or not discounting was required for tax purposes. As such, the tax on underwriting income could be based on either undiscounted or discounted amounts. The model solution presented here assumes that the tax is on undiscounted underwriting income.

$P = PV(E) + PV(L) + PV(TUW) + PV(TII)$
$PV(E) = 24 \times (0.35 / 1.034^{-0.5} + 0.65) = 24.1416$
$PV(L) = 120 \times (0.4 / 1.006^{0.75} + 0.6 / 1.006) = 119.3557$
$PV(TUW) = (0.25)(P – E) / 1.034 – (0.25) L / 1.006 = 0.2418P – 35.6238$
$PV(TII) = (C + P – E – (0.4)L / 4)(0.034)(0.25) / 1.034 = 0.0082P + 0.4439$
$P = 108.3174 + 0.25P$
$\rightarrow P = 144.42$

(c) Calculate the UPM for this policy.

$UPM = 1 – L/P – E/P$
$UPM = 1 – 120 / 144.42 – 24 / 144.42 = 0.00291 = 0.291\%$

GIADV, Fall 2021, Q2

GI 201 LO4

Learning Objectives:

4. The candidate will understand elements of financial economics relevant to general insurance.

Learning Outcomes:

(4c) Calculate an underwriting profit margin using different models under a financial economics approach.

Sources:

Ratemaking: A Financial Economics Approach, D'Arcy and Dyer

Commentary on Question:

This question required the candidate to respond in Excel. An example of a full credit solution is in the Excel solutions spreadsheet. The solution in this file is for explanatory purposes only.

Solution:

(a) Calculate the target total rate of return.

Target total rate of return (TRR) = Risk-free rate + Insurer's beta × Market risk premium
= 2% + 1.4 × 5% = 9.0%

(b) Calculate the underwriting profit margin.

Investable assets = IA, Owner's equity = S, Insurer's investment return = IR, Premium = P and Underwriting profit margin = UPM

TRR = (IA / S) × IR + (P / S) × UPM

UPM = (S / P) × (TRR − (IA / S) × IR)
= (500,000 / 900,000) × (9.0% − (1,200,000 / 500.000) × 6.0%)
= −3.0%

(c) Identify three differences in how Fairley's model determines *UPM* compared to the Target Total Rate of Return model.

- Fairley assumes insurers will earn the risk-free rate.
- Fairley employs the underwriting beta rather than a beta relating to company equity.
- Fairley recognizes the lag between receipt of premiums and the payment of losses and expenses.

GIADV, Spring 2022, Q2

GI 201 LO4

Learning Objectives:

4. The candidate will understand elements of financial economics relevant to general insurance.

Learning Outcomes:

(4c) Calculate an underwriting profit margin using different models under a financial economics approach.

Sources:

Ratemaking: A Financial Economics Approach, D'Arcy and Dyer

Commentary on Question:

This question required the candidate to respond in Excel for parts (c), (d) and (e). An example of a full credit solution for these parts is in the Excel solutions spreadsheet. The solution in this file for parts (c), (d) and (e) is for explanatory purposes only.

Solution:

(a) Define "Risk Adjusted" in the context of the Risk Adjusted Discount Technique.

The interest rate used for discounting accounts for the degree of risk in the given cash flow.

(b) State the discount rate (risk-free or risk-adjusted) that should be used with each cash flow.

P: risk-free
E: risk-free
L: risk-adjusted
S: risk-free

(c) The equation for the premium is PV(P) = PV(L) + PV(E) + PV(TUW) + PV(TII).

Calculate each of these five values using a trial premium of 150.

Commentary on Question:

PV(cash flow) is the present value of the cash flow, r_F is the risk-free rate and r_A is the risk-adjusted rate.

For P = 150:
PV(P) = P / (1 + r_F)^(1/12) = 150 / 1.042^(1/12) = 149.48661
PV(L) = L / (1 + r_A) = 120 / 1.016 = 118.11024
PV(E) = E = 24
PV(TUW) = [(P – E) t / (1 + r_F)] – [L × t / (1 + r_A)] = 0.70277
PV(TII) = (S + P – E) r_F t / (1 + r_F) = 2.17658

(d) Calculate the premium for this policy. (Note: Using Excel's Goal Seek function is an acceptable approach.)

Commentary on Question:
This question could be answered using one of three approaches: solving for P from the formulas, using Goal Seek so the difference between PV(P) and PV(L) + PV(E) + PV(TUW) + PV(TII) is zero by adjusting P, or using trial and error instead of Goal Seek. The model solution in the Excel solutions spreadsheet used Excel's Goal Seek function. The model solution in this document used the direct solving for P approach.

PV(P) = 0.99658P
PV(L) = 118.11024
PV(E) = 24
PV(TUW) = 0.23992P – 35.28572
PV(TII) = 0.01008P + 0.66507
PV(P) = PV(L) + PV(E) + PV(TUW) + PV(TII) so we have
0.74658P = 107.48959
P = 143.97649

(e) Calculate the UPM for this policy.

UPM = 1 – (L + E) / P = –0.00016

GIADV, Fall 2022, Q2

GI 201 LO4

Learning Objectives:

4. The candidate will understand elements of financial economics relevant to general insurance.

Learning Outcomes:

(4c) Calculate an underwriting profit margin using different models under a financial economics approach.

Sources:

Ratemaking: A Financial Economics Approach, D'Arcy and Dyer

Commentary on Question:

This question required the candidate to respond in Excel for parts (b), (c) and (d). An example of a full credit solution for these parts is in the Excel solutions spreadsheet. The solution in this file for parts (b), (c) and (d) is for explanatory purposes only.

Solution:

(a) Describe two methods for obtaining the underwriting beta.

Method 1: Perform a regression of historical underwriting returns against the returns of the market portfolio.

Method 2: Determine the liability beta and then multiply it by $-k$, where k is the funds generating coefficient.

(b) Calculate the funds generating coefficient estimate, k.

The estimate of k is the sum, over the payment pattern groups, of the product of the percentage of business in the group times the average time between receipt of premium and payment of losses and expenses. $k = 1.03$.

(c) Calculate the UPM ignoring taxes.

UPM = $-k$ × risk-free rate + UW beta × (expected return on the market portfolio – risk-free rate) = −0.86%

(d) Calculate the UPM accounting for taxes.

Average tax rate on investment income (TA) equals 16% which is the sum, over the asset types, percentage of assets in the asset type times the tax rate for the asset type.

UPM = $-k$ × risk-free rate × (1 − TA) / (1 − tax rate on underwriting income) + underwriting beta × (expected return on the market portfolio − risk-free rate) + (1 / ratio of premium to owner's equity) × risk-free rate × TA / (1 − tax rate on underwriting income) = −0.89%.