Exam 6-Canada

Regulation and Financial Reporting
(Nation Specific)

October 28, 2013

4 HOURS

INSTRUCTIONS TO CANDIDATES

1. This 79 point examination consists of 36 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 <u>dark</u> pencil or ink. Do not use multiple colors or correction fluid.

    - 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. <u>Write only on the front lined side of the paper</u> – **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. <u>When a specified number of items are requested, do not offer more items than requested.</u> For example, if you are requested to provide three items, only the first three responses will be graded.

    - <u>In order to receive full credit</u> or to maximize partial credit on mathematical and computational questions, you must clearly outline your approach in either verbal or mathematical form, <u>showing calculations</u> where necessary. Also, you must clearly <u>specify any additional assumptions</u> 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 18, 2013.

END OF INSTRUCTIONS

1. (2 points)

   a. (1 point)

      Describe the ruling in the case of Paul v. Virginia and discuss its implication for the P&C insurance industry in the U.S.

   b. (1 point)

      Identify and briefly describe two implications for the U.S. P&C insurance industry of the Dodd-Frank Wall Street Reform and Consumer Protection Act.

2. (1.5 points)

Identify two Canadian cases related to an insurer's duty to defend and describe the court's decision in each case.

3. (1.25 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. (0.75 point)

Briefly describe three justifications presented by the Court for establishing the cap.

b. (0.5 point)

Identify two types of tort for which the cap on non-pecuniary damages does not apply.

4. (3 points)

In the landmark case British Columbia v. Imperial Tobacco Canada Ltd., the government of British Columbia was seeking to recover money spent treating diseases caused by exposure to tobacco products from the manufacturers of those products under the Tobacco Damages and Health Care Costs Recovery Act.

a. (1.5 points)

Identify and briefly describe the three bases on which the defendants were challenging the constitutional validity of the Tobacco Damages and Health Care Costs Recovery Act.

b. (1.5 points)

For each answer in part a. above, briefly describe the outcome of the appeal and the reason behind it.

5. (2 points)

In order to reduce automobile insurance premiums in Ontario the P&C insurance industry has been exploring ways to reduce costs in the litigation system.

Develop a proposal for tort reform consisting of four changes to the current system. Briefly explain why each change would reduce expected losses.

6. (2 points)

   a. (0.5 point)

   Explain why the asbestos litigation system has been an inefficient mechanism for providing compensation to victims of asbestos-related disease.

   b. (1 point)

   A proposed U.S. federal reform to solve the asbestos litigation crisis is the trust fund approach. Fully describe this approach.

   c. (0.5 point)

   Identify two concerns with the trust fund approach to asbestos litigation.

7. (1 point)

A company has submitted a rate filing for a high-risk auto product in the province of New Brunswick. The company's return on equity (ROE) target for this line is 15%. The regulator is challenging the 15% ROE as excessive and suggests that a target of 10% is more appropriate.

Provide two arguments defending a 15% ROE target.

8. (2.5 points)

A personal lines pricing actuary who is working for a large insurance company in the province of Ontario, is asked by management to review three opportunities presented below.

Opportunity A: A broker has a contract with the company and believes there is an opportunity to target young drivers in the more affluent areas of Toronto. The broker wants to offer these drivers a quick and superior quoting service and policy issuance process based on the average income in their postal code.

Opportunity B: The CEO of the insurance company wants to target customers who have personal property policies with the company. To do so, the CEO suggests offering a multi-line discount of 10% on the auto policy. The historical experience of these customers is reviewed and they are found to indeed have better auto loss experience.

Opportunity C: A combination of competitive analysis and loss experience shows that the company is underpriced in the city of Hamilton but overpriced in the London area. The company would like to increase rates in Hamilton by 10%, and reduce rates in London by 5%. The overall impact of these changes is 0%.

For each opportunity, answer the following:

a. (1 point)

Explain whether the opportunity is permissible according to Ontario regulations.

b. (1.5 points)

If the opportunity is permissible, identify three types of actuarial information relevant to this specific change that must be provided to the Financial Services Commission of Ontario (FSCO) to obtain approval.

9. (1.5 points)

    a. (0.75 point)

       Identify three main areas on which Canadian insurance regulation is focused.

    b. (0.75 point)

       Identify three duties of the audit committee.

10. (2 points)

Florida Insurance Commissioner, Kevin McCarty, questioned the social validity of using credit-based insurance scoring on the basis that it is unfairly discriminatory.

a. (0.5 point)

Identify two historical examples that support his conclusions.

b. (0.75 point)

Identify three segments of society that are impacted by unfair discrimination in credit-based risk rating.

c. (0.75 point)

Assuming that the use of credit-based insurance scoring gains regulatory approval, briefly describe three potential problems with using credit-based data.

11. (2 points)

The Property and Casualty Insurance Compensation Corporation (PACICC) was established to protect policyholders and claimants in the event of an insurer insolvency.

a. (1 point)

In the event of an insolvency and assuming no payment has been made by the insolvent insurer, calculate the amount of recovery to which each of the following policies is entitled from PACICC with respect to claims:

    i. (0.25 point) An auto policy in Manitoba has a collision deductible of $500. The policy incurred a collision ground-up loss of $20,000.

    ii. (0.5 point) An auto policy in Ontario has a collision deductible of $500 and a third party liability limit of $1,000,000. The policy incurred a collision ground-up loss of $30,000 and a third party liability ground-up loss of $300,000. These two losses were from separate accidents.

    iii. (0.25 point) A personal property policy in Alberta has a deductible of $1,000 and a limit of $1,000,000. It incurred a ground-up loss of $300,000.

b. (0.5 point)

In the event of an insolvency in the fall of 2013, calculate the amount of recovery to which each of the following policies, both issued in summer of 2013, is entitled from PACICC with respect to unearned premium:

    i. (0.25 point) A fidelity policy in Alberta with an unearned premium of $300 as of the date of insolvency.

    ii. (0.25 point) An auto policy in Alberta with an unearned premium of $1,500 as of the date of insolvency.

c. (0.5 point)

Briefly describe the two conditions that must be met before PACICC has financial responsibility in connection with an insurer's insolvency.

