CASUALTY ACTUARIAL SOCIETY
AND THE
CANADIAN INSTITUTE OF ACTUARIES

Virginia R. Prevosto
Vice President-Admissions

Steven D. Armstrong
Chairperson
Examination Committee

William Wilder
Assistant Chairperson
Examination Committee

Exam 6-Canada

Regulation and Financial Reporting
(Nation Specific)

Examination Committee
General Officers
Kevin Kesby
Jason Russ
Jeremy Shoemaker
Thomas Struppeck
Glenn Walker
Rhonda Walker
Geoffrey Werner
Arlene Woodruff

October 31, 2012

4 HOURS

INSTRUCTIONS TO CANDIDATES

1. This 79.5 point examination consists of 37 problem and essay questions.

2. For problem and essay questions, the number of points for each full question and part of a question is indicated at the beginning of the question or part. Answer these questions on the lined sheets provided in your Examination Envelope. Use dark pencil or ink. Do not use multiple colors.

   - Write your Candidate ID number and the examination number, 6C, at the top of each answer sheet. Your name, or any other identifying mark, must not appear.
   - Do not answer more than one question on a single sheet of paper. Write only on the front lined side of the paper – **DO NOT WRITE ON THE BACK OF THE PAPER.** Be careful to give the number of the question you are answering on each sheet. If your response cannot be confined to one page, please use additional sheets of paper as necessary. Clearly mark the question number on each page of the response in addition to using a label such as "Page 1 of 2" on the first sheet of paper and then "Page 2 of 2" on the second sheet of paper.
   - The answer should be concise and confined to the question as posed. When a specified number of items are requested, do not offer more items than requested. For example, if you are requested to provide three items, only the first three responses will be graded.
   - In order to receive full credit or to maximize partial credit on mathematical and computational questions, you must clearly outline your approach in either verbal or mathematical form, showing calculations where necessary. Also, you must clearly specify any additional assumptions you have made to answer the question.

3. Do all problems until you reach the last page of the examination where "END OF EXAMINATION" is marked.

   All questions should be answered according to the Canadian statutory accounting practices and principles, unless specifically instructed otherwise. SAP refers to Statutory Accounting Principles, and GAAP refers to Generally Accepted Accounting Principles.

CONTINUE TO NEXT PAGE OF INSTRUCTIONS

4. Prior to the start of the exam you will have a **fifteen-minute reading period** in which you can silently read the questions and check the exam booklet for missing or defective pages. A chart indicating the point value for each question is attached to the back of the examination. Writing will NOT be permitted during this time and you will not be permitted to hold pens or pencils. You will also not be allowed to use calculators. The supervisor has additional exams for those candidates who have defective exam booklets.

5. Your Examination Envelope is pre-labeled with your Candidate ID number, name, exam number and test center. Do not remove this label. Keep a record of your Candidate ID number for future inquiries regarding this exam.

6. Candidates must remain in the examination center until two hours after the start of the examination. The examination starts after the reading period is complete. You may leave the examination room to use the restroom with permission from the supervisor. To avoid excessive noise during the end of the examination, candidates may not leave the exam room during the last fifteen minutes of the examination.

7. At the end of the examination, place all answer sheets in the Examination Envelope. Please insert your answer sheets in your envelope in question number order. Insert a numbered page for each question, even if you have not attempted to answer that question. Nothing written in the examination booklet will be graded. Only the answer sheets will be graded. Also place any included reference materials in the Examination Envelope. BEFORE YOU TURN THE EXAMINATION ENVELOPE IN TO THE SUPERVISOR, BE SURE TO SIGN IT IN THE SPACE PROVIDED ABOVE THE CUT-OUT WINDOW.

8. If you have brought a self-addressed, stamped envelope, you may put the examination booklet and scrap paper inside and submit it separately to the supervisor. It will be mailed to you. Do not put the self-addressed stamped envelope inside the Examination Envelope.

   If you do not have a self-addressed, stamped envelope, please place the examination booklet in the Examination Envelope and seal the envelope. You may not take it with you. Do not put scrap paper in the Examination Envelope. The supervisor will collect your scrap paper.

   Candidates may obtain a copy of the examination from the CAS Web Site.

   All extra answer sheets, scrap paper, etc. must be returned to the supervisor for disposal.

9. Candidates must not give or receive assistance of any kind during the examination. Any cheating, any attempt to cheat, assisting others to cheat, or participating therein, or other improper conduct will result in the Casualty Actuarial Society and the Canadian Institute of Actuaries disqualifying the candidate's paper, and such other disciplinary action as may be deemed appropriate within the guidelines of the CAS Policy on Examination Discipline.

10. The exam survey is available on the CAS Web Site in the "Admissions/Exams" section. Please submit your survey by November 15, 2012.

END OF INSTRUCTIONS

EXAM 6 – CANADA, FALL 2012

1. (2 points)

   a. (1 point)

      An insurance company incorporated in Alberta is seeking to expand operations into Nova Scotia. Discuss the impact of the decision reached in the case known as "The Insurance Reference Case" (*The Attorney-General for Canada v. The Attorney-General for Alberta*) on this proposed expansion.

   b. (1 point)

      Describe two areas of concern of federal legislation addressing an insurance company's financial soundness.

CONTINUED ON NEXT PAGE

2. (1.5 points)

In the case of *Citizens Insurance Co. v. Parsons*, an insurance company challenged the validity of The Fire Insurance Policy Act.

a. (1 point)

Identify two reasons why the insurance company argued that the Fire Insurance Policy Act was *ultra vires*.

b. (0.25 point)

Briefly describe how the Privy Council interpreted "trade and commerce" when ruling on this case.

c. (0.25 point)

Briefly describe the Privy Council's ruling on this case.

CONTINUED ON NEXT PAGE

3. (1.5 points)

   a. (0.5 point)

      Briefly describe two uses of credit-based insurance scores.

   b. (1 point)

      An insurance regulator has questioned using credit-based insurance scores on the grounds that an economic crisis could adversely affect policyholders. Describe two arguments that can be used by a company that uses credit-based insurance scores to defend its position to the regulator.

CONTINUED ON NEXT PAGE

4. (1.75 points)

Various forms of automobile rate regulation exist in Canada.

a. (0.75 point)

Briefly describe each of the following forms of rate regulation:
   i. File and use
   ii. Use and file
   iii. Prior approval

b. (1 point)

A province is considering changing from a prior approval system to a use and file system. Briefly describe four ways in which this change could benefit the province's policyholders.

CONTINUED ON NEXT PAGE

5. (2 points)

   a. (1 point)

      Describe two recommendations suggested by the Crawford Report that were relevant to the evolution of the actuarial role.

   b. (1 point)

      Describe two changes made to the Insurance Companies Act in the early 1990s as a result of numerous insurance company failures in the early 1980s.

CONTINUED ON NEXT PAGE

6. (2 points)

According to the Office of the Superintendent of Financial Institutions (OSFI) paper "Key Principles for the Future Direction of the Canadian Regulatory Capital Framework for P&C Insurance":

a. (1.5 points)

Identify and discuss the two approaches described in the framework for determining regulatory capital requirements.

b. (0.5 point)

Explain which approach identified in part a. above is more suitable for a small regional insurer.

CONTINUED ON NEXT PAGE

7. (2 points)

In a series of decisions rendered in 1978, commonly referred to as the Trilogy, the Supreme Court of Canada established a cap on non-pecuniary damages.

a. (1.5 points)

Describe three justifications presented by the Court for establishing the cap.

b. (0.5 point)

Describe how the cap affects the level of equity in compensation between people with temporary or less severe injuries and those with permanent and more severe injuries.

CONTINUED ON NEXT PAGE

8. (1.5 points)

   In the case of *Amos v. Insurance Corporation of British Columbia*, Mr. Amos was shot and seriously injured by a gang who surrounded his car while he was driving in California. The Supreme Court of Canada was asked to rule whether the resulting injury was covered under his automobile policy.

   a. (0.5 point)

      Identify the two questions the Supreme Court of Canada considered in reaching a verdict.

   b. (0.5 point)

      Discuss the Court decision and its rationale.

   c. (0.5 point)

      Discuss the applicability of the decision to automobile policies issued in Ontario.

CONTINUED ON NEXT PAGE

9. (1.25 points)

   In 2004, legislation was introduced in Alberta to address concerns from insurers and the public about the rising costs of motor vehicle insurance and an increase in uninsured drivers. The case *Morrow v. Zhang* challenged portions of the new legislation.

   a. (0.5 point)

      Describe the facts of the case.

   b. (0.5 point)

      Describe the outcome of the initial trial and the reason behind the decision.

   c. (0.25 point)

      Briefly describe the outcome of the appeal.

CONTINUED ON NEXT PAGE

10. (1 point)

A large shopping mall has a general liability insurance policy with a limit of $5 million. A customer slipped in the mall, severely damaged his spine and then sued the mall for negligence. Before the trial, the customer's lawyer offered to settle for $4 million, an offer the insurance company declined. At trial, the jury awarded the customer $7 million.

The shopping mall then sued the insurance company to recover the $2 million by which the jury's award exceeded the policy limit. Based on Canadian case law, describe the expected ruling and the reasons for this conclusion. Cite any relevant cases to support your position.

CONTINUED ON NEXT PAGE

11. (1.75 points)

The American Tort Reform Association (ATRA) has made a number of recommendations for the reform of punitive damage awards.

a. (0.5 point)

Define punitive damages and briefly discuss their purpose.

b. (0.5 point)

Identify two issues that led to the recommendations.

c. (0.75 point)

Briefly describe three of the recommended reforms.

CONTINUED ON NEXT PAGE

12. (1.5 points)

a. (0.5 point)

Describe the legal doctrine of Joint and Several Liability.

b. (0.5 point)

Discuss how this doctrine may increase efficiency in the legal system.

c. (0.5 point)

A criticism of the Joint and Several Liability doctrine is that lawyers may search for "deep pockets" to sue. Briefly describe two reforms that have been proposed to address this concern.

CONTINUED ON NEXT PAGE

13. (4.25 points)

a. (1 point)

Identify four reasons for government participation in insurance.

b. (1 point)

For each reason identified in part a. above, provide an example of a government insurance program.

c. (0.75 point)

Identify three criteria for evaluating the performance of the government in providing insurance.

d. (1.5 points)

Evaluate the Terrorism Risk and Insurance Act (TRIA) using each of the criteria identified in part c. above.

CONTINUED ON NEXT PAGE

14. (1.75 points)

a. (0.5 point)

Briefly describe the purpose of each of the following Agricultural Policy Framework programs.

i. Production Insurance
ii. Canadian Agricultural Income Stabilization

b. (0.5 point)

For each program listed in part a. above, identify one peril covered by the program.

c. (0.75 point)

Two types of production insurance plans are:

- individual yield programs
- area-based or collective protection plans

i. Evaluate which plan provides a stronger link between a given farm's total production and the compensation to which that farm is entitled.

ii. Briefly identify two reasons to support your answer in part i. above.

CONTINUED ON NEXT PAGE

15. (1.5 points)

a. (0.5 point)

Briefly describe two objectives of Employment Insurance (EI).

b. (0.5 point)

Explain how the EI program is financed.

c. (0.5 point)

Briefly describe the tax treatment of EI with respect to premiums and benefits.

CONTINUED ON NEXT PAGE

16. (2.5 points)

a. (0.50 point)

Explain why flood insurance has not yet been offered by private insurers to Canadian homeowners as an optional product.

b. (0.25 point)

Identify one way to make it feasible to offer flood insurance in Canada.

c. (0.75 point)

Briefly describe the desired characteristics of each element below that would ensure the economic viability of a flood program in Canada

i. Rates
ii. Deductibles
iii. Eligibility

d. (0.75 point)

Briefly explain why each characteristic mentioned in part c. above is desirable.

e. (0.25 point)

Provide one argument against a government-run flood insurance program.

CONTINUED ON NEXT PAGE

17. (1.75 points)

The Property and Casualty Insurance Compensation Corporation (PACICC) is designed to provide recovery to policyholders when an insurer doing business in Canada fails. Since its inception in 1988, it has successfully managed several such failures.

a. (1 point)

Insurers that failed in the past were relatively small. Considering the consolidation and growth of the P&C insurance market, evaluate whether PACICC is well positioned financially to handle insurer insolvencies in the future.

b. (0.75 point)

Other than company size, briefly describe three common characteristics of insolvent companies.

CONTINUED ON NEXT PAGE

18. (1.25 points)

Briefly explain whether each of the following risks is eligible to be ceded to its respective provincial risk sharing pool.

a. (0.25 point)

A motorcycle with a Third Party Liability limit of $1 million and standard deductibles, written in Ontario.

b. (0.25 point)

A motorcycle with a Third Party Liability limit of $2 million and standard deductibles, written in Quebec.

c. (0.25 point)

A private passenger vehicle with a Third Party Liability limit of $500,000 and standard deductibles, written in Quebec. As the broker knew the insured personally, the insured received a special discount of 10% off the standard manual rate.

d. (0.25 point)

A private passenger vehicle with a Third Party Liability limit of $200,000 and standard deductibles, written in Ontario. This vehicle is only used in summer and is stored from October to April each year.

e. (0.25 point)

A private passenger vehicle with a Third Party Liability limit of $100,000 and standard deductibles, written in Quebec.

CONTINUED ON NEXT PAGE

19. (2 points)

The philosophy of "injury insurance" is based on the social view that injured people should be assisted and their losses compensated regardless of who may have been at fault.

a. (0.5 point)

Briefly describe two criticisms of injury insurance.

b. (1 point)

Briefly describe four benefits of injury insurance over liability insurance.

c. (0.5 point)

Briefly describe two thresholds for combined injury and liability insurance.