12. (2 points)

The following information is provided for two insurance companies:

	Company A	Company B
2012 Written Premium	$7,800,000	$15,000,000
% Growth in Premium in 2012	15%	5%
Years since inception	7	12
Number of jurisdictions	2	10

a. (1 point)

Identify and briefly describe two risks that could lead to the wind-up of an insurance company.

b. (1 point)

Using the information above, discuss which company would be considered a higher risk for wind-up.

13. (2.25 points)

The Agricultural Policy Framework (APF) was developed as a risk management approach for the Canadian agricultural sector. One of the risk management programs under the APF is Production Insurance.

a. (0.75 point)

Identify three provisions of the Production Insurance program that help control moral hazard.

b. (0.75 point)

Briefly explain how each provision in part a. above reduces moral hazard.

c. (0.75 point)

Identify three principles, other than minimizing moral hazard, that have guided the design of the APF.

14. (3.5 points)

    a. (1 point)

        Identify four reasons why offering flood insurance may be beneficial as part of the typical Canadian homeowner's policy.

    b. (2 points)

        An actuary has been hired to design a residential flood insurance program for the Canadian market. Describe four considerations of the actuary's proposed program.

    c. (0.5 point)

        Briefly explain how flood insurance could increase the risk of moral hazard on the part of:

        i.   The insured.
        ii.   The government.

15. (2 points)

    a. (1 point)

        Briefly describe the four criteria that must be met for a terrorism event to be certified under current Terrorism Risk Insurance Act (TRIA) rules.

    b. (0.5 point)

        Identify two ways the private market could replace TRIA.

    c. (0.5 point)

        Describe two arguments to support the position that TRIA is not insurance.

16. (2.5 points)

In cases of disability, an employee benefit plan is deemed to be the "first payer" and Employment Insurance (EI) is deemed to be the "second payer." In recognition, employer EI premiums are reduced if a short-term disability plan is approved by and registered with Human Resources and Social Development Canada.

a. (1 point)

Briefly describe four minimum requirements for an employee benefits plan to qualify for EI premium reduction.

b. (0.75 point)

Identify three examples of acceptable arrangements to return, directly or indirectly, a portion of the premium reduction to the employees.

c. (0.75 point)

Briefly describe three circumstances under which a potential claimant will not qualify for regular EI benefits.

17. (1 point)

The following is an excerpt from the actuarial opinion required by the Office of the Superintendent of Financial Institutions (OSFI), as part of the Annual Return.

	Carried in Annual Return ($000s)	Actuary's Estimate ($000s)
Gross policy liabilities in connection with unearned premium		$150,000
Net policy liabilities in connection with unearned premiums		$134,000
Gross unearned premium	$176,000	
Net unearned premium	$155,000	
Premium deficiency	X	
Other net liabilities	0	
Deferred policy acquisition expenses	Y	
Maximum policy acquisition expenses deferrable		Z
Unearned commissions	$1,000	

The accounting department's initial estimate of deferrable expenses is $22,500.

Determine X, Y and Z in the table above.

18. (3 points)

A reinsurer is entering into a commutation agreement with a primary insurer. The following information is available about the transaction as at December 31, 2012.

Period	Estimated Payment to Reinsurer ($)
2013	$350,000
2014	$150,000

Assume the following:
- Required capital is based on a regulatory approach.
- The company must hold target capital equal to 180% of required capital.
- A margin of 10% of the claims liability is required.
- The discount rate is 1%.
- The risk cost of capital rate is 5%.
- All payments are made in the middle of the year.

a. (2.5 points)

Estimate the commuted value of the claims.

b. (0.5 point)

Identify an advantage and a disadvantage of this transaction from the primary insurer's perspective.

19. (3.5 points)

A company began writing personal property and liability lines of business on January 1, 2012. The personal property line of business had the following losses at December 31, 2012:

Property Line of Business – 2012 Loss Year					
Gross Layer			Net Layer		
Paid Loss ($000s)	Incurred Loss ($000s)	Ultimate Loss ($000s)	Paid Loss ($000s)	Incurred Loss ($000s)	Ultimate Loss ($000s)
$2,000	$7,500	$10,000	$1,200	$4,500	$6,000

Notes on the property line of business:
- The claims development Margin for Adverse Deviation (MfAD) is twice as large as the reinsurance recovery MfAD.
- The company uses the same margins and payment pattern for their gross, ceded, and net reserve layers.
- The ceded claims discounted at 5% are $3,012.23.
- The net claims discounted at 5% are $4,518.35.
- The net claims discounted at 4% are $4,571.88.
- The net claim liability including margins is $5,023.72.
- The cumulative accident year payment pattern for the property line of business is as follows:

Months	Percentage paid
12	20%
24	50%
36	90%
48	100%

- Assume that all payments are made in the middle of the year.