CONTINUED ON NEXT PAGE

20. (1.75 points)

An insurer became insolvent on April 1, 2012. Calculate the amount each of the following insureds would receive from the PACICC plan.

a. (0.75 point)

Paul's vehicle has been insured for the past five years. His last claim of $500 occurred four years ago and was paid in full by the insurer. The annual premium for his one-year policy that began on October 1, 2011 is $2,200.

b. (1 point)

Mary had a homeowner's policy with a $5,000 deductible. The annual premium on her one-year policy effective February 1, 2012 was $450. A fire on March 14, 2012 caused $315,000 of damage. To date, the insurer has not made any payments.

CONTINUED ON NEXT PAGE

21. (4.5 points)

The following financial information is available for an insurance company as at December 31, 2011. The company has no subsidiaries.

MCT Ratio	192%
Return on GAAP Equity	6.2%
Net Loss Reserves to Equity	185%
Return on Revenue	1.0%
One-Year Development to Equity	-3.5%
Overall Net Leverage	430%
Return on Assets after Tax	3.5%
AOCI to Equity	10%
Cash Flow from Operations to Net Premiums Written	-1.8%
Reinsurance Recoverables to Equity	6.5%
Net Underwriting Leverage Ratio	210%
Overall Diversification Score	56

a. (3 points)

Using three relevant ratios from the information given above, evaluate the profitability of the insurance company for 2011. In your evaluation, include a comparison to benchmark values as well as the insight that the ratios give to the underlying balance sheet and/or income statement accounts.

b. (0.75 point)

Given that the ratio of gross premiums written to net premiums earned is 1.1, calculate the insurance return on net premium earned.

c. (0.75 point)

Calculate the ratio of net claims liabilities to total liabilities.

CONTINUED ON NEXT PAGE

22. (4 points)

The following is a partially completed Unpaid Claims and Loss Ratio Analysis Exhibit for an insurance company as at December 31, 2011.

Accident Year (1)	Paid Loss Cumulative (3)	Total Undiscounted Unpaid Claims and Adjustment Expense (6)	Present Value of Unpaid Claims and Adjustment Expenses – Total (7)	PfAD Claims (8)	PfAD Reinsurance (10)	PfAD Interest Rate (11)
2010	4,200	1,400	1,379	138	0	3
2011	1,200	1,800	?	?	0	?

Accident Year (1)	Discounted Reserves including PfAD (12)	Earned Premiums (13)	Investment Income from UPR (14)	Cumulative Investment Income from Unpaid Claim Reserve (15)	Loss Ratio Undiscounted (16)	Loss Ratio Discounted (17)
2010	1,521	6,000	25	75	?	?
2011	?	5,000	14	?	?	?

Additional information is also available:

- Discount rate: 3%
- Provision for adverse deviations (PfAD)
  - PfAD interest rate: 0.5%
  - PfAD development: 10.0%
- Ceded reinsurance: none
- Investment yield for 2011: 4%
- Unpaid claims liabilities on page 20.20 as at December 31, 2011: $3,750
- Unpaid claims liabilities on page 20.20 are greater than the actuary's best estimate
- Tax rate: 36%
- Cumulative accident year payment pattern:
  - Percentage paid by 12 months: 40%
  - Percentage paid by 24 months: 75%
  - Percentage paid by 36 months: 100%
- Assume that all payments are made in the middle of the year.

<< QUESTION 22 CONTINUED ON NEXT PAGE >>

(22 cont.)

a. (1.5 points)

Calculate the unpaid claims liability according to accepted actuarial practice for accident year 2011.

b. (1 point)

Calculate the undiscounted loss ratio and the discounted loss ratio for accident year 2011.

c. (1 point)

Calculate the estimated effect of discounting the asset for future income taxes.

d. (0.5 point)

Describe how the nature of the income tax deduction on an insurer's claims liabilities leads to an asset for future income taxes.

CONTINUED ON NEXT PAGE

23. (1.5 points)

The following insurance company information is available from the December 31, 2011 P&C-1 page 60.41. The company began writing insurance in 2009.

		2009	2009 & prior	2010	2010 & prior	2011	2011 & prior
2009	Paid during year	1,995	1,995				
	UCAE, end of year	1,488	1,488				
	IBNR, end of year	869	869				
	Investment Income from UCAE and IBNR						
	Ratio: Excess (deficiency)						
2010	Paid during year	580	580	2,600	3,180		
	UCAE, end of year	1,164	1,164	2,207	3,372		
	IBNR, end of year	736	736	1,319	2,055		
	Investment Income from UCAE and IBNR		?				
	Ratio: Excess (deficiency)		**A**				
2011	Paid during year	750	750	740	1,490	2,740	4,230
	UCAE, end of year	677	677	1,684	2,361	2,369	4,731
	IBNR, end of year	489	489	1,053	1,542	1,447	2,989
	Investment Income from UCAE and IBNR		?				
	Ratio: Excess (deficiency)		**B**				

Investment yield for 2010: 4.00%
Investment yield for 2011: 3.75%

Solve for A and B.

CONTINUED ON NEXT PAGE

24. (2.5 points)

An insurance company's Minimum Capital Test (MCT) ratio is currently at the supervisory target. Company management is concerned with possible regulator action if the MCT ratio were to decrease.

Management has proposed a potentially profitable expansion into a commercial general liability market. Details of the proposal include:

- A significant increase in gross written premium.
- An expected profit of 10% of the premium written on the new business.
- Claims on the new business are expected to be fully paid after five years.
- Only 10% of an accident's year's claims will be paid at 12 months.
- Cash from the new premiums will be primarily invested in long-term investment-grade bonds and common shares.

a. (2 points)

Assuming that the company decides to pursue the expansion in the commercial general liability market, identify the effect it will have on any four balance sheet accounts which are impacted and the implication on the MCT ratio for each balance sheet account selected.

b. (0.5 point)

Management would like to pursue the expansion, but is concerned about a likely decrease to the MCT ratio. Propose an adjustment to the expansion plan or to the company's business processes that could keep the MCT from decreasing.

CONTINUED ON NEXT PAGE

25. (2 points)

An insurer has designated all of its fixed income investments as available-for-sale.

Assuming that there is an increase in the market interest rate, indicate whether each of the following Annual Return components would increase or decrease. Briefly describe your reasoning for each answer.

a. (0.5 point)

Balance sheet total assets

b. (0.5 point)

Balance sheet total liabilities

c. (0.5 point)

Income statement net income

d. (0.5 point)

Other comprehensive income

CONTINUED ON NEXT PAGE

26. (4 points)

A property and casualty company is determining whether it has a premium deficiency. The following information is available as at December 31, 2011. All amounts are in thousands of dollars ($000s).

Line of Business	Net Unearned Premium ($000s)	Net Undiscounted Loss Ratio	Net Claim Development MfAD	Net Discount Factor Excluding Margins	Net Discount Factor Including Interest Rate Margin	Discounted Loss Ratio including margins at accident date	Discounted Loss Ratio including margins at evaluation date
Property	20,000	75.0%	5%	0.95	0.96	76.4%	74.8%
Liability	15,000	70.0%	10%	0.83	0.86	X	Y

For both lines of business:

Reinsurance Margin for Adverse Deviations (MfAD)	3%
Ratio of expected ceded claims to net unearned premium reserve	30%
Percentage of unearned premium in invested assets	70%
Discount factor from the average accident date to the evaluation date	0.97
Selected maintenance expense ratio	4%
Selected internal adjustment expense ratio	12%

For the insurance company as a whole:

Deferred Policy Acquisition Expenses ($000s)	6,000
Contingent Commissions (discounted with margins) ($000s)	500

a. (1.5 points)

For the liability line, calculate X and Y.

b. (2 points)

Calculate the DPAE that will be booked in the balance sheet.

c. (0.5 point)

Describe the circumstances under which a company must book a premium deficiency reserve.

CONTINUED ON NEXT PAGE

27. (4.25 points)

The following information is available from the December 31, 2011 P&C-1 of an insurance company. All amounts are in thousands of dollars ($000s).

Liabilities and Equity (Page 20.20)

	($000s)
Shares Issued and Paid	50,000
Contributed Surplus	20,000
Retained Earnings	5,000
Reserves	1,000
Accumulated Other Comprehensive Income (Loss)	5,000

Minimum Capital Test (Page 30.70)

Capital Available	($000s)
Total Equity less Accumulated Other Comprehensive Income	?
Subordinated Indebtedness and Redeemable Preferred shares	1,000
Accumulated Other Comprehensive Income (Loss) on:	
Available for Sale Equity Securities	2,000
Available for Sale Debt Securities	2,000
Foreign Currency (Net of Hedging Activities)	1,000
Assets with a Capital Requirement of 100% (includes the amount calculated for unregistered reinsurers on page 70.38)	500
Capital Required	($000s)
Balance Sheet Assets	20,000
Unearned Premiums/Unpaid Claims/Premium Deficiencies	?
Reinsurance Ceded to Unregistered Insurers	?
Structured Settlements, Letters of Credit, Derivatives and Other Exposures	10

Assume that the values of any page 30.70 line not shown above are equal to 0.

Reinsurance Ceded to Unregistered Reinsurers (Page 70.38)

Name of Assuming Reinsurer	Unearned Premium Ceded to Assuming Insurer ($000s)	Outstanding Losses Recoverable from Assuming Insurer ($000s)	Receivable from Assuming Insurer ($000s)	Payable to Assuming Insurer ($000s)	Non-owned Deposits Held as Security from Assuming Insurer ($000s)	Letters of Credit Held as Security from Assuming Insurer ($000s)
ABC Re	500	1,000	250	0	2,000	250
XYZ Re	2,000	2,500	0	3,500	500	0

<< QUESTION 27 CONTINUED ON NEXT PAGE >>

(27 cont.)

Line Specific Information

Line of business	Net Written Premium ($000s)	Net Unearned Premium ($000s)	Net Unpaid Loss ($000s)	Margin on unearned premium	Margin on unpaid claims
Auto – liability & personal accident	52,000	25,000	25,000	8%	10%
Auto – other	30,000	17,000	4,000	8%	5%

Other Information

- Based on the Appointed Actuary's analysis, there is no premium deficiency.
- The company has determined that the Minimum Gross Capital Level test is not relevant.
- The company's internal Minimum Capital Test (MCT) target is 200%.

Calculate the MCT ratio and briefly describe any actions the company should take based on this result.

CONTINUED ON NEXT PAGE

28. (2.5 points)

a. (1.5 points)

According to OSFI Guideline E-18, "Stress Testing: Sound Business and Financial Practices", describe three purposes that an institution's stress testing program should serve.

b. (1 point)

With respect to stress testing programs, identify two responsibilities of senior management and two responsibilities of the board.

CONTINUED ON NEXT PAGE

29. (2.5 points)

The following table shows projections from the Dynamic Capital Adequacy Testing (DCAT) of three Canadian property and casualty insurance companies as at December 31, 2011. All amounts are in thousands of dollars ($000s).

		December 31, 2012		December 31, 2013	
		Equity ($000s)	MCT %	Equity ($000s)	MCT %
Company A	Base Scenario	20,000	175%	17,500	160%
	Adverse Scenario	16,000	95%	15,000	115%
Company B	Base Scenario	20,000	175%	17,500	145%
	Adverse Scenario	5,000	30%	-400	-10%
Company C	Base Scenario	20,000	175%	9,500	90%
	Adverse Scenario	6,000	80%	5,000	40%

a. (1.5 points)

Determine whether or not each company is in "satisfactory financial condition". Briefly justify each answer.

b. (0.5 point)

Briefly describe two reasons a company's internal target capital ratio should be higher than the supervisory target.

c. (0.5 point)

Assume Company A has an internal target capital ratio of 170%. Explain the requirements for additional disclosure to OSFI.

CONTINUED ON NEXT PAGE

30. (2.25 points)

In "Fair Value of Claims Liabilities", Cheng mentions three major risks that actuaries should consider when selecting the provision for adverse deviations (PfAD) for the discount rate.

a. (1.5 points)

Describe each of the following three major risks Cheng identified:

i. Credit risk
ii. Interest rate risk
iii. Timing risk

b. (0.75 point)

Based on the following information, calculate the interest rate risk according to Cheng's methodology.

Liability	$500
Invested Assets	$750
Asset Duration	3.25 years
Liability Duration	2.75 years
Anticipated Change in Interest Rates	100 basis points

CONTINUED ON NEXT PAGE

31. (2 points)

The Property and Casualty Minimum Capital Test Advisory Committee has outlined a vision for new principles-based solvency financial requirements. Insurers that choose to develop models will calculate their regulatory asset requirement on two bases, at a target level (i.e., regulatory target asset requirement or TAR) and at a minimum level (i.e., regulatory minimum asset requirement or MAR).

a. (1.5 points)

Briefly describe the following for both TAR and MAR:

i. Purpose of the requirement
ii. Use of standard versus internal models
iii. Sufficiency level

b. (0.5 point)

Define "terminal provision".

CONTINUED ON NEXT PAGE

32. (2.25 points)

The following information is available for a Canadian property and casualty insurance company for accident year 2000 as at December 31, 2011.

Undiscounted unpaid liability	$1,000
Present value of unpaid liability	$937
Provision for adverse deviation	$23

The following additional information is also available.

Income tax rate	40%
After tax discount rate	5%

a. (0.5 point)

Define "ambivalence point".

b. (1.25 points)

Calculate the ambivalence point and comment on how it is affected by tax.

c. (0.5 point)

Given that the company successfully commutes the unpaid loss above, discuss how the seller's actuary and the buyer's actuary should adjust their data going forward when they perform their respective IBNR analyses.

CONTINUED ON NEXT PAGE

33. (1 point)

Describe the requirements common to both GAAP and SAP for determining the existence of risk transfer in a reinsurance transaction.

CONTINUED ON NEXT PAGE

34. (3 points)

The Appointed Actuary of a primary insurance company is valuing policy liabilities as at December 31, 2011. The report date for the year-end 2011 financial statements is February 22, 2012.

For each scenario below identify if the event is a subsequent event or not, and support your conclusion. Fully explain how the Appointed Actuary should take the event into account.

a. (1 point)

A material catastrophic event occurs on January 10, 2012.

b. (1 point)

The Appointed Actuary receives notice on January 5 that the December 31 database being used to perform the year-end policy liabilities valuation does not include data for a material amount of claims that occurred on December 29.

c. (1 point)

The company cedes a material level of policy liabilities to a particular reinsurance company. Due to a gradual deterioration in financial condition this reinsurance company fails on January 10. The Appointed Actuary becomes aware of the failure on January 11.

CONTINUED ON NEXT PAGE

35. (1.5 points)

a. (0.5 point)

Describe the requirement regarding disclosure of concentrations of insurance risk in property and casualty insurers' financial statements.

b. (0.5 point)

Identify two pieces of information that an insurer can use to respond to the requirement described in part a. above.

c. (0.5 point)

Identify two considerations in determining the concentration risk.

CONTINUED ON NEXT PAGE

36. (1.75 points)

According to the Insurance Companies Act:

a. (0.75 point)

Identify three duties of the audit committee of an insurance company.

b. (1 point)

Describe the reporting requirements of the Appointed Actuary to:

i. The board of directors
ii. The chief executive officer

CONTINUED ON NEXT PAGE

37. (1.5 points)

OSFI Guideline E-15, "Appointed Actuary: Legal Requirements, Qualifications and External Review" sets out OSFI's expectations with respect to external review of the Appointed Actuary's work and reports. Describe three functions the external reviewer is expected to perform for property and casualty insurers.

END OF EXAMINATION

Exam – 6C

QUESTION		POINT VALUE OF QUESTIONS		(a)	(b)	(c)	(d)	(e)	(f)	(g)	
1		2.00		1.00	1.00						
2		1.50		1.00	0.25	0.25					
3		1.50		0.50	1.00						
4		1.75		0.75	1.00						
5		2.00		1.00	1.00						
6		2.00		1.50	0.50						
7		2.00		1.50	0.50						
8		1.50		0.50	0.50	0.50					
9		1.25		0.50	0.50	0.25					
10		1.00		1.00							
11		1.75		0.50	0.50	0.75					
12		1.50		0.50	0.50	0.50					
13		4.25		1.00	1.00	0.75	1.50				
14		1.75		0.50	0.50	0.75					
15		1.50		0.50	0.50	0.50					
16		2.50		0.50	0.25	0.75	0.75	0.25			
17		1.75		1.00	0.75						
18		1.25		0.25	0.25	0.25	0.25	0.25			
19		2.00		0.50	1.00	0.50					
20		1.75		0.75	1.00						
21		4.50		3.00	0.75	0.75					
22		4.00		1.50	1.00	1.00	0.50				
23		1.50		1.50							
24		2.50		2.00	0.50						
25		2.00		0.50	0.50	0.50	0.50				
26		4.00		1.50	2.00	0.50					
27		4.25		4.25							
28		2.50		1.50	1.00						
29		2.50		1.50	0.50	0.50					
30		2.25		1.50	0.75						
31		2.00		1.50	0.50						
32		2.25		0.50	1.25	0.50					
33		1.00		1.00							
34		3.00		1.00	1.00	1.00					
35		1.50		0.50	0.50	0.50					
36		1.75		0.75	1.00						
37		1.50		1.50							
TOTAL		79.50									

Exam 6-Canada, Fall 2012

Answer keys and sample answers

The **Answer key** is intended to document the majority of answers that were given credit during grading however, some points may be missing from the key. The **Actual candidate answer for full marks** is a sample answer from a candidate that received full credit for the question. The actual candidate answer for each question was often selected randomly from papers that received full credit and is not representative of the "best" answer, just a "full credit" answer. The **Examiner's report** for each question is a narrative on each question completed by the graders of the question. The purpose of the examiner's report is to provide insight into where points were achieved and where points were commonly missed by the candidates to assist candidates who sat for the exam as well as candidates preparing for future exams.

Examiner's report – general comments

Over the past two years, the exam committee has noticed that a much higher proportion of candidates were unprepared for Exam 6-Canada than in the past and received fairly low scores. We are assuming that many of the candidates who received low scores were first-time writers of the written-answer type of examination. The exam committee would like to emphasize that students should prepare for the exam by studying the readings cited in the syllabus. Although review of old exam questions is encouraged by the exam committee, total reliance on old questions will most likely not result in a passing score as the syllabus is extensive and changes from year to year. Often, topics that have not been tested before and new topics will appear on the exam.

Candidates should keep in mind that Exam 6-Canada is a requirement for P&C actuaries who wish to obtain their Fellowship in the Canadian Institute of Actuaries and legally sign opinions as an actuary in Canada. Thus, the depth of knowledge required for passing the exam is related to the knowledge required by a practicing actuary in Canada. Some topics on the syllabus require P&C actuaries to have only a broad knowledge of while other topics are "must-know" topics of P&C actuaries. The score required to pass each question, the "minimally qualified candidate score" (MQC score), is heavily based on the exam committee's view of the depth of knowledge required by a qualified Canadian actuary on the topic.

In particular, the exam committee believes the knowledge required by a qualified Canadian P&C actuary on Section B (Government and Industry Insurance Programs) is fairly superficial. Students should have a broad understanding of the programs offered concentrating on the Knowledge Statements listed in the syllabus. In line with the objective of a broad understanding, the MQC score required by candidates was set at a lower level. Overall, on the 2012 exam, candidates greatly exceeded the knowledge required to pass Section B topics.

Most of Section C (Financial Reporting) is core knowledge required by P&C actuaries in Canada. Candidates are expected to understand the Canadian financial statements and be able to complete most calculations listed in the Knowledge Statements section of the syllabus. In general, passing and many borderline candidates met the MQC score requirements for this section of the syllabus. Candidates should note that the “answer” is almost never worth more than a quarter point and thus, candidates in danger of not finishing the exam should not waste time attempting to ensure they have calculated the “right” answer.

On the opposite end of the spectrum from Section B is Section D (Professional Responsibilities of the Actuary in Financial Reporting). This section focuses on the professional responsibilities of the appointed actuary in Canada and contains extremely important knowledge for Canadian P&C actuaries. This importance leads to a fairly high MQC score compared to the level required by Section B. In general, candidates did very poorly on this section and are therefore, encouraged to review Section D topics in more depth. The fact that these topics are at the end of the syllabus and are tested in the last section of the exam does not make knowledge less important.

Section A (Regulation of Insurance and Canadian Insurance Law) questions were fairly well completed except those on the Landmark Legal reading which were generally more poorly answered.

In summary, candidates are encouraged to think about the importance of each Learning Objective on the syllabus to the work of a P&C actuary in Canada. All Learning Objectives are not equal in importance and students should concentrate their study efforts on the more important topics.

Question 1

Answer key:

a) An insurance company incorporated in one province could carry on business in another province without being regulated by the Federal Government. A company incorporated by a province with provincial objects was not restricted to carrying on business in only one province but could operate in other provinces with permission from those provinces.

b)
- Conditions that must be satisfied for a company to enter into the business of insurance
- Reports relating to the financial condition of the company that must be submitted at regular intervals
- Control over the investments, calculation of asset values and policy reserves
- Protecting the interests of policyholders in areas other than those related to the control of insurance
- (Any two of the above)

Other answers accepted by graders (important areas of concern for OSFI were accepted as valid answers – several candidates answered these):
- *Minimum capital requirements (or minimum MCT)*
- *DCAT, stress testing*
- *Earthquake reserves*

Actual candidate answer for full marks:

a)

In The Insurance Reference case, it is ruled that the provincial government has the power to regulating insurance companies.

As long as the NS government allows the company incorporated in Alberta can expand to Nova Scotia.

b)
1. it requires periodic reporting of the financial conditions of the company
2. control of investment, calculation of assets and claim liabilities

Examiner's report:

a. Candidates generally performed "okay" for this question when in reality they should have probably done much better. The answers are quite easy, and it is question of knowing this or not. A number of candidates confused being regulated by the Federal Government with being incorporated federally.

b. Candidates exhibited a variety of answers, some of which recurrent, and deemed acceptable by the graders. Just as was the case for a), the graders' feeling is that candidates could have performed better on this question: The first two items in the grading key are fairly obvious answers.

Question 2

Answer key:

a) Both of:
   - Subject matter related to regulation of trade and commerce which is a federal jurisdiction
   - Province cannot legislate so as to deprive a federal incorporated company of its status and capacity

b) Privy Council interpreted "Trade and Commerce" as <u>inter-provincial trade and commerce</u> rather than regulation of a particular business carried in a single province

c) Privy Council found the Act to be intra vires.

Actual candidate answer for full marks:

a) i) insurance related to "trade & commerce" which is federally regulated, so province cannot pass such an Act

   ii) province cannot act to diminish status & capacity of a British or foreign insurer

b) meant "interprovincial" trade & commerce, not "int<u>ra</u>provincial"

c) Ontario's act was <u>intra vires</u>

Examiner's report:

Candidates performed generally well for this question, especially given the fact that this material is not as key as other material. Common mistakes/omissions were related to the second point of part A (province cannot legislate…): a large number of candidates simply did not mention this, while quite a few others tried to articulate this point but failed to do so in a complete manner, making the grading exercise more complex. Most candidates did fairly well on the notion of trade and commerce being interpreted at inter-provincial trade and commerce, and also with respect to the intra vires verdict. Overall, candidates seemed to have a pretty good grasp/understanding of what this court case is about as well as its associated ramifications.

Question 3

Answer key:

a) Briefly describe two uses of credit-based insurance scores.

- Determine whether an insured qualifies to be written by the company
- Segment risks into different groups with similar expected costs for the purpose of rating, risk classification, risk tiering
- Risk Sharing Pool or Residual Market assignation

b)

- Since much of an insurer's business is likely to be renewal business, even if the economic crisis caused a dramatic distributional shift in credit scores the overall impact would have been minor since capping and other factors would have mitigated the impact since credit scores are just one variable in rating.
- An insurer which uses credit-based insurance scores might see a decline in overall scores leading to an increase in average rates. However assuming that the overall rates are actuarially sound, this increase should be adjusted through off-balancing therefore not increasing total premiums collected.

**** Similar answers were accepted*

Actual candidate answer for full marks:

a) → to segment the risk e.g. risk classification factor or tier factor
→ to determine whether the risk is good to be underwrote by the company

b) → In economic crisis, every policyholder would be affected the same way, the relative between different group might not be affected.
→ Credit score is used to determine rate relativity but not overall rate level, so in the economic crisis, the overall rate level will not be affected.
→ If there is shifted in credit score, it seems to be a common practice to insurance company by self correcting using rate differentials.

Examiner's report:

Part A was answered much better than part B. On part B participants sometimes answered on credit scoring in general and did not mention in terms of the economic crisis.

Question 4

Answer key:

a)

i. File & Use: Insurers file rates with the regulatory authority and after some defined period of time, rates are "deemed" to be approved
ii. Use & File: Insurers file rate structures with the regulatory authority but may begin using the new rates immediately.
iii. Prior Approval: Strict form of rate price regulation where regulatory authority must approve rates before they can be used.

b)

i. Use & file rate regulation decreases volatility in insurance premiums compared to a prior approval system
ii. Use & file systems have <u>less regulatory costs</u> thereby decreasing insurance premiums compared to a prior approval system
iii. Lack of regulatory lag compared to prior approval system reduces the magnitude and frequency of price swings thereby causing less uncertainty for consumers.
iv. Use & file systems have smaller residual markets than prior approval states
v. Will likely lead to a larger number of insurers therefore providing more choice to consumers.
vi. More refined classification or rating algorithm or innovation
vii. Regulators have more time to focus on solvency or market conduct

Actual candidate answer for full marks:

a) i) File-and-use: rate level and risk classification must be filed with regulator a certain period of time before being used

ii) Use-and-file: rate level and risk classification may be used as soon as possible and must be filed within a stated period of time

iii) Prior approval: rate level and risk classification system must be filed an approved before being used

b) –Rates would be more adequate a insurer can adapt to changing condition more rapidly.

–Rates would be lower as insurer would incur lower cost for rate filing process.

–This increased competition environment would increase availability of automobile insurance

–This competitive environment would stimulate innovation and policyholders would have improve choice of coverage

Examiner's report:

Overall parts A and B were well answered. However, on part B candidates sometimes gave nearly identical responses for the four ways. Furthermore candidates also thought that Use and File would lower costs vs. Prior Approval insurance without giving valid details on why.

Question 5

Answer key:

a) 2 of the following

i. the CIA to give precedence to service in the public interest over self-interest of the member
ii. the CIA to increase its support of research and development for P&C insurance, develop standards of practice for this area, and increase its contribution to basic and continuing education for its students and members on these topics (any one of the listed)
iii. the CIA to improve and expand its contribution to the development and direction of public policy issues in Canada

b) 2 of the following

i. surplus test provisions were strengthened by providing for minimums based on written premiums and incurred claims and existing margins on reserves

ii. regulations were issued to address the excessive use of reinsurance and the use of unregistered reinsurance
iii. actuarial certifications of the adequacy of outstanding claims and unearned premium provisions were required for all P&C insurance companies' annual statements
iv. The AA must report on the value of actuarial and other policy liabilities of the company at the end of the financial year according to generally accepted actuarial practice
v. The AA should report on the financial condition of the company, including the expected future financial condition of the company (commonly known as the report on dynamic capital adequacy testing, or DCAT report)
vi. The AA should report on any matters that have come to the actuary's attention, that, in the actuary's opinion, have material adverse effect on the financial position of the company and require rectification

Actual candidate answer for full marks:

a) –CIA mission: CIA holds the duty of profession to the public above its member

–CIA should increase the number of Property and Casualty actuaries and enhance their development. Furthermore, CIA should persuade P&C companies to sue actuaries as the Life insurance companies do.

b) –Address the excessive use of reinsurance and unregistered reinsurance companies

–Requiring companies to have certifications by the Appointed Actuary for the provisions of unearned premium reserve and unpaid claim liability on an annual statement starting from calendar year 1992.