(19 cont.)

Other information:
- The portfolio yield rate on the assets that are assumed to be backing all claims liabilities is 6%.
- The portfolio of investment assets contains only zero-coupon bonds maturing in 3 to 5 years with a modified duration of 3.5 years.
- The liability line of business has a 10-year assumed payment pattern with a modified duration of 6.5 years.

a. (1 point)

Identify and briefly explain two considerations that would cause the actuary to consider a discount rate other than the assumed portfolio yield rate of 6% for the liability line of business.

b. (2.5 points)

Assuming that the actuary decides that a 5% discount rate and a 1% investment return MfAD is appropriate, calculate the gross discounted claims liability, including margins, for the property line of business.

20. (3.5 points)

The following information is available for an insurance company as at December 31, 2012.

Line of Business	Net Unearned Premium ($000s)	Selected Undiscounted Loss Ratio	Discount Factor to Evaluation Date
Auto – Physical Damage, AB, & TPL	$30,000	0.95	0.95
Personal – Property & Liability	$20,000	0.85	0.82
Facility Association	$2,000	0.97	1.00

- Selected maintenance expense ratio = 5% of premiums
- Selected internal adjustment expense ratio = 14% of losses
- Contingent commissions = 3% of premiums
- Deferred Policy Acquisition Expenses (DPAE) ($000s) = $7,500
- Discount factor from average accident date to evaluation date = 0.98

a. (2.75 points)

Calculate the Premium Deficiency for page 20.20 of the P&C-1.

b. (0.75 point)

Fully explain how evaluating this company's premium deficiency by line of business could result in a different equity in unearned premium (EQUP).

21. (1.5 points)

Given the following information regarding an insurance company's paid losses and discounted claim liabilities:

Paid Losses During Calendar Year (CY) ($000s)				
	Accident Year			
As of CY	2010	2011	2012	Total
2010	$52,000			$52,000
2011	$21,000	$51,000		$72,000
2012	$18,000	$33,000	$67,000	$118,000

Discounted Claim Liabilities ($000s)					
	Accident Year				
As of CY	2010	2011	2012	Total	Annual Yield
2010	$59,000			$59,000	3.50%
2011	$35,000	$63,000		$98,000	4.50%
2012	$27,000	$45,000	$74,000	$146,000	4.00%

Excess (Deficiency) During CY 3 – By Accident Year ($000s)					
Accident Year	Paid Losses During 2012 (1)	Discounted Claim Liabilities 2012 (2)	Discounted Claim Liabilities 2011 (3)	Investment Income in 2012 on unpaid claims (4)	Excess (Deficiency) During 2012 (5)
2010	$18,000	$27,000	$35,000	A	B
2011	$33,000	$45,000	$63,000	C	D
2012	$67,000	$74,000	-	E	-

a. (1.25 points)

Calculate the cumulative excess/deficiency ratio for accident year 2010 as of December 31, 2012.

b. (0.25 point)

One way to account for the time value of money is to explicitly calculate an amount of investment income as in the table above. Briefly describe another way to account for the time value of money when calculating excess/deficiency amounts.

22. (2 points)

The following table summarizes the claim liability estimates of the Appointed Actuary of a P&C insurance company:

Undiscounted Estimate of Claim Liability	$111,453
Discounted Estimate of Claim Liability Excluding PfADs	$103,345
PfAD – Investment Return Rate	$500
PfAD – Claims Development	$7,300
PfAD – Reinsurance Recovery	$4,000

The income tax rate is 35% and the reported reserve is $120,000.

a. (0.5 point)

Describe how a "future tax temporary difference" may arise.

b. (0.5 point)

It is anticipated that in most cases the effect of discounting the asset for future income taxes would not be material to the valuation of a P&C insurer. Define the concept of materiality according to the Canadian Standards of Practice.

c. (1 point)

Calculate the estimated effect of discounting the asset for Future Income Taxes (presently identified as Deferred Tax Assets on the P&C-1).

23. (1.75 points)

   a. (0.75 point)

      According to MSA Research, identify three aspects of financial strength that are not captured in the OSFI regulatory solvency ratios and tests.

   b. (0.5 point)

      Given the following information:

Invested assets at Dec 31, 2011	$182,000
Invested assets at Dec 31, 2012	$198,000

        • Net Investment Income: $20,000 for 2011 and 2012
        • Other Comprehensive Income: $0 in 2012.

      Calculate the MSA Adjusted Investment Yield for 2012.

   c. (0.5 point)

      Identify the two components of the MSA Overall Diversification Score.

24. (2.5 points)

    a. (1 point)

        Describe two reasons that almost all property-casualty insurers are rated by rating agencies compared to a small percentage of companies from other industries.

    b. (0.75 point)

        Capital standards are different among the rating agencies. Identify the capital model used by the following:
           i.   A. M. Best
          ii.   Moody's
        iii.   Standard & Poor's

    c. (0.75 point)

        Fully describe the capital model used by <u>one</u> of the rating agencies in part b. above.

25. (3 points)

An insurance company was incorporated on January 1, 2012 and purchased the following three bonds in 2012 to support its liabilities:

Asset	Classification	Coupon received in 2012 ($000s)	Amortized value as at December 31, 2012 ($000s)	Market value as at December 31, 2012 ($000s)
AAA Bond	Held to Maturity	75	1,800	1,500
BBB Bond	Available for Sale	200	7,000	7,500
CCC Bond	Held for Trading	125	3,000	2,900

Assume the company is an income-tax exempt organization.

a. (0.5 point)

Calculate the investment income shown in the 2012 Income Statement.

b. (0.75 point)

Determine the value of each bond to be recorded in the 2012 financial statement.

c. (0.25 point)

Determine the total Accumulated Other Comprehensive Income for 2012.

d. (1.5 points)

Assuming that market interest rates decrease in 2013, indicate the impact on Net Income for each of the three asset classifications. Briefly describe your reasoning for each answer.

26. (3 points)

Given the following information for an insurance company:

	Market Value ($000s)	Book Value ($000s)	Duration
Local government bonds	$50,000	$55,000	6.8
Investment grade bonds	$190,000	$178,000	5.6
Below investment grade bonds	$30,000	$28,000	3.4
Non-affiliated preferred stocks	$3,500	$3,000	7.6
Non-affiliated common stocks	$50,000	$42,000	--
Cash	$2,000	$2,000	--
Receivable from agents	$1,800	$1,800	--

Ceded assets	Balances ($000s)	Reserve Deficiency ($000s)	Rating	Capital Factor
Reinsurance Company A	$50,000	$850	A++	2%
Reinsurance Company B	$20,000	$2,000	A	6%
Reinsurance Company C	$5,000	$530	B+	20%

Capital factor for:	
Receivable from agents	5%
Spread of risk factor	1.35
Gross PML ($000s)	$35,000
Liquid assets ($000s)	$700,000
Reinsurance dependence factor	1.25

Unadjusted surplus ($000s)	$78,000
Adjusted surplus ($000s)	$66,000

Net required capital for:	($000s)
Fixed income securities risk	$4,577
Equity securities risk	$10,842
Interest rate risk	$1,839
Loss & LAE reserves risk	$41,000
Net premiums written risk	$18,000
Business risk	$35

Calculate the A.M. Best's Capital Adequacy Ratio (BCAR) and briefly comment on the capital strength of the company based on the calculated ratio.

27. (2.75 points)

    a. (1.5 points)

       Identify and briefly explain the A. M. Best's three keys to strong catastrophe risk management.

    b. (1.25 points)

       Fully describe the methodology used in the A. M. Best's Capital Adequacy Ratio (BCAR) model for the natural catastrophe stress test.

28. (4 points)

    a. (1.5 points)

       Describe the three pillars of the Solvency II framework.

    b. (1 point)

       OSFI's Property & Casualty Minimum Capital Test Advisory Committee outlines the current multi-level approaches to insurer supervision for federally-regulated insurers. Fully describe OSFI's framework.

    c. (1.5 points)

       Compare and contrast the frameworks described in part a. and b. above.

29. (2 points)

A federally-regulated Canadian P&C insurer's Dynamic Capital Adequacy Testing (DCAT) results as of December 31, 2012 for the three most adverse scenarios are shown below. Assume the Minimum Capital Test (MCT) ratio and surplus shown below reflect the most adverse results during the forecast period.

	Base Scenario	Frequency/ Severity (Loss Ratio)	Misestimation of policy liabilities (Unpaid Claims)	Premium Volume (Decrease)
MCT ratio	229%	157%	137%	200%
Surplus ($000s)	$400,000	$275,000	$240,000	$350,000

a. (0.5 point)

Describe what a base scenario is in the context of the DCAT.

b. (0.5 point)

Determine whether or not the company is in "satisfactory financial condition." Briefly explain your answer.

c. (0.5 point)

Briefly describe two possible ripple effects that the actuary may consider under the Premium Volume (Decrease) scenario.

d. (0.5 point)

Briefly describe two possible management actions that the actuary may recommend under the Misestimation of Policy Liabilities scenario.

30. (1.25 points)

    a. (0.75 point)

       Briefly describe the purpose of the following three regulatory capital thresholds used by the Office of the Superintendent of Financial Institutions (OSFI) to assess the adequacy of the Minimum Capital Test (MCT) ratio for federally regulated insurers:

         i. Minimum Capital Ratio
        ii. Supervisory Target Capital Ratio
       iii. Internal Target Capital Ratio

    b. (0.5 point)

       Describe the responsibilities of the insurer when the MCT ratio falls under its Internal Target Capital Ratio.

31. (1.75 points)

OSFI expects insurers to develop a formal stress testing process as part of a company's financial risk management.

a. (0.50 point)

Briefly describe two purposes of such stress testing.

b. (1.25 points)

Describe and contrast "scenario testing" and "sensitivity testing."

32. (1.5 points)

ABC Insurance Company purchases a catastrophe treaty on January 1 at a rate of 5% of gross earned premium. This treaty will cover losses resulting from a catastrophic event generating a loss exceeding 10% of gross earned premium. The treaty limit is 100% of gross earned premium.

a. (0.75 point)

If no catastrophe occurs, briefly explain how the purchase of this reinsurance treaty will affect the company's:
  i. Surplus
  ii. Net loss reserve
  iii. Investment income

b. (0.75 point)

If there is a catastrophe generating a loss of 50% of gross earned premium, briefly explain how the purchase of this reinsurance treaty will affect the company's:
  i. Surplus
  ii. Net loss reserve
  iii. Investment income

Assume that non-catastrophe loss levels are unaffected by the catastrophe event.

33. (2.5 points)

An insurance company recently acquired a large portfolio with significant earthquake exposures. Prior to this acquisition, the company's book had no such exposure. Describe the key principles the company should consider to meet the expectations set out in OSFI's earthquake guideline.