Examiner's report:

Answers for parts A and parts B were sometimes inverted. B was answered better than part A, however there was confusion about what was actually changed in the Insurance Companies Act: PACICC not part of it, strengthening of capital requirements instead of implementation of them, similarly for financial reporting.

Question 6

Answer key:

a)

i. Standard approach where it is used by all companies to determine the company's minimum capital requirement and by companies without approval to use internal models to determine supervisory and company target required capital amounts
ii. Internal models approach , which is to be used by companies with approval to use internal models to determine supervisory and company target required capital amounts, subject to OSFI-defined floors.

b) Sample answer: As a small operation may have limited risk management and modelling personnel, the standard approach would seem to be a better alternative.

(Need to identify the standard approach as being better and provide a reason . Note that this question is not directly from any specific material on the syllabus, but it is an inference that candidates can make by reading this OSFI paper – having internal models is a huge economic and human capital investment and would most likely be a viable option for the larger insurance companies)

Actual candidate answer for full marks:

a) 1) Standard approach: A rules based approach used by companies to determine the minimum capital requirements and the target (solvency) capital requirement. All insurers use this approach for the minimum capital.

2)Internal model approach: An approach developped internally by each insurer to determine their target capital. The regulator must approve this approach based on individual insurer characteristics before they can use it. Otherwise, insurers will use the standard approach.

b) The Standard approach since the small insurer may not have enough resources to make its own internal model.

Examiner's report:

Part B was answered well even if part A did not contain the correct answer. For part A candidates often got confused answering as if it were Solvency 2 instead of the OSFI framework.

Question 7

Answer key:

a.

3 of the below:

1) The claim of a severely injured person for damages for non-pecuniary loss is virtually limitless. The fact that there is no objective yardstick for measuring such loss leaves this area open to inconsistent and widely extravagant awards.

2) Damages for non-pecuniary losses are not really "compensatory" as no money can provide true restitution. Accordingly, such damages should be viewed as simply providing additional money to make life more endurable.

3) Under the law, the plaintiff will be fully compensated for future loss of income and future care costs which are arguably more important for ensuring that the injured person is well cared for in the future.

4) Exorbitant awards for general damages can lead to an excessive social burden (i.e. unaffordable increases in insurance and social costs).

b.

Relative to actual losses, the liability process tends to <u>over compensate people with temporary or less severe injuries and under compensate those with permanent and more severe injuries</u>. Particularly in recent years, this trend has resulted from rapidly inflating and precedent-setting court awards for non-economic losses (called. "general damages" or pain and suffering) in cases of temporary soft-tissue injury. At the other end of the scale, such compensation in cases of more severe and damaging injury is capped both by the policy limits in effect and by an upper limit on general damages by the Supreme Court of Canada in 1978.

Actual candidate answer for full marks:

(a)

1) Non-pecuniary damages are not really meant to be compensatory as by nature they can't be. They are just meant to make life more bearable.

2) Not having a cap could lead to an excessive social burden. High awards could cause premiums for insurance to be high. Eventually, only the healthy may be able to afford to drive.

3) Losses for medical expenses, wage loss, and lost wages are already required by law. These are the more important matters. The claimant must be well cared for.

(b) People with more severe injuries can argue that the benefits are not fair and those with less serious injuries can be fully compensated while they can't. The cap is constitutional and it is fair as the benefits are not meant to totally indemnity the injured person.

Examiner's report:

a. This was a fairly straight forward question that has been asked in the past. The paper clearly outlines the Supreme Court's justification for the cap in four points. Full marks required a demonstration of a strong understanding of three of the four arguments. Candidates generally answered this question well.

b. In general, candidates did well on this question. A common error was to answer that non-pecuniary damages are not intended to be compensatory, so compensation was equal between the two groups. Given the potential ambiguity of the wording of the questions, part marks were given for this response.

Question 8

Answer key:

a)

- Did the accident result from ordinary and well known activities to which automobiles are put?
- Is there some causal relationship between the injuries and the user or operation of the vehicle?

b) Is covered.
BC policies have the wording that policyholders are entitled to no-fault benefits for injuries "<u>that arise out of</u>" the ownership, use or operation of a vehicle.

c) Not necessary binding.
Ontario policies have the wording that policyholder are entitled to no-fault benefits for injuries "<u>caused by</u>" the ownership, use, or operation of a vehicle.

Actual candidate answer for full marks:

a) •The purpose test: Does the driver was using his car in a normal activity (normal use)
•The causality test: Does the link between the use of his care the shooting were related?

b) The driver was using his car in a normal use and there is a link between the use of his car and the shooting as to be entitled for no-fault benefit in BC, the damage must be "arising out" of the use & ownership of the car. Thus, he is entitled to recovery.

c) It is not applicable without another case as in ON, the words “caused by” are used instead of “arising out”. Thus, this ruling is not immediately applicable.

Examiner’s report:

a. This was a key aspect of the paper and in general candidates answered it well. Full marks required demonstration of a basic understanding of the two questions. One common mistake was to specify a direct causal relationship was required whena key aspect of the question was that the relationship was not required to be direct.

b. Candidates answered this question well. This has been asked in the past and was the key part of the paper.

c. Candidates generally answered this well. This question required the candidate to show an understanding of the broader consequences of this decision.

Question 9

Answer key:

a. Their trial for damages for their soft tissue injuries case challenged the constitutionality of the $4000 cap (in minor injuries).

b. -Found that the law <u>did discriminate</u> against those with minor injuries / found a violation of section 15 of the charter (alternatively, “<u>not constitutional</u>”?)
-Trial judge struck down the MIR

c. The cap was upheld.

Actual candidate answer for full marks:

a) –capped minor injuries at $4000 in an attempt to reduce coverage and therefore reduce premiums
-cap was challenged as the grounds of discrimination against individuals with minor injuries

b) Initial trial
-ruled cap as discriminatory against individuals with minor injuries
→removed the cap

c) Outcome of appeal
-cap is not discriminatory
→cap now stands and can no longer be appealed

Examiner’s report:

a. This is a key case which occurred very recently and was regarded as a critical part of the syllabus. Full marks required the mention of the challenge regarding the constitutionality of the case, or allegation the cap is discriminatory as well as reference to soft tissue or minor injuries.

b. The solution requires both the fact that the MIR was deemed unconstitutional or discriminatory, as well as the result – that the MIR was struck down.

c. The fact that the cap was upheld was required.

Question 10

Answer key:
The insurer will be found absolutely liable* for the amount exceeding the policy limit, since they had the opportunity to settle for less than this amount. This ruling will be based on the case of Dillon vs, Guardian Insurance Co.

* if absolute liability is not explicitly mentioned, arguments leading towards that legal doctrine should be (ex: mentioning "gambling" with the insured's money)

Other answers accepted by graders:
Alternative to "absolute liability":
"In the situation where the insurer's and insured's interests necessarily conflict, the insurer, which may reap the benefits of its determination not to settle, should also suffer the detriments of its decision."
Alternatives to "liable for the amount exceeding the policy limit":
1) The shopping mall will win the lawsuit.
2) The insurer will pay the $7 million.

Actual candidate answer for full marks:
relevant case to support position: Dillon vs. Guardian Insurance cie

the concept of absolute liab. state that an insurer should use reasonable care to settle within limits when he has the opportunity to do so. the insurance cie should have know that the case might exceed the limit due to his experience and knowledge. the insurer is found to breach that duty of care to the insured and must pay the xs damages.

Examiner's report:
This question covers key material in the graders mind (except maybe for knowing the name of the court case), and overall, candidates did very well on it. The answers provided to this question really indicated that candidates understood what this is about. "Absolute Liability" was mentioned by a few, but most candidates were able to explain the concept using other words or expressions, like gambling with the insured's money.

Question 11

Answer key:
a. Punitive Damages: damages awarded not to compensate a plaintiff but to punish a defendant for intentional or malicious misconduct and to deter similar future misconduct.
   Candidate does not have to specify "intentional or malicious misconduct" to receive full credit because it can be argued that this point is not part of either the definition or the purpose.

b.
  i. difficulty of predicting whether punitive damages will be awarded by a jury in any particular case
  ii. the marked trend toward astronomically large amounts when they are awarded

c. any 3 of below
  i. Establishing a liability "trigger" that reflects the intentional tort origins and quasi-criminal nature of punitive damages awards – "actual malice"
  ii. Requiring "clear and convincing evidence" to establish punitive damages liability
  iii. Requiring proportionality in punitive damages so that the punishment fits the offence
  iv. Enacting federal legislation to address the special problem of multiple punitive damages awards.

Actual candidate answer for full marks:

a) –awarded when malicious, outrageous conduct directed at victim

Purpose -punish wrongdoer
-deter " & others from similar future conduct
-retribution for victim

b)
i) awards exorbitantly high
ii) multiple punitive damage awards ("overkill" of awards)

c)
i) requiring a liability "trigger" reflecting quasi-criminal nature of misconduct
ii) require clear & convincing evidence of malicious misconduct warranting punitive damage
iii) damages awarded to be proportional to level misconduct

Examiner's report:

a. This is a foundational question, which has been asked numerous times. Full points required punish & deter. The graders allowed points for deterrence to society as well as deterrence to the defendant for future behavior as the paper did not clearly state the purpose of the deterrence.

b. Candidates could draw from many sources and various solutions were allowed.

c. There were four potential answers of which the candidate could pick any three.

Question 12

Answer key:

a.

Under the current joint and several legal doctrine, courts allow the plaintiff to recover <u>all of the damages from one of multiple wrongdoers</u>, <u>even if that party is only partially at-fault for the loss</u>.

b.

<u>It may promote settlement</u> owing to the fact that <u>if parties were going to pay damages on a proportional basis, there may be more trials</u>. This could increase costs and slow down the legal system.
-other reasonable answers are acceptable

c.
-RIMS supports the elimination of joint and several liability for all non-economic damages, such as pain and suffering and punitive damages as this would discourage plaintiffs and their counsel from approaching defendants on the 'deep pocket' syndrome.
-Amend it so that defendants pay damages in proportion to their contributory negligence.
-Create a fund to pay for these kinds of lawsuits, similar to PACICC

Actual candidate answer for full marks:

a) Law that says that a plaintiff can recover losses from multiple defendants collectively or from each defendant individually. Even if a defendant is only 5% liable, he/she may have to cover 100% of damages if other defendants can't contribute their part
b) Increases efficiency because it keeps the number of trials from being too high resulting in inefficiency. Lawyers only go to trial if believe can prove fully liable, so if only need to prove a % of liability a lot more lawyers would go to trial
c) –proportionality in awards based on fault
–barring rule for plaintiffs that are a certain % or less at fault

Examiner's report:

a. This was a foundational definition question. For full marks the graders required the candidate to specify that wrongdoers may be held fully liable even if they were only "partially at fault". Most candidates were able to obtain full marks.

b. It is important to note that this question pertains to efficiency in the legal system as a whole, not efficiency from the plaintiff's perspective. Many candidates focused only on the plaintiff and stated that the system is beneficial for the plaintiff as it allows the plaintiff to sue only one party. While this is true, it is not the correct answer, as it ignores the settlement process between defendants after the fact where at fault parties could be involved in further negotiations / suits.
The graders also gave part marks for "allows the victim full compensation". While this does not directly answer the question as written, part marks were allowed as this was noted as a benefit of Joint and Several in the Harris paper.

c. This question allowed the candidates several points to choose from. The graders also allowed "set a threshold for joint and several to apply" which, while not directly from the Harris paper was considered a valid answer from other sources.

Question 13

Answer key:

a)/b)
Any 4 of:

- Filling needs unmet by private insurance (examples: crop insurance, flood insurance, TRIA)
- Compulsory purchase of insurance (examples: workers compensation, auto liability in Quebec/Saskatchewan/Manitoba/BC)
- Convenience (examples: Florida Hurricane Catastrophe Fund, TRIA, flood insurance)
- Efficiency (examples: TRIA, government health insurance)
- Social Purposes (examples: workers compensation, social security)

c/d)
Any 3 of:

- Is provision of insurance by the government necessary? (Yes, because availability of terrorism insurance was reduced after 9/11 OR No, because public demand for terrorism insurance has been lower than expected)
- Is it insurance or social welfare? (Insurance, because insurers are reimbursed for a portion of their costs OR Social Welfare, because premiums are not paid until after a loss occurs)
- Is the program efficient? (Yes, because the government works in partnership with private insurers who already have claims handling infrastructure OR No, because there is concern about delays in certifying events)
- Is the program accepted by the public? (Yes, because terrorism insurance is required by commercial lenders, OR No, because demand for coverage has been lower than expected)

Actual candidate answer for full marks:

a) i) Fill need unmet by private ins.
ii) Compulsory nature ins.
iii) Convenience
iv) Social Purpose

b) i) US Flood
ii) WC
iii) Florida Hurricane Cat. Fund
iv) Social Security

c) i) does it fulfill social purpose or nec-ssry to fill need unmet by private ins.?
ii) is it social welfare or insurance?
iii) is it publicly accepted?

d) i) Yes, fills need unmet by private insurers (who thought the risk virtually uninsurable) & social purpose in that economic activity could be disrupted if no ins. available for construction projects, airports/ large properties req. insurance to continue operating, investments (asset backed securities) backed by assets that req. to be insured
ii) Not insurance really as insurers indemnified for their losses & pay no premium upfront.
iii) Small # commercial insureds purchasing this cover likely indicates lack of public acceptance

Examiner's report:

a)/b)
This question was generally well done. The open-ended nature of the question caused a wide variety of answers to be accepted. The most common errors in part b) were Facility Association Residual Market (this is not a government program) and Auto Insurance (this is not a government program in most jurisdictions – it was accepted only if the candidate's answer referred to a specific jurisdiction in which auto insurance is provided by the government).

c/d)
This question was generally well done. The open-ended nature of the question caused a wide variety of answers to be accepted. For d) partial credit was given for answers that were factually correct but not

relevant to the criteria given in c). Some responses to d) were not explained in enough detail to warrant full credit.

Question 14

Answer key:
a)
Production insurance – Manage production risks
CAIS – Mitigate income disruptions and promote long-term income stability

b)
Production insurance – any of flood, drought, hail, fire, wind, etc.
CAIS – any of market price changes, fuel cost increases, labour cost increases, etc.

c)
Individual yield uses offsetting production so it's based on the farm's total output instead of individual fields.
Area-based is based on the average production for the area so it's not based on the farm's actual production.
Therefore, individual yield has a stronger link.

Actual candidate answer for full marks:

a) i) Provide protection for uncontrollable production losses.
Manage the inherent production risk of the agricultural industry
ii)-Mitigate unforeseen income disruption
-Promote long-term income stability

b) i) Drought
ii) Price drops

c) ii)-Individual yield program based compensation on actual production at the farm's level for each commodity insured.
-Whereas area-based plans provide compensation to all producer of the area regardless of their actual production
i) individual yield program.

Examiner's report:
a)
This question was generally well done. The most common error was not being specific enough in the description of production insurance. It does not cover all risks inherent to the agricultural industry, only risks that are specific to the process of production.
b)
This question was generally well done. There were a large number of acceptable answers. The most common error was giving "increase in input costs" as an example for CAIS which was not specific enough to receive credit – a specific example of an input (fuel, labour, etc) was required.

c)
Most candidates correctly identified that area-based uses the average production for an area while individual yield uses the insured's farm only. Many candidates only received partial credit because they did not also identify that in the individual yield program, compensation is based on the farm's total output so better than expected production on some fields can offset worse than expected production on other fields.

Question 15

Answer key:
a)
- Employment Insurance provides individuals with temporary income replacement as a result of employment interruptions
- It promotes active re-employment assistance to help unemployed workers to find and create jobs

b)
- Contributions from employers and employees
- Some programs funded with general tax revenues

c) Any 2 of:
- EI premiums are a tax-deductible expense to the employer
- EI premiums paid by employers do not give rise to taxable income for the employee
- EI Premiums paid by employees receive tax credit
- EI benefits are taxable income for recipient

Actual candidate answer for full marks:
a.
1) provide temporary income replacement for those lost their jobs not from their own fault
2) encourage people to go back to the workforce. For example, some training programs are provided.

b. It is financed by employees, employer, and general revenue tax

c.
Premium paid by employers are tax-deductible expense.
Premium paid by employees can receive tax-credit
Benefits are taxable income.

Examiner's report:
a)
This question was generally well done. Some candidates gave two variations on the theme of "temporary income replacement as a result of employment interruptions" (such as job loss / disability / maternity) and did not mention re-employment assistance – these candidates received partial credit.

b)
Candidates were required to mention that contributions come from both employers and employees in order to receive credit. Many candidates correctly identified contributions from employers and employees but did not mention general tax revenues – these candidates received partial credit.

c)
This question was generally well done. Because the question was not specific in asking for two points, full credit was given for any response that contained two correct points, even if it also contained some incorrect points. The most common error was stating that “contributions are tax-deductible” without specifying whose contributions (employer’s or employee’s).

Question 16

Answer key:

a)

- Under an optional system, the barrier has been adverse selection. (Candidates not required to use the specific term “adverse selection” as long as they explain the concept.)
- Insurers may select against homeowners by only making the policy available in areas considered to be safe, OR homeowners may select against insurers by only buying the policy in areas they consider prone to flooding.
- Also accepted:
    - Insurers would not be able to offer affordable premiums, premiums would be too high
    - Homeowners may select against insurers by only buying the policy in areas they consider prone to flooding.

b)

- Include flood insurance (bundle it) into standard homeowner insurance policies

c)

- Rates : should be risk based (commensurate with the risk), not all the same
- Deductibles : Higher risks customers should be subject to higher deductibles
    - Could vary depending on area (higher risks)
- Eligibility : 1 of the 2 following
    - Some very high risk flood risk might be uninsurable (excluded)
    - The industry should strive to covers most homes

d)

- Risk based premium will ensure the program is sustainable
- High deductibles will serve as a deterrent to occupy flood risk are
- Eligibility : 1 of the 2 following
    - Disincentive for development/location in high flood risk
    - Reduce the burden on the insurance community after a large event
    - Help ensure that insurance coverage for low risk property owners remains affordable

  Also Accepted:
    - Fair
    - Reduce morale hazard
    - Will avoid adverse selection

e)

Against: government prescribed rates (uniform) might not encourage risk reducing behavior
Also Accepted:

- Private insurers are more efficient

- If government has a relief program flood prone areas will continue to be developed
- Will encourage you make less effort to control flood damages
- Government rates would be subsidized, some cross subsidy between low and high risk
- Could create a social burden
- Would not have claims settlement expertise
- Market would not be competitive

Actual candidate answer for full marks:

a) –Because it will create an antiselection, only people who need it will purchase the insurance. To pay for those damages, premiums would have to be very expensive.

b) To cover all types of flood and to adapt bounding approach (include to base coverage) to have higher penetration rates.

c) i. Risk base rates (actuarially sound)
ii. Presence of deductibles and variation of those with premium paid to encourage prevention behviour.
iii. Exclude high risk clients/areas (flood prone areas).

d) i. To have enough fund for compensations (and not subsidize)
ii. Encourage preventive behavior/awareness of the risk by the public.
iii. To maintain premiums affordable for low level risks

e) It is not actuarially sound (subsidizing by the government)

Examiner's report:
Common mistakes:

a) Because insureds assumed their HO policy included coverage (not logical since insurers knew it …)
Difficult to price (many risks are difficult to price are done nonetheless e.g., CN tower)

b) ok

c) Common mistake on deductibles: first portion of loss

d) Comment: The order of the points was not considered in grading.

e) Common mistake: private insurance is better … (not a sufficient answer)

Question 17

Answer key:

a) Need 4 to get full credit.
Possible arguments to support that PACCIC is in good financial position:
   - Because PACCIC could decide to make special assessment or increase the assessment rates
   - Because a small reserve already exist
   - Letter of credit
   - Acquiring firms usually have experienced management, so not as worrisome …
   - The plan only provides basic compensation only, not full
   - OSFI will allow only acquisitions that are "safe", will not jeopardize financial soundness
   - Canada less prone to catastrophe, ex: less hurricane and tornadoes than US (arguable)
   - Etc

Also Accepted:

- Less liability from unearned premium as policyholder pay monthly premium (less money owned by insurer that is due to policyholder)
- OSFI, MCT and other tests help reduce the likelihood of an insolvency, but if it happens, likely to be smaller
- PACCIC recover insurers assets when sold (liquidity risk)
- Access to subrogation (third party payer)

Possible arguments to support that PACCIC is not in good financial position:

- Because assessments rates are not high enough.
- The plan was initially designed to deal with a median insurer but the size has now increased
- Reserve is too small
- Top 10 insurers are now too big
- Etc

b) Any 3 of the following 6

- Ownership : 31% were subsidiaries or branches of a failed parent company
- Type of license : two-thirds were federally supervised
- Age : 28% of insolvent Canadian insurers operated for less than 10 years
- Growth :68 % experienced unusual growth in premiums
- Underwriting : 70% occurred in property and auto lines (type of business)

Also Accepted:

- Lack of internal controls
- Poor management/not very experienced management
- One or both of "Inadequate pricing and reserves "

Actual candidate answer for full marks:

a) No, the PACICC is not well positioned financial to handle future insolvencies because:

-the avg insurer has grown substantially
-general assessment that can be applied to members has a cpa
-compensation fund needs to increase
-needs to increase capital available to handle an insolvency quickly and fully

b) –rapid growth

-firms that grow too rapidly face threats of insolvency when UW cycle hits a soft market and profitability deteriorates

c)

–foreign parent

-Firms with foreign parents sometimes need to provide capital to the parent firms to offset their losses an provide policyholder dividends
-The capital strain from being responsible for a parent company's profitability could influence insolvency in secondary markets

–Years in business

-experience in the current industry and market greatly affects an insuers ability to make strategic and operational decisions

→the wrong decision can result in losses and insolvency

Examiner's report:

a. This is a question to evaluate a candidate ability to make a judgment. Therefore, many answers could be acceptable and there are no "right" answers per se. Solid arguments could be made on both sides. But by mentioning to the candidate to focus on the financial capacity, we narrow it down and avoid a discussion about operational concerns.

b. Common Mistake: Failure from a reinsurer
   Answer not acceptable :
   - Size : 68% had less than $10 million in capital

   Comment: This part was generally responded to well, with many candidates received full credit.

Question 18

Answer key:

a. No, only private passenger vehicles can be ceded
b. Yes, motorcycle can be ceded to the pool
c. No, the premium transferred for the risk must have been determined according to the Insurer's Standard Rate Manual
d. Yes, the risk meets the compulsory minimum limit. Can be ceded even though the vehicle is stored.
e. Yes, a risk transferred shall be insured under third party liability for at least the Quebec compulsory minimum limit, which is $50,000.

Actual candidate answer for full marks:

(a) No, this a residual risk
(b) Yes. No restrictions in PQ for motorcycle & limits can be endorsed
(c) No, special discount not allowed, premiums must be approved
(d) Yes allowed, no restrictions on seasonality of use as long as insurer is ok with sharing the risk
(e) Yes allowed, meets standards for transfer in PQ

Examiner's report:

Very few candidates received full marks on this question. It appeared to the graders that numerous candidates had guessed the answers. Common mistakes include the following:

- Most candidates did not know that motorcycles are not accepted in the Ontario RSP but are in the Quebec PRR (RSP).
- A number of candidates did not know that winter storage is not problematic when ceding a risk to the RSP.
- Very few candidates knew that the minimum limit for cessions in Quebec is $50,000.

On a different note, most candidates know that "flexing" (special discount) was not allowed when ceding to the Quebec RSP, and some even knew that if the broker had flexed the premium, the company could still cede the risk, as long as the unflexed premium was ceded.

Question 19

Answer key:

a) (only mark the first two)
- Violate the principle of retribution
  - ✧ Alternative answer: drivers responsible for accidents do not suffer consequences for the losses they cause
  - ✧ Alternative answer: at-fault injured drivers get the same compensation as an innocent person
  - ✧ Alternative answer: at-fault drivers do not get penalized
- An at-fault driver with a high-paying job receive greater benefits than an innocent but lower wage-earning person whom he or she also injured.
  - ✧ Alternative answer: higher-income victims receive more benefits
  - ✧ Alternative answer: benefits depend on income level of victims
- Injury insurance tends to overcompensate people with minor injuries and undercompensate those with permanent and more severe injuries and those with higher incomes if aggregate limits are in place.
- Less individualized compensation than liability process
  - ✧ Alternative answer: benefits are "mechanically" determined
  - ✧ Alternative answer: place little emphasis on individual factors

b) (only mark the first four)
- Liability insurance denies compensation to people who have only committed minor errors, whereas injury insurance does not
- Innocent dependants of an at-fault driver are not denied compensation
  - ✧ Alternative answer: families of an at-fault driver under liability insurance are forced into welfare, subsidizing the costs through some other social system rather than the motor vehicle insurance system
- More straightforward than liability system
  - ✧ Alternative answer: less contentious than liability system
  - ✧ Common mistake : everyone is compensated
- Less adversarial than liability compensation
  - ✧ Alternative answer: more certain outcome than liability compensation
- Compensation is paid out within days
  - ✧ Alternative answer: faster payout than liability compensation
- Lower transaction costs
  - ✧ Resources are used to compensate victims rather than paying lawyers
- Also Accepted:
  - ✧ More focus on recovery (medical benefits)
  - ✧ Not trying a build a tort case and seek pity
  - ✧ Changes focus from money to wellness
  - ✧ Less adversarial
  - ✧ Reduce the gap between at fault and not at fault claimants

c)
- Descriptive – describe in words what types of injuries exceed the threshold
  - ✧ Alternative answer: based on kind of loss
  - ✧ Alternative : verbal threshold

- Monetary – permit liability claims when the economic loss portion exceeds a specified dollar amount
    - ✧ Alternative answer: based on level of loss

Actual candidate answer for full marks:

a) – Does away with the principle of retribution
   – Higher compensation for victims with a high income

b) – Less delays to receive compensation
   – Less court related expenses
   – Can be compensated if minimally at fault
   – Less uncertainty as to payment recovery

c) – Monetary: If amount of award is higher than threshold, can bring action against liable
   – Descriptive: If injury meets threshold criteria can bring actions.

Examiner's report:

a. Common Mistake: Limits are low
b. Ok
c. Comments : This part was generally responded to well, with many candidates receiving full credit

Question 20

Answer key:

a) We need to calculate the unearned premium, so for the period of April 1^{st} to September 30^{th}. The compensation would be 70% of that amount, limited to $700.
   i. Unearned premium (April 1^{st} 2012 to September 30^{th} 2012) = 6 / 12 * $2,200 = $1,100 ¼
   ii. Compensation = 70% * Min($1,000; $1,100) = $700 ½

b) There are two parts to this compensation: the unearned premium and the claim. So the total premium is $450 = $450

   i. Unearned premium (April 1^{st} 2012 to January 31^{st} 2013): = 10 / 12 * $450 = $375 ¼
   ii. Compensation for the premium = 70% * $375 = $262.5 ¼
   iii. Compensation for the claim for personal property policies is limited to $300,000.
   iv. Mary's loss = $315,000 - $5,000 (deductible) = $310,000 ¼
   v. Compensation = Min($300,000; $310,000) = $300,000 ¼
   vi. Total = $300,262.50

Actual candidate answer for full marks:

a) Recovery = 70% x min (1000$; unearned premium)
   Unearned premium = 6/12 x 2200 = 1100
   Recovery = 700$

b) Unearned premium = 10/12 x 450 = 375$
   Recovery = 0.7 x 375 + min (315 000 – 5 000; 300 000$) = 300 252.58

Examiner's report:
Common mistakes : maximum of $250,000 instead of $300, 000
Forgot to multiply by 70% or used wrong percentage
For part b), a lot of candidates forgot about unearned premium calculation

Question 21

Answer key:
a. (**Students may receive credit for any 3 of the following ratios)**
Return on GAAP Equity: Minimum recommended is 5.4%, so actual 6.2% is favorable. Calculated as net income / Equity. This higher-than-benchmark value for this ratio means that the shareholders are receiving a greater return per unit of invested capital. This can mean that net income was high for 2011, or alternatively, the company may have a smaller equity base that it is using to generate profits.