34. (2.5 points)

    a. (1 point)

    Briefly describe four qualifications, other than being an FCIA, that are expected of a new Appointed Actuary, as outlined by OSFI.

    b. (1 point)

    Describe the communication requirements for each of the following parties after the appointment of an actuary has been revoked:

        i. (0.5 point)

        The actuary whose appointment has been revoked.

        ii. (0.25 point)

        The company.

        iii. (0.25 point)

        The actuary who intends to become the new Appointed Actuary of the company.

    c. (0.5 point)

    Describe the conditions that a company's CFO must satisfy to become the Appointed Actuary.

35. (1.5 points)

The actuary of a federally-licensed insurer is preparing the draft of the Appointed Actuary's report for the financial year ending December 31, 2012. For each of the following hypothetical scenarios, identify and briefly explain the actions that the actuary should take.

a. (0.5 point)

There was a big ice storm in Calgary, Alberta between January 15 and January 17, 2013. The company has minimal exposure in Alberta.

b. (0.5 point)

The actuary is notified that the claims from the last week of December 2012, were missing in the database that the actuary used for the reserve analysis. The error has been corrected as of February 1, 2013.

c. (0.5 point)

There was a ruling on the Minor Injury Guidelines (MIG) in Ontario on January 15, 2013, which resulted in approximately 30% of injuries no longer being capped.

36. (1.5 points)

With regard to the Canadian Institute of Actuaries' publication "Educational Note: Discounting":

a. (0.5 point)

Explain the difference between "present value" and "actuarial present value."

b. (1 point)

Identify four considerations in the determination of return rate on assets underlying the discounting of policy liabilities.

Exam 6 - Canada
Regulation and Financial Reporting (Nation Specific)

POINT VALUE OF QUESTIONS

QUESTION	VALUE OF QUESTION	SUB-PART OF QUESTION						
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	2.00	1.00	1.00					
2	1.50	1.50						
3	1.25	0.75	0.50					
4	3.00	1.50	1.50					
5	2.00	2.00						
6	2.00	0.50	1.00	0.50				
7	1.00	1.00						
8	2.50	1.00	1.50					
9	1.50	0.75	0.75					
10	2.00	0.50	0.75	0.75				
11	2.00	1.00	0.50	0.50				
12	2.00	1.00	1.00					
13	2.25	0.75	0.75	0.75				
14	3.50	1.00	2.00	0.50				
15	2.00	1.00	0.50	0.50				
16	2.50	1.00	0.75	0.75				
17	1.00	1.00						
18	3.00	2.50	0.50					
19	3.50	1.00	2.50					
20	3.50	2.75	0.75					
21	1.50	1.25	0.25					
22	2.00	0.50	0.50	1.00				
23	1.75	0.75	0.50	0.50				
24	2.50	1.00	0.75	0.75				
25	3.00	0.50	0.75	0.25	1.50			
26	3.00	3.00						
27	2.75	1.50	1.25					
28	4.00	1.50	1.00	1.50				
29	2.00	0.50	0.50	0.50	0.50			
30	1.25	0.75	0.50					
31	1.75	0.50	1.25					
32	1.50	0.75	0.75					
33	2.50	2.50						
34	2.50	1.00	1.00	0.50				
35	1.50	0.50	0.50	0.50				
36	1.50	0.50	1.00					

TOTAL   79.00

Exam 6-Canada, Fall 2013

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

Starting in Fall 2013, the CAS began offering Exam 5 every sitting which greatly reduced the number of extremely unprepared candidates writing Exam 6-Canada however, it was clear that a high proportion of candidates did not read many of the new readings on the syllabus. 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 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. This does not mean that only "must-know" topics will be tested; it only means the MQC score for each question will be related to the depth of knowledge required on the topic.

In general, borderline and passing candidates did as expected throughout the exam. For example, candidates received a low percentage of available points on the two A. M. Best questions however, the MQC score for these questions was fairly low and thus, candidates did as anticipated. On the other hand, candidates were expected to have detailed knowledge of the OSFI Target Capital paper so the MQC score for this question was set fairly high. Again, candidates did as anticipated and obtained most of the points available on this question.

Due to the size of the syllabus, every topic cannot be tested every year. Just because a topic has not been tested in the past does not mean that it will not be tested on a given exam. Conversely, just because a topic is tested almost year does not mean that it will be tested on a given exam.

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. Topics of lesser importance remain on the syllabus and will be continue to be tested but the knowledge required of passing candidates, as indicated by the MQC score assigned to each question, is lower. In general, Section D and Section C P&C-1 questions are often "must-know" questions while Section B questions are less important. Candidates are also strongly advised to read the source material to make their own notes and not rely on completing old exam questions as a sole method of study.

Question 1

Answer key:

a) The United States Supreme Court held that insurance was not commerce and that state insurance regulation did not violate the Privileges and Immunities Clause of the Fourteenth Amendment. The Court concluded, therefore, that state insurance regulation was not significantly constrained by the United States Constitution, and that there was no basis for federal regulation of insurance.