Return on Revenue: Minimum recommended is 6.2%. Calculated as underwriting income + investment income excluding gains + income from subsidiaries as a percentage of gross written premiums. The 2011 result for the company was less than the minimum recommended benchmark (1.0% < 6.2%). Since the ROE was favorable, it is possible that the company had significant investment income gains or other income in 2011 that would have been included in ROE, but excluded from ROR. It is also possible that the company had very high gross written premium in 2011, with a smaller equity base causing the conflicting result for these ratios.

Return on Assets after Tax: Minimum recommended is 2.6%. Actual 2011 result is higher than the benchmark at 3.5%. Calcualted as after tax net income / average assets. This favorable result is consistent with the ROE favorable result, and both include items like investment income gains and other income, reinforcing the possibility that 2011 net income is driven from at least one of these sources. Alternatively, the company could be generating moderate income from a smaller-than-average asset base.

Cash Flow From Operations to NPW: Minimum recommended is 0%. Actual 2011 result is less than the benchmark at 0%, so unfavorable result. The ratio is calculated simply as cash flow from operations / net premiums written. The company paid out cash from claims, expenses and other operations than it received from premiums, investment income (excluding gains/losses), and other operations. Given the favorable result from ROE/ROR and unfavorable ROA, this reinforces the possibility that 2011 net income is driven from investment income or other income sources that would flow through Cash Flow from Investment Activities or Cash Flow From Financing Activities.

Overall, the net income generated by the company in 2011 was positive and significant. However, it appears that the source of the income may have been from one-time sources such as investment gains or other income, and not from underwriting income. If true, then this income may not continue into the future.

b.
Insurance Return on Net Premiums Earned = (U/W income + investment income excl capital gains) / net premiums earned

Return on Revenue = (U/W income + investment income excl gains + income from subs) / GPW

Since the company has no subsidiaries, there is no income from subs in the Return on Revenue calculation.

Return on Revenue * (GPW/NPE) = (U/W income + inv income excl gains) / GPW * (GPW / NPE) = Insurance Return on Net Premiums Earned

Insurance Return on Net Premiums Earned = 1.0% * 1.1 = 1.1%

c.
Overall Net Leverage = (NPW + Liabilities) / Equity
Net Underwriting Leverage Ratio = NPW / Equity
Net Loss Reserves to Equity = Net Loss Reserves / Equity

Overall Net Leverage – Net U/W Leverage Ratio = (NPW – NPW + Liabilities) / Equity = Liabilities / Equity

(Net Loss Reserves / Equity) / (Liabilities / Equity) = Net Loss Reserves / Liabilities

So, Net Loss Reserves to Equity / (Overall Net Leverage – Net U/W Leverage Ratio) = Net Loss reserves / Liabilities = (185%) / (430% – 210%) = 84.1%

Actual candidate answer for full marks:

a) Return on revenue. Benchmark minimum is 6.2%
1% return is clearly outside the acceptable range.
This ratio measures ability to generate insurance profits from total insurance revenues.

$$= \frac{\text{UW Income + Investment Income (excluding gains/losses) + Subsidiary Income/loss}}{\text{GWP}}$$

Return on Equity. MSA minimum is 5.4%   6.2% is within the acceptable range.
This ratio reflects the company's ability to generate profits from shareholder's equity, and is useful for investors comparing across companies.

$$= \frac{\text{Net Income}}{\text{Avg Equity.}}$$

Return on Assets after Tax $= \frac{\text{Net Income}}{\text{Avg Assets}}$ MSA minimum = 2.6%
Company result 3.5% is acceptable.
reflects the ability to generate net income using the asset base.

b) Return on Revenue

$$= \frac{\text{UW income + Investment Income excluding capital gains/losses + subsidiary income}}{\text{GWP}}$$

Insurance return on NPE = Return on revenue x GWP/NPE = 1% x 1.1 = 1.1.%

c) Net UW Leverage Ratio = NPW/Equity = 210%
Overall Net Leverage $= \frac{\text{NPW + Liabilities}}{\text{Equity}}$ = 430%

Liabilities/Equity = 430% - 210% = 220%

Net Loss Reserves to Equity = 185%

Claims/Total liabs
= (Net Loss Reserves/Equity)/(Total Liabilities/Equity)
= 185%/220%
= 84.1%

Examiner's report:

a.

A surprisingly large number of candidates failed to select three profitability ratios, selecting instead to use some solvency ratios like MCT. A smaller group of candidates also finished this part concluding that the company was in good financial condition (despite the fact that the question asks about profitability). Clearly, the candidates are not used to questions asking about profitability.

Many candidates also failed to provide genuine insight into the operations of the theoretical company from the profitability ratios, opting instead to explain the purpose of the ratio and/or providing the formula for the ratio. Whenever a candidate provided genuine insight, we gave that insight 0.5 points toward the insight of the relevant ratio.

b.

Most candidates did well on this part of the question, scoring the full 0.75 points.

c.

The majority of candidates scored 0 or 0.25 points on this question, either because it was too long to attempt or it proved too difficult for their attempt to solve. A small group of candidates discovered a second possible solution that involved taking ratio of ROE to ROA and using that solve for the ratio of Liabilities to Equity, which was then applied to the net loss reserves to Equity ratio to get the ratio of net claims liabilities to total liabilities. This alternate solution was given full marks.

Question 22

Answer key:

(a) Paid in 2012 = 1,800 * 0.35 / 0.6 = 1,050

Paid in 2013 = 1,800 * 0.25 / 0.6 = 750
PV = 1,050/1.03^0.5 + 750/1.03^1.5 = 1,752.07
PV with PFAD int rate = 1,050/1.025^0.5 + 750/1.025^1.5 = 1,759.85
APV = 1,752.07 * 10% + 1,759.85 = 1,935.05

(b) Undiscounted LR AY 2011 = (1,200 + 1,800) / 5,000 = 60%

Investment income = APV / 2 * yield = 38.7
Discounted LR AY 2011 = (1,200 + 1,935.05 – 38.7) / (5,000 + 14) = 61.75%

(c) [Rept Res – 95% * min(claims liab, rept res)] * tax rate * (1 – PV)

= [3,750 – 95% (1,935.05 + 1,379 + 138 + 3)] * 36% * [1 – (1,759.85 + 1,379 + 4)/(1,800 + 1,400)]
= 3.06

(d) Model Solution #1:

Since the claims liabilities deducted for income tax are less than those that appear on financial statements, it creates a prepayment of tax.
Model Solution #2:
Recognized prepayment of tax, as liability reduction for tax purpose is smaller than reported reserves.
Model Solution #3:
Because the reported liabilities have to be at least as large as the actuarial present value and the deduction is 95% of the minimum, the formula creates an asset to reflect the time difference

Actual candidate answer for full marks:

a) <u>AY2011</u>
PV $= 1800/60\,(35/1.03^{0.5} + 25/1.03^{1.5})$
$= 1752.07$

PV @ 2.5% = 1759.85

APV = 1752.07 (10%) + 1759.85
= 1,935.05

b) Undiscounted LR AY 2011: (1200 + 1800) / 5,000 = 60%

Investment inc. unpaid = $\text{APV}/2 \times \overset{8\%}{\text{yield}} = 38.70$

$$\text{Discounted LR AY 2011} = \frac{1200 + \overset{\text{APV}}{1935.05} - \overset{\text{I.I.}}{38.7}}{5{,}000 + \underset{1.1\ \text{on UPR}}{14}} = 61.75\%$$

c) [Rptd Res – 95% $\overset{\text{Claim liab}}{\text{min (Reptd Res)}}$] • tax rate (1 – PV factor)
$= (3750 - 95\%\,(1{,}935.05 + 1379 + 138 + 3)\,(36\%)\left(1 - \frac{1759.85 + 1379 + 4}{1800 + 1400}\right)$
= 3.06

d) only subtract 95% of liab, so income ↑, & so tax ↑ current year, but this is a prepayment of tax, so asset for future inc. taxes

Examiner's report:

a. For this part, most of the candidates are able to answer and get full points. There are a few candidates that made mistakes on:
   1. calculating the PV with PFAD – increasing the discount rate instead of decreasing
   2. using a wrong discount rate – using the 4%, which is the investment yield

3. using the unpaid as the ultimate loss – using the 1,800 as the ultimate loss to calculate the payment for the next 3 years.

b. Most of the candidates are able to calculate the undiscounted loss ratio. A common mistake that candidates have on the calculation of the investment income is to use the AY 2010 unpaid as the beginning unpaid for AY 2011. For the discounted loss ratio, most of the candidates have the correct formula.

c. Not a lot of candidates get this part right. One common mistake that candidates make is to only take into account AY 2011, not both of them. The other common mistake that candidates make is not to include the interest rate PFAD when calculating the present value factor.

d. Most of the candidates answered that it presents the prepayment of tax. But a lot of candidates lost point since they did not correctly point out that only 95% of the minimum of reported reserve or claim liability is deducted.

Question 23

Answer key:

Investment income to calculate A = (1,488 + 869 + 1,164 + 736) / 2 * 4% = 85.14

A = ((1,488 + 869) – (580 + 1,164 + 736) + 85.14) / (1,488 + 869) = -1.61%

Investment income to calculate B = (1,164 + 736 + 677 + 489) / 2 * 3.75% = 57.49

B = ((1,488 + 869) – (580 + 750 + 677 + 489) + 85.14 + 57.49) / (1,488 + 869) = 0.15%

Actual candidate answer for full marks:

A = xs (def.) ratio for
AY 2009 and prior
at end of 2010

$$A = \frac{\left[1488 + 869 - 580 - 1164 - 736 + 0.04 \times \left(\frac{1164 + 736 + 1488 + 869}{2}\right)\right]}{1488 + 869}$$

A = -37.86 / 2357 = -1.61%

B = xs (def) ratio for AY 2009 & prior at end of 2011

$$= \frac{\left[1488 + 869 - 580 - 750 - 677 - 489 + 85.14 + 0.0375 \times \left(\frac{1164 + 736 + 677 + 489}{2}\right)\right]}{1488 + 869}$$

B = 3.63 / 2357 = 0.15%

Examiner's report:

This question was generally responded to well, with many candidates receiving full credit.
The most common mistake was that candidates were calculating B as an excess (deficiency) ratio of 2010 reserves instead of the initial reserves, which is what the P&C-1 shows.

Question 24

Answer key:

(a)

Model Solution #1:

1. Equity will increase given 10% profit. It will increase MCT
2. Claims liability will increase. It will decrease MCT given the capital required on claims liability
3. Total investment will increase. It will decrease MCT given the capital required for assets
4. UPR will increase. It will decrease MCT given the additional capital required

Model Solution #2:

1. UPR will increase. MCT decrease.
2. Claims reserves will increase. MCT decrease.
3. Investments will cause increase in capital required. MCT decrease
4. Premium receivable could increase cause MCT decrease

Model Solution #3:

1. Unpaid claims will increase, increasing capital required, decreasing MCT
2. Unearned premium will increase, increasing capital required, decreasing MCT
3. Investment in common shares will increase, increasing capital required, decreasing MCT
4. Investments in bonds will increase, increasing capital required, decreasing MCT

(b)

Model Solution #1:
Invest cash into government grade bonds or keep it as cash.
Model Solution #2:
It should find a way to settle claims faster by hiring more personnel.
Model Solution #3:
Consider increase its reinsurance capacity from registered reinsurer, which will decrease net unearned premium and unpaid claims.
Model Solution #4:
Inject capital

Actual candidate answer for full marks:

a.
1. Equity will increase given 10% profit.
it will increase MCT.
2. claim liability will increase given Capital Required on Liability
it will decrease MCT
3. total investment will increase
it will decrease MCT given the Capital required for Assets
4. UPR will increase.
it will decrease MCT given the additional Capital Required.

b. Invest the cash into government grade bonds or keep it as cash.

Examiner's report:

a. Most of the candidates get the balance sheet accounts identified. Some candidates made mistake as they put income statement account, instead of the balance sheet account. There are quite a number of candidates mentioned the change in capital required or capital available, but did not comment on the impact to the MCT.
b. Most of the candidates get this part correct. The only common mistake that candidates made is when they suggest buying more reinsurance, they did not mention the reinsurer should be a registered reinsurer.

Question 25

Answer key:

Model Solution #1:

(a) It will decrease since fixed income investments worth less when market rate increase.
(b) They will decrease. As market interest rate increase, the book yield will increase, making the PV of liabilities decrease
(c) Since the liabilities decrease and variation of assets are not reported in net income, net income will increase
(d) Other comprehensive income will decrease because available-for-sale assets have their variation reported in other comprehensive income

Model Solution #2:

(a) Total asset value in BS will be lower due to increase in market interest rate and all fixed income investments are classified as AFS as these assets are booking market value in the balance sheet.
(b) Total liability will be lower since discount rate is determined by portfolio yield and portfolio yields a higher discount rate and thus the actuarial liability will be lower as it is discounting at a higher discount rate
(c) Net income will be higher since the actuarial liabilities is lower and no changes in the premium written
(d) As interest rate increase, the market value of investments decreases. Therefore the marked to market decreases and thus OCI is lower

Actual candidate answer for full marks:

(a) Decrease → available for sale bonds are discounted at market yields → invested assets decrease
(b) Decrease → losses are discounted at market yields → actuarial liabilities decrease
(c) Increase → actuarial liabilities decrease
(d) Decrease → unrealized loss from invested assets decrease

Examiner's report:

Most of the candidates got the increase/decrease correctly. The area that the candidates lost their points is on the explanation. Some common mistakes that they made:

1. For the total asset, some candidates are conceptually wrong saying that the total assets won't be affected due to the change in market value flow through OCI.
2. For the liabilities, candidates lost their points on not mentioning the discount rate.