   As a result of the judgment, the states kept their emerging primacy in regulating the industry. In other words, the state-based insurance regulatory scheme rose to primacy. The various state insurance regulators sought to bulwark their authority and almost immediately began to coordinate their activities and pool their resources. The National Association of Insurance Commissioners was formed for this very purpose.

b) Any two of the following implications; for each implication need to identify and briefly describe
   a. Establishes the Federal Insurance Office ("FIO") under the U.S. Department of Treasury, charged with studying and collecting information on the insurance industry and the state insurance regulatory system, and drafting a proposed federal insurance regulatory framework;
   b. Establishes the Financial Stability Oversight Council ("FSOC"), which is charged with monitoring the financial services markets, including the insurance industry, to identify potential risks to the financial stability of the United States;
   c. The FSOC is authorized to require a state insurance regulator to either apply new or heightened financial standards on insurance companies, or explain to the FSOC in writing why the regulator chose not to apply such standards;
   d. The FSOC may declare that a "nonbank financial company" – including an insurance company under certain circumstances – poses a systematic risk such that it is subject to supervision by the United States Federal Reserve System;
   e. Requires single-state regulation of surplus lines insurance placements and requires all states to apply uniform eligibility criteria for surplus lines insurers; and
   f. Mandates certain requirements for reinsurance credits and generally preempts non-domiciliary state laws to insurers with respect to certain reinsurance issues

Actual candidate answer for full marks:

(a) In Paul v. Virginia, insurance was ruled as not inter-state commerce, and as a result, is subject to individual state regulation, not federal regulation.

States have set up their own insurance commissions which are members of NAIC to try to bring uniformity to insurance regulation.

(b) Federal Insurance Office was formed with the goal of collecting information about the insurance industry and developing a federal regulatory framework.

Federal Stability Oversight Committee was founded to oversee, identify and threats to the financial stability of the US economy.

Examiner's report:

(a) This question asks to describe the <u>ruling</u> and discuss the <u>implication</u> of the case. However, some candidates spent a lot of effort on describing the case itself with little explanation on the implication. Candidates that focused on the ruling and implication generally performed well on this part.

(b) Candidates did not do well on this part in general. It may be due to the fact that material is U.S. related and requires some memorization.

Question 2
Answer key:
Any 2 of the following:

Sansalone v Wawanesa
- Insurer denies a duty to defend because sexual conduct involved came under the exclusion involving sexual or criminal acts
- no duty to defend in cases involving intentional sexual acts as coverage is excluded

Nichols v American Home
- Insured solicitor sues insurer for the unreimbursed settlement costs in a case where he is unsuccessfully sued for fraud
- no duty to defend in cases involving fraudulent acts or omissions if they are out of the scope of the policy.

Broadhurst & Ball v American Home
- Both have a duty to defend and costs should be split equally
- if the potential judgment puts an insurer at risk then all insurers with a duty to defend

Alie v Bertrand
- defective concrete requires replacement of basements of houses
- insurers who issue excess and/or umbrella policies that follow the form of the underlying policy are seen as having a duty to defend

Actual candidate answer for full marks:

- Sansaline vs Wawanesa

    No defence for sexual assault as not covered by policy.

- Nichols vs American Home

    No defence for fraud as not covered by policy

Examiner's report:

This question asks to <u>identify the case</u> and <u>describe the court decision,</u> and there are four cases in Landmark Legal that candidates can choose from. However, some candidates spent a lot of efforts on describing the case itself with little explanation on the court decision and the underlying rationale of the court decision. In general, candidates did well on this question. Some candidates were not able to give the full name of the legal cases; in this case, providing a brief description of the case serves the purpose to "identify" the case.

Question 3

Answer key:

a) Three of the following four reasons:

    i.   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

    ii.   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

    iii.   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

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

b)

    i.   Types of torts:

        1. Sexual assaults

        2. Defamation

Actual candidate answer for full marks:

a)

- The plaintiff will be fully compensated for all future loss of income and pecuniary losses
- Claims for pain & suffering (non-economic damages) are limitless
- Amount for non-economic damages are not compensatory, they are merely to make life more endurable

b)

- Sexual Assualt

- Defamation

Examiner's report:
The trilogy is a primordial part of the syllabus and has been asked for many years. Therefore candidate answers were generally quite good as most people know how to answer.

Question 4
Answer key:
a) The 3 basis :
- a. Extra-Territoriality (ultra vires)
  - i. The pith and substance of the legislation must be in relation to matters falling within the field of provincial legislative competence to be valid.
- b. Judicial Independence
  - i. Consists essentially in the freedom to render decisions based solely on the requirements of the law and justice and to be left free to act without improper interference from any other entity
- c. Rule of law
  - i. 3 principles :
    1. The law is supreme over officials of the government as well as private individuals, and thereby preclusive of the influence of arbitrary power (legislation be applied to all of those, including government officials, to whom it, by its terms, applies)
    2. Requires the creation and maintenance of an actual order of positive laws which preserves and embodies the more general principle of normative order (legislation must exist)
    3. Requires that the relationship between the state and the individual… be regulated by law (state official's actions be legally founded)

b) Outcome and reasons :
- a. The Act is not invalid by reason of extra-territoriality. The cause of action that is the pith and substance of the Act serves exclusively to make the persons ultimately responsible for tobacco-related disease suffered by British Columbians – namely the tobacco manufacturers, who, through their wrongful acts, caused those British Columbians to be exposed to tobacco – liable for the costs incurred by the government of British Columbia in treating that disease. There are thus a strong relationship among enacting territory (British Columbia), the subject matter of law (compensation for the government of British Columbia's tobacco-related health care costs) and the persons made subject to it (the tobacco manufacturers ultimately responsible for those costs), such that the Act can easily be said to be meaningfully connected to the province.