Question 26

Answer key:
In part a, the graders gave full marks to any candidate that did not include the interest rate margin in the loss ratios. The Cantin & Trahin paper inexplicably does not have this provision in its Exhibit III, despite explaining in the text that it should be included.

a.
Reinsurance recovery margin as a percentage of UPR = ratio of ceded claim to UPR * reinsurance MfAD
Discounted loss ratio including all margins at accident date = discounted loss ratio excluding all margins * (1 + claims development MfAD) + (disc LR incl interest rate margin – disc LR excl all margins) + reinsurance recovery margin as a percentage of UPR * disc LR excl all margins
Discounted loss ratio including all margins at evaluation date = disc LR incl all margins at accident date * (1 – percentage of unearned premium in invested assets * (1 – disc factor from average accident date to evaluation date))

Liability:
Discounted loss ratio excluding margins = 0.70 * 0.83 = 0.581
Discounted loss ratio including interest rate margin = 0.70 * 0.86 = 0.602
Reinsurance recovery margin for liability = 30% * 3% = 0.009
Disc loss ratio including all margins at accident date = 0.581 * (1.1) + (0.602 – 0.581) + 0.009 * 0.83 = 0.6676
Disc loss ratio including all margins at evaluation date = 0.6676 * (1 – 0.7 * (1 – 0.97)) = 0.654

b.
Equity in the unearned premium = (Unearned premium – discounted claims with margins – discounted LAE with margins – discounted maintenance expenses – discounted contingent commisssions with margins)

Property:
Discounted claims with margins = 0.748 * 20,000 = 14,960
Discounted claims with margins plus LAE = 14,960 * (1.12) =16,755.2

Liability:
Discounted claims with margins = 0.654 * 15,000 = 9,810
Discounted claims with margins plus LAE = 9,810 * (1.12) = 10,987.2

All lines combined discounted to evaluation date maintenance expenses = (20,000 + 15,000) * .04 * 0.97 = 1,358

Equity in the unearned premium = 20,000 + 15,000 – 16,755.2 – 10,987.2 – 1,358 – 500 = 5,399.6

Since the equity in the unearned premium is less than the deferred policy acquisition expenses (5,399.6 < 6,000) the booked DPAE would be 5,399.6.

c.
Yes, a premium liability can exist if a company has no deferred policy acquisition expenses. If the losses and related expenses are high enough that the equity in the unearned premium is negative, then a

premium deficiency exists and is set up as a liability (this is different than in part b above where the asset for DPAE was written down instead).

Actual candidate answer for full marks:

a) ***(1)*** Reins Recovery Margin = Expected ceded losses/NUEP x MFAD-reins
= 0.3 x 0.03 = 0.009

(2) LR with margins disc to AAD
=Disc. % paid [Net Undisc LR (1 + PFAD-clms dev) + **(1)**]
= 83% [0.7 (1.1) + 0.009]
= 64.66%

(3) Disc. LR with margins
= ***(2)*** [1 - %UEP in inv assets (1 – Disc. from AAD to Eval Date)]
= 64.66% [1 – 0.7 (1 – 0.97)]
= 63.3%
X = 64.6%
Y = 63.3%

b) EQUP = UEP – Expected future losses – IAE – Maintenance Expenses – Cont Comm
UEP = 20 000 + 15 000 = 35 000
Expected future Losses = Disc. LR x 15 000 + 20 000 x 0.748 = 24 455
IAE = 0.12 x 24 455 = 2934.6
Maint. Expenses = 0.04 x 35 000 x 0.97 = 1358
Cont Comm = 500

→EQUP = 5752
DPAE = 5000 > 5752 → Reduce DPAE to 5752

c) When EQUP<0 → prem deficiency if EQUP < 0 & DPAE < |EQUP| →reduce DPAE to 0
set a liability for remaining deficiency

Examiner's report:

a.
Many candidates made mistakes in correctly determining the reinsurance PfAD amount (either mis-applying the ratio given in the question or forgetting to discount it), as well in the calculation of Y from X omitting the percentage of unearned premium in invested assets in the calculation.

b.
Straightforward question. Candidates generally did relatively well on this part.

c.
Due to inconsistencies in the Cantin & Trahin paper, grades were given generously for this part. Most candidates received the full 0.5 marks.

Question 27

Answer key:

Total equity

Total equity
= Shares Issued and paid + contributed surplus + Retained Earnings + Reserves + AOCI
= 50,000 + 20,000 + 5,000 + 1,000 + 5,000
= 81,000

Capital Available

Capital Available
= Total Equity less AOCI + AOCI on available for sales equity + AOCI on available for sale debt securities + AOCI on foreign currency + subordinated indebtedness and preferred shares – assets with a capital requirement of 100% = (81,000 – 5,000) + 1,000 + 2,000 + 2,000 + 1,000 – 500
= 81,500

Capital for Unearned Premiums/Unpaid Claims

Capital Required for UPR = max [50% * 52,000, 25,000] * 8% + max [50% * 30,000, 17,000]* 8% = 26,000 * 0.08 + 17,000 * 0.08 = 3,440

Capital Required for unpaid claims = 25,000 * 10% + 4,000 * 5% = 2,700

Total capital required for UPR and unpaid claims = 3,440 + 2,700 = 6,140

Capital for Reinsurance Ceded to Unregistered Insurers

For ABC Re, 10% on UPR and o/s loss = (500 + 1,000) * 10% = 150
For XYZ Re, 10% on UPR and o/s loss = (2,000 + 2,500) * 10% = 450

The margin requirement for each unregistered reinsurer maybe reduce to a min of 0 by letter of credit and by deposits held as security that are in excess of the amount of ceded reserves, both divided by 1.5

Deposits available to apply to margin = non-owned deposits held as security – UPR ceded – o/s loss recoverable – receivable + payable, where positive

For ABC Re = max (0, 2,000 – 500 – 1,000 – 250 + 0) = 250
For XYZ Re = max (0, 500 – 2,000 – 2,500 – 0 + 3,500) = 0

Margin required = max[0, 10% margin on UPR & o/s Loss – (deposits available to apply to margin + LOC)/ 1.5]

For ABC Re = max [0, 150 – (250 + 250)/ 1.5] = 0
For XYZ Re = max [0, 450 – (0 + 0)/1.5] = 450

Alternative solution:
Deposits available to apply to margin = non-owned deposits held as security + LOC – UPR ceded – o/s loss recoverable – receivable + payable, where positive
For ABC Re = max (0, 2,000 + 250 – 500 – 1,000 – 250 + 0) = 500

For XYZ Re = max (0, 500 + 0 – 2,000 – 2,500 – 0 + 3,500) = 0
Margin required = max[0, 10% margin on UPR & o/s Loss – deposits available to apply to margin/ 1.5]
For ABC Re = max [0,150 - 500/1.5] = 0
For XYZ Re = max [0, 450 – 0 /1.5] = 450

Hence, capital required for unregistered reinsurance = 0 + 450 = 450

Capital Required
Capital required = balanced sheet assets + margin for unearned premium & unpaid loss + margine for reinsurance ceded to unregistered reinsurers + margin for Structured Settlements, Letters of Credit, Derivatives and Other Exposures
= 20,000 + 6,140 + 450 + 10
= 26,600

MCT Ratio (0.25 total)
MCT = Capital Available / Capital Required
= 81,500 / 26,600
= 306.4%

Actions
> 150% -> OSFI is satisfied, no action required
> 200% -> company is satisfied, no action require
Action may differ dependent on MCT ratio calculated.

Actual candidate answer for full marks:
Capital available
Total Equity – AOCI = 76,000

auto liab & PA
UPR margin = .08 x max[25,000, 0.5 x 52,000]
= 2,080
unpaid margin = 25,000 x .1 = 2,500

auto – other
UPR margin = .08 x max[17,000, 0.5 x 30,000]
= 1,360
Unpaid margin = 4,000 x 0.5 = 200

→cap req. on UPR/unpaid/def. = 2080 + 2500 +1360 + 200
= 6140

margin for unreg.
ABC = 10% (500 + 1000) – 1/1.5 x max[0, 250 + 2000 + 0 – (500 + 1000 +250)]
= 150 – 500/1.5
= <0 →0

XYZ = 450 – 1/1.5 x 0 = 450

total Cap available = 76,000 + 1,000 + 5,000 – 500 = 81,500
total Cap required = 20,000 + 6150 + 450 + 10 = 26,600

MCT = 81500/26600 = 306.4%
The MCT is above internal target and company just needs to monitor that it stays this way now and in the future

Examiner's report:
This question was generally responded to well, with many candidates receiving full credit.
The most common mistake was that candidates were lumping company ABC and XYZ together in calculating capital for reinsurance ceded to unregistered insurers. Some other responses that lost points related to capital available and capital for UPR for not taking the max between the UPR and WP.

Question 28

Answer key:
a) An institution's stress testing program should serve the following purposes:
- Risk identification and control – stress testing should be included in an institution's risk management activities at various levels, for example, ranging from risk mitigation policies at a detailed or portfolio level to adjusting the institution's business strategy.
- Providing a complementary risk perspective to other risk management tools – stress tests should complement risk quantitative methodologies that are based on complex, quantitative models using backward looking data and estimated statistical relationships. As stress testing allows for the simulation of shocks which have not previously occurred, it should be used to assess the robustness of models to possible changes in the economic and financial environment
- Supporting capital management – should form an integral part of institutions' internal capital management where rigorous, forward-looking stress testing can identify severe events
- Improving liquidity management – stress testing should be a central tool in identifying, measuring and controlling funding liquidity risks.

Additional possibilities:
A) Evaluate the effects on an institution's financial condition of a set of specified changes in risk factors
B) Important after long periods of benign economic and financial conditions
C) A key risk management tool/technique (during periods of expansion)
D) Determine the impact of situations where the assumptions underlying established models break down
E) Identify threats and potential management actions to address them
F) Provide guidance on what risks are most likely to impact the financial condition

b) Senior management is responsible for:
- Implementation of stress testing program
- Management of stress testing program
- Oversight of stress testing program
- Ensuring that the institution has adequate plans to deal with remote but plausible stress scenarios

The board must ensure that:

- Must be aware of key findings of the stress tests
- Its senior management has in place a "fit for purpose" program that is enterprise wide
- Management has adopted policies requiring appropriate use of stress testing as a management tool

Additional possibilities:

The management –

1) identify and clearly articulate the institution's risk appetite and understand the impact of stress events on the risk profile of the institution
2) participate in the review and identification of potential stress scenarios
3) contribute to the development and implementation of risk mitigation strategies

The board –

1) has ultimate responsibility for the overall stress testing program

Actual candidate answer for full marks:

a) – risk identification and control: stress testing should address institution wide risks and interactions between risks
   – provide a complementary risk perspective to other risk management tool: can be used to validate other statistical models
   – improve liquidity management: assess liquidity risk profile of company and liquidity buffers

b) Senior Mgmt → design/develop/implement stress testing programs
   → develop mitigation strategies and plans
   Board → ultimate responsibility of program
   → review/approve results

Examiner's report:

a) Candidates were able to provide a list of purposes for the most part, but fell short when the time to give explanations came. This is not hard to understand as the descriptions in Guideline E-18 are sometimes not as intuitive as they could be (and it appears that candidates tried to replicate them as opposed to explaining them in their own words).
b) A variety of answers was provided to this question, and the graders observed that generally, candidates confused Management's responsibilities with the Board's. Additionally, very few candidates provided the answers in the answer key for the Board's responsibilities, but a large number of candidates came up with other acceptable answers.

Question 29

Answer key:

a) The insurer's financial condition is satisfactory if throughout the forecast period it is able to meet all future obligations under the base scenario and all plausible adverse scenarios (assets > liabilities), and under the base scenario it meets the minimum regulatory capital requirement (MCT >100%).

Company A satisfies both conditions - satisfactory
Company B fails in adverse scenario for 2013 (negative equity) – not satisfactory
Company C fails in base scenario 2012 (MCT < 100%) – not satisfactory

b)

- In order to absorb unexpected losses beyond those covered by the supervisory target
- Provide adequate time for management to resolve financial problems that arise, while minimizing the need for OSFI intervention

c)
Insurers are expected to maintain actual capital in excess of their Internal Target, although it may fall below on rare and unforeseen occasions. If the capital level of an insurer falls, or is anticipated to fall within two years, below its internal target, as is projected to happen to Company A in 2013, **it is required to inform OSFI immediately and provide plans on how it expects to manage the risks and/or restore its capital level to its internal target within a reasonable and relatively short period of time.**

-since base scenario MCT falls below target in the projection period
-provide plans to OSFI on how it expects to return to target

Actual candidate answer for full marks:

a) Cie A: satisfactory because MCT > 100% under base scenario and equity + under all scenarios
Cie B: not satisfactory because equity – under adverse scenario of 2013
Cie C: not satisfactory because MCT < 100% under base scenario of 2013

b) 1. because it is used to address other risks exposed by the company not captured by supervisory target test (absorb unexpected losses)
2. because it will trigger management actions before regulators actions

c) Disclosure to OSFI if company is expecting to fall below internal ratio of 170% such as in cie A, 3 out of the 4 MCT ratios , 170%
Disclosure to OSFI as to how cie expects to return to internal ratio (lay out plans) and timeframe needed to do so

Examiner's report:

a) In general the candidates did very well. The most common errors were not clearly justifying why a company is or is not in satisfactory financial condition
b) Candidates did very well on this section, but a common error was saying that consideration for an internal target is market or economic fluctuations.
c) Most candidates did well and disclosed that OSFI should be notified but a common error was to not mention that a company also needs to provide a timely plan on how it will get back to above its internal target.

Question 30

Answer key:
Part (a)

There are three specific PFAD's in the estimation of claims liabilities on a fair value basis.

(1) Discount rate
The three major risks to be addressed here are credit risk, interest rate risk and timing risk.

(a) Credit Risk
Not all investments are of the same quality. Bond and preferred share issuers are rated by independent firms. Investors, rightly or wrongly, use this type of information and together with their seasoned judgment, trade these securities in the secondary market. Over a period of time, the respective yields of each security can be compared against the most secure security. In Canada, the most secure security is the bond issued or guaranteed by the Government of Canada. The extra yield over the comparable Canada's (i.e., the same maturity) is the implied credit risk determined by the market place. (Please note: Credit risk of an issuer will vary over time if its financial condition changes)

(b) Interest Rate Risk (also knows as mismatching of asset/liability risk)
For this section, only bonds and T-bills are used as investments. It is a well-known concept in the financial markets that a bond portfolio's market value will change inversely proportional to the product of duration and the change in interest rate when the yield curve is normal. For example, if a bond portfolio has a duration of three years, its value would go up about 3% for every 100 basis point decrease in interest rate. If the claims liability should have an identical duration, its value will also go up about 3% when the discount rate decreases 100 basis points. In that case, the change in shareholder equity is almost zero. This example shows that it is not necessary to forecast the detailed cahsflow on the asset side of the balance sheet to assess the interest rate risk. In general, the interest rate risk can be approximated as:

[liability / invested assets] x the absolute value of [(asset duration – liability duration) / liability duration] x anticipated change in interest rate

(c) Timing Risk
The amount of discount can be viewed as a product of annual discount rate x liability duration. As faster payment means a shorter liability duration and a smaller discount, the same effect can be achieved by decreasing the discount rate.

Part (b)

Using the formula

[liability / invested assets] x the absolute value of [(asset duration – liability duration) / liability duration] x anticipated change in interest rate

500/750 * (.5/2.75) * 100 bp = 12.1 bp

Actual candidate answer for full marks:

a)

Credit risk: It is the risk that is accociated between a government bond and a corporate bond. The extra yield of a corporate bond over the government bond correspond to the credit margin

Interest rate risk: It is the mismatch between asset and liabilities. Asset supports the expected liabilities and a mismatch risk could be quantified.

Timing risk: It is the risk that the claims are settled faster than assumed (early payment than anticipated)

b) Interest rate risk = $\frac{\text{Liabilities}}{\text{Invested Asset}} \cdot \frac{|\text{Liabilities} - \text{Asset duration}|}{\text{Liab. duration}} \cdot$ Anticipated chg in interest rate

$= 500/700 \cdot \frac{|2{,}75 - 3{,}25|}{2{,}75} \cdot 1\%$

$= 0{,}12\%$

Examiner's report:

a) Overall candidates did well but two common errors were i) with respect to credit risk, some candidates discussed reinsurer credit risk and this is not part of the provision for adverse deviation for the discount rate and 2) a very common error of candidates not describing what timing risk was.

b) Overall candidates did very well.

Question 31

Answer key:

Part (a)

i. Purpose of TAR - Going concern level of assets that regulator expects an insurer to maintain as a minimum

Purpose of MAR - Determines the point at which the regulator takes control or other appropriate action

ii. Use of standard versus internal models – TAR – must indicate **either** can be used

Use of standard versus internal models – MAR – standard only

iii. Sufficiency level for TAR - 99.5% VaR or 99% TVaR over 1 yr horizon + terminal provision (note: this is preliminary and subject to further revision due to impact assessment and calibration)

Sufficiency level for MAR - to be determined

Part (b)

Terminal provision – The amount of assets needed at the end of the time horizon for the insurer to fulfill its policyholder obligations over the remaining lifetime of those obligations or to pass the risks on to a succeeding insurer. The determination of the terminal provision will recognize the severe adversity tested within the preceding time horizon for supervisory action.

Actual candidate answer for full marks:

(a) (i) TAR – determines the minimum level of assets on a going concern basis, that the regulator expects the insurer to maintain.

MAR – determines the point at which the regulator takes control or other appropriate action

(ii) TAR – standard or internal
MAR – standard only

(iii) TAR – 99.5% VAR or 99% TVaR over a 1 yr time horizon. After 1 yr, there must be sufficient assets to run off or sell the business
MAR – TBD

(b) The level of assets at which they are sufficient to compensate or transfer policyholder obligations after the time horizon.

Examiner's report:

a) A common error was using the description and definition of the internal target as a substitute for the regulatory target asset requirement however consideration was given to candidates who for purpose of TAR and MAR gave an overview of the committees proposal. With respect to the use of standard versus internal models, consideration was given to candidates who defined what and how these models are used.
b) Many candidates had difficulty defining terminal provision

Question 32

Answer key:

a.

The ambivalence point is a point estimate monetary figure representing the highest value the seller is willing to pay the buyer, beyond which, the economics become unattractive (relative to allowing natural runoff of the obligations).
Note: need to mention both points to get full credit.

b.

Actuarial discount value = 937 + 23 = 960

Tax basis reserves = 0.95 * min [1000, 960] = 912

Let X be the ambivalence point, then

X = (X – 912) * 0.4 + 937
X = 954
> 937, hence tax consideration increase the seller's ambivalence point

c.

For the seller, the best adjustment is to isolate all the data subject to the transaction, premium, loss, claim count, etc, remove it from the historic database, and computer IBNR loss and expense reserves as though the commuted agreement never existed.

The reverse is true for the buyer. The same isolated data must now be added into the historic net database, since the buyer will experience loss development and IBNR and must forecast it within its reserving structure.

Actual candidate answer for full marks:

a) max point at which seller willing to pay to commute liabilities beyond which economics unattractive to seller

b) AP = (AP – tax basis reserve) (tax rate) + PV reserve

tax basis is = 95% min (Reptd, Net Claim Liab)]
= 95% (937 + 23)
= 912

AP = (AP – 912) (40%) + 937
0.5 AP = 572.2
AP = 953.67

(AP – 912) x 90%
tax effect: -seller willing to pay <u>tax on commutation</u> plus PV res.
-taxes seller would have paid if not commuted

c) seller: remove all historical claims commuted from a database so that triangles not distorted
buyer: add all these claims to " " " " " not distorted

Examiner's report:
Students are generally weak in this question. Most candidates missed to mention that the commutation would become economically unattractive beyond the ambivalence point. Quite a number of candidates failed to demonstrate the concept of taking minimum of undiscounted unpaid liability and actuarial discount value in the calculation of tax basis reserves.

Question 33

Answer key:
The reinsurer assumes significant insurance risk under the reinsured portion of the underlying insurance agreement
It is reasonably possible that the reinsurer may realize a significant loss from the transaction.

Actual candidate answer for full marks:

1) Reinsurer assumes significant insurance risk under the reinsured portion of the contract
2) It is reasonably possible that the reinsurer will realize a significant loss
If 2) above is not met, insurance risk is transferred if reinsurer assumes substantially all of the risk under the reinsured portion of the contract

Examiner's report:
Overall candidates did very well. Full marks were not given for just referring to the "10-10" rule.

Question 34

Answer key:

a.

- Subsequent event. Happened after the account date, so Actuary could not have been aware of it at the account date.
- Since the event is before the report date actuary should take into account. Event makes entity different after the account date, so this is Type B event. Report this event (disclose in the notes to the financial statement), but do not take into account in the calculations.

b.

- Errors that are material need to be fixed therefore needs to be taken into account. (deduction will be made to those candidates that only identify the event as subsequent or not but do not explain it – this is because both answers are accepted if supported).
- Event occurred before the calculation date. Incorporate into analysis – not treated as subsequent event. Treat as if knowledge obtain before calculation date.

c.

- Subsequent event. Both the failure and actuaries knowledge occurred after the account date. (deduction will be made to those candidates that only identify the event as subsequent or not).
- Based on the Standards of Practice this is a Type A event, which is an event that provides further evidence of conditions that existed at the financial statement date. The failure of the reinsurer is classified as a Type A event, and is taken into account in the policy liabilities valuation.

Actual candidate answer for full marks:

a. it occurs before the report date, but after the calculation date, so it is a subsequent event. It is a type B event since it materially affects the company only after the calculation date. the event is not included in liabilities, but is fully disclosed.

b. the appointed actuary is made aware between the calculation date and report date so it is a subsequent event. Since it is due to an error, it must be corrected and directors should be made aware.

c. both awareness of the actuary and occurence of event are between calculation date and report date, so it is a subsequent event. It retroactively makes entity different at calculation date. make corrections and advise directors

Examiner's report:

Section a) and c) were well answered by most candidates. The most common error was to mention "subsequent event" without a proper justification. Some candidates have also said that since event occurred after the calculation date, it was not a subsequent event.

For section b), we have accepted both "yes" and "no" as a valid answer if the justification was correct. One of the most common errors was to not mention that the error was "material".

Question 35

Answer key:

a) Concentrations of insurance risk, including a description of how management determines concentration and a description of the shared characteristic that identifies each concentration.
b) The insurer may include a description of its concentration by business segment, geographic region, or any other characteristic relevant to its operations (2 out of 3)
c) 2 out of 3: diversification, underwriting limits, reinsurance

Actual candidate answer for full marks:

a) 1) How the management determined concentration
   2) What are the shared characteristics that defines the concentration (territorial, products, etc.)

b) Territory, products type

c) 1) Diversification
   2) Underwriting limit

Examiner's report:

This question was not well understood by candidates. For section b) and c), we have accepted answers that were included in the answer to sections a), b) or c). For sections b) and c) we have accepted some answers that weren't mentioned in the text but made sense in the context of the question.

In section a), we have accepted many answers that could be similar to "description of the shared characteristic that identifies each concentration".

Question 36

Answer key:

a. Three of the following

- Review the annual statement of the company before the annual statement is approved by the directors
- Review such returns of the company as the Superintendent may specify
- Require the management of the company to implement and maintain appropriate internal control procedure
- Review such investments and transactions that would adversely affect the well-being of the company as the auditor or any officer of the company may bring to the attention of the committee
- Meet with the auditor to discuss the annual statement and the returns and transactions
- Meet with the actuary of the company to discuss the parts of the annual statement and the annual return filed under section 665 prepared by the actuary.
- Meet with the chief internal auditor of the company, or the officer or employee of the company acting is a similar capacity, and the management of the company, to discuss the effectiveness of the internal control procedures established for the company.

b. (i)
The actuary of a company shall meet with the directors of the company at least once during each financial year in order to report, in accordance with generally accepted actuarial practice and any direction that may be made by the Superintendent, on financial position of the company, and the expected future financial condition of the company
Other possible answers:
An actuary of a company who resigns or whose appointment is revoked shall submit to the directors of the company and the Superintendent a written statement of the circumstances and reasons why the actuary resigned or why, in the actuary's opinion, the actuary's appointment was revoked.

(ii)
(1) The actuary of a company shall report in writing to the chief executive officer and chief financial officer of the company any matters that have come to the actuary's attention in the course of carrying out the actuary's duties and that in the actuaries opinion have material adverse effects on the financial condition of the company and require rectification
Other possible answers:
An actuary of a company who makes a report under subsection (1) shall forthwith provide a copy of it to the directors of the company
Where, in the opinion of the actuary of the company, suitable action is not being taken to rectify the matters referred to in subsection (1), the actuary shall forthwith send a copy of the report to the Superintendent and advise the directors that the actuary has done so.

Actual candidate answer for full marks:

a) –Review annual statement before approval from directors.
–Review returns specified by the superintendent
–Review investment and transactions that adversely affect the company.

b) i) Must report at least annually to directors on the financial condition of the company and when specified on the expected future financial condition of the company.

ii)
-Must report to officers on matters that adversely affect the company and that requires rectifications.
-Should include recommendations for rectification and appropriate deadlines.
-If actuary believes no suitable actions have been taken, should submit the report to superintendent and inform directors that has done so.

Examiner's report:

On part a), most candidates were able to provide 2 of the 3 required items. The most common mistake was to only enter "Meet with actuary" or "Meet with Management" without describing what the meeting was about. Also, answering "Review annual statement" was not accepted as a valid answer without mentioning the reason or the timing of this review.

On part b), most candidates that answered this section got it right. Most common mistake was to not be precise enough in the answer. We were looking for "financial position of the company", "expected future financial condition" when discussing the meeting with directors. We were looking for "matters that have material adverse effects on the financial condition of the company" and "require rectification" when discussing the meeting with the CEO.

Question 37

Answer key:
3 of the following:

- Ascertain that the work of the AA is within the range of accepted actuarial practice, as established by the CIA, and is consistent with any objectives or requirements established by OSFI in Regulations, Guidelines or the Memorandum to the AA.
- Review the adequacy of procedures, systems and the work of others relied on by the AA, to the extent that these are not reviewed by the external auditor.
- Discuss with the AA the appropriateness of each of the assumptions made and the methods employed in the valuation of actuarial policy liabilities and ascertain that the assumptions are at the appropriate point in the range of accepted actuarial practice.
- Determine whether the AA report accurately describes the assumptions and methodology employed by the AA.
- Review and discuss with the AA the methodology, assumptions and scenarios used for the future financial conditions reporting as required by the Superintendent, usually based on DCAT.

Actual candidate answer for full marks:

1. Ascertain that the Appointed Actuary's work is consistent with the accepted actuarial practice and is in compliance with guidelines, regulations set by the Superintendent
2. Assess the adequacy of procedures systems need data that are relied by the Appointed actuary to the extent that are not reviewed by the external auditor. It includes checks on data: integrity and checks on the methodology used to validate the calculations.
3. Ascertain that the Appointed Actuary's report accurately and adequately describe the methods and assumptions used by the Appointed Actuary is measuring policy liabilities.

Examiner's report:
A majority of the candidates got at least partial credit on the items they have provided. The most common mistake was to not answer the question with enough details per item to collect full credit. Also, some candidates provided only two of the three required items.