- b. The Act does not violate the independence of the judiciary. The fact that the Act shifts certain onuses of proof or limits the compellability of information that the appellants assert

is relevant does not in any way interfere, in either appearance or fact, with the court's adjudicative role or any of the essential conditions of judicial independence (court can still independently determine the applicability of the Act, independently assess the evidence led to support and defend that claim, independently assign that evidence weight and then independently determine whether its assessment of the evidence supports a finding of liability)

    c.   The Act does not implicate the rule of law and is not unconstitutional by reason of interference with it. The Act did not breach the following requirements of legislation : prospectively, generality in character, not confer special privileges on the government and ensure a fair civil trial.

Actual candidate answer for full marks:

(a) The act was unconstitutional by means of:
   (i) Extra-territoriality – they thought that act encompasses multiple provinces, not just the province of BC, so it is not with the province's jurisdiction.
   (ii) Violate judicial independence – that it implies on the judicial system such that they are no longer making independent decisions.
   (iii) Imposes on rule of law – that it was basically already decided what would happen in case.

(b) The appeal found that the act was not unconstitutional on any of those grounds.
   (i) Under (i), it was found that the act was by pith and substance under the property and civil rights of the province.
   (ii) Under (ii), it was found that even though the duty of proof has shifted to the tobacco companies, judges will still evaluate evidence determine its bindings independently.
   (iii) Under (iii), it was found that the defendants will be given a fair trial.

Examiner's report:

(a) Most candidates were able to identify at least two bases out of three. However, some were not able to provide further explanation on the bases that they identified.
(b) For candidates who correctly identified the bases in part (a), they performed well in describing the outcome and the underlying reason.

Question 5
Answer key:

4 of the following:
- Modify joint-several liability rule: reduce lawyers search for "deep pocket" which will reduce defense expenses
- Abolish collateral source rule: prevent double recovery which would result in lower insurance premiums
- Eliminate class actions: reduce defense costs / eliminate claims without merit that have been included

- Replace gross earnings by net earnings: prevent insured from recovering more for loss of income than if they were working
- Increasing standards for testing vicarious liability
- Severe sanctions on frivolous lawsuits: reduce the frivolous lawsuits
- Elimination of prejudgment interest on general damages
- Cap non-economic/punitive damages
- Introduce No-fault system so injured claimants are compensated according to schedule without the right to sue.
- Increase the threshold for the tort system. This limits the number of claims that go to court so litigation cost is reduced.

Actual candidate answer for full marks:
Change joint-and-several liability to proportional liability. This would reduce losses because person potentially at fault would not have to pay the entire compensation if other could not.

Coordinate payment with collateral source to prevent double recovery and make sure injured persons do not receive more than what they are should be compensated.

Use net basis vs gross basis because injured people does not have similar cost living when they do not work.

Vicarious liability should be eliminated as people who do not have any fault in the case should not have to pay.

Examiner's report:
Candidates performed well on this question. However, some candidates were confused between the Tort System and Injury System. Those candidates proposed to make reform Ontario Auto Accident Benefits coverage, including change to minor injury claims guideline, reducing coverage benefits limits. Those proposed changes are related to Ontario Injury System from the Five Year Review reform paper that was on the 2012 syllabus and are not related to the Tort System.

Question 6
Answer key:
a) Either one of the following with description:

Defense costs and plaintiff's attorney fees consumed a large part of total payments
At least half of the total claims paid by defendants and their insurers is related to nonmalignant claims
   b) Establish a no-fault trust from which claimants meeting asbestos exposure and medical criteria would have been compensated for their injuries
   c) 2 of the following:
- How many claims of various disease types will be filed?
- Will the medical and exposure criteria be appropriate to identify victims?
- Is funding adequate?
- Are awards appropriate?
- Is allocation of funding from various contributors adequate?
- Should the federal government contribute to the fund?

- Will the fund be operated efficiently?
- Will any statute withstand constitutional challenges?

Actual candidate answer for full marks:
(a) Because high part of the cost goes to lawyer rather than to compensate injured.
(b) Fair Act (no passed)

No-fault fund of 140B constituted of insurers, defendant and existing bankruptcy trust to compensate injured meeting medical and exposure criteria.

(c) Would the fund is sufficient?

Would the medical criteria would be efficient to identify injured parties?

Examiner's report:
(a) Candidates performed well on this part in general.
(b) Some candidates spent a lot of effort in describing how the trust fund was formed. Candidates are expected to provide full explanation on how this no-fault trust fund compensates claimants and the underlying criteria for identifying claimants that are eligible for compensation.
(c) Candidates performed well on this part in general.

Question 7

Answer key:

Companies that insure less conventional risks are pursuing a <u>higher-risk business strategy</u> and would <u>require higher returns</u>

Also allow:
Higher uncertainty requires higher returns.

Restricting ROE to averages or predetermined range leads to <u>availability concerns</u> and will ultimately result in higher risk insurance <u>consumers experiencing difficulty finding coverage</u>
Mention either availability or difficulty finding coverage – either one is worth full marks.

Also allow:

Other financial institutions with similar levels of risk allow returns in the same range for investors.

Actual candidate answer for full marks:
- The product is high-risk, thus in order to offer competitive returns to investors the ROE should be comparable to similar levels of risk in the market

- Offering an ROE below market-perceived levels will lead to lack of investment, lower capital in the insurer which is needed to support the high risk and thus a decrease in the availability of insurance.

Examiner's report:
This is a simple question, with several possible answers. Candidate could reference the paper N&L PUB Property however, many other answers were accepted by candidates who drew on other areas of basic finance knowledge.

Question 8

Answer key:

Opportunity 1:
1. This is not permissible. According to Regulation 7/00 (UDAP), credit information is defined to include income. UDAP prohibits using credit information to treat customers differently.
2. Not applicable due to 1

Opportunity 2:
1. Yes, this is allowed, there is no barrier to offering a discount for combined policies and it is justified by experience
2. Information in **section 5** is required (three required for full points):
   a. Approach in costing and narrative of process
   b. Justification based on lower expenses, costs, or loss costs
   c. Any external data used, source and applicability
   d. Written premium distribution for discounts
   e. Exposure distribution for discounts
   f. Current and proposed distribution of insurer's book to determine average premium change
   g. All assumptions and detailed calculations

Opportunity 3:
1. Yes. There is no barrier to changing territorial differentials
2. Information in **section 4.k** is required (three required for full points):
   a. Territorial indications using insurers own data
   b. Any external data used, source and applicability
   c. Current indicated and proposed territory differentials by coverage
   d. Written premium distribution by coverage and territory
   e. Exposure distribution by coverage and territory
   f. Credibility procedure if used
   g. Changes to approach or underlying data from prior filing
   h. Offbalancing – all data used and calculation of offbalance
   i. Judgements used in offbalancing process

Actual candidate answer for full marks:

Part A.
   A. Not permissible. Changes to the ON regulation regarding credit information meant that insurers couldn't provide different treatment for quotes and renewal applications based on credit information.

   B. Permissible. A discount can be offered if the target group has lower costs due to favourable experience.

   C. Permissible. The insurer is allowed to provide different rates for territories based on experience and an approved methodology.

Part B.

B. The number of exposures affected, the impact of the discount on premium. The written premium for the groups receiving and not receiving the discount.

C. The methodology used for risk classification for territories e.g. GLM and the results. The written / earned premium for each territory. The overall and individual impacts of the risk classification changes.

Examiner's report:
This is a very important question for any candidate practicing in Canada. The candidates need to know what is legal for auto insurance in Ontario.

For part A. it is important they understand what is allowable for quoting practices, as well as pricing. We also wanted the candidates to mention that income is considered part of the definition of credit information, for full marks.

For part B. there are many possible answers, and many outside the key were acceptable. The question did specify that the answers should be specific to the particular change discussed, not just filings in general.

Question 9
Answer key:
a. Solvency, Canadianization, creation of tax revenues (need to specify **tax** revenues), promote market integrity / improve contract form, promote intermediary honesty / competence.

Also allow "protection of the insured / consumer".

b. audit committee
    i. review the annual statement
    ii. review such returns of the company the superintendent may specify
    iii. require management to implement and maintain appropriate internal control procedures
    iv. review such investments and transactions that could adversely affect the well-being of the company…
    v. meet with the auditor
    vi. meet with the actuary
    vii. meet with the chief internal auditor of the company

Actual candidate answer for full marks:
a.
    1. Regulation regarding solvency of the insurer
    2. Creating tax revenue
    3. Promoting ownership of Canadian insures and local investment

b.
    1. Meet with actuary to discuss portion of annual report that relates to valuing policy liabilities
    2. Review the annual report before its presented to the directors
    3. Meet with auditor to discuss the fairness of the report

Examiner's report:

Foundational question which has been asked numerous times in the past. There are many possible answers out of which only 3 (each for A and B) were required. We did not require long answers for full marks.

Question 10
Answer key:
a. 1. 1930-1970 – several states used race as a life insurance rating factor – even today it is a mathematical fact that life expectancy differs for Caucasian by 5 years. Sound technically but "counter to equal protection for consumers" "not sound public policy".
2. HIPAA outlaw of the practice of using DNA testing for health insurance.

b. Recent divorces, recently naturalized citizens, elderly, disabled, religious sects, young, poor, ethnic groups (or race or minorities), don't use credit often.

c. Credit report errors, identity theft, proliferation of access to credit

Also allow: opaque to consumers, varies by company, impacted by decision unrelated to insurance risks (such as financing decisions), downturn in Economy.

Actual candidate answer for full marks:
a.
1. Use of race in life insurance
2. Use of medical / genetical records in life insurance

b.
1. Elderly
2. Newly naturalized
3. People with religious belief against credit

c.
1. Quality of data (a research shows that as many as 50% credit profile contained inaccurate information)
2. Economic downturn (will usually decrease average credit score – if insurer doesn't off-balance the change will result in a premium increase for insured. This may be true when the economic downturn is sudden and insurer doesn't have time to react).
3. Life changing event (people undergoing life changing even such as Identity Theft may be unfairly impacted).

Examiner's report:
Part A provides an important historical context for the McCarty paper.

For B, there were many possible answers which are fairly intuitive for candidates to remember. Most candidates got complete marks.

For C. there were again many possible answers accepted.

Question 11
Answer key:

A)

i) 0. Auto policies in MB is not subject to PACICC

ii) Because there are two separate loss occurrences, the loss amounts are not aggregated together and thus the PACICC limit of 250,000 is applied separately to each claim.
Total Recovery = min(250,000, 30,000 – 500) + min(250,000, 300,000) = 279,500

iii) Maximum recovery for Personal Property policy is $300,000.
Total Recovery = min(300,000, 300,000-1000) = 299,000.

B)
Note the effective dates are needed because prior to 1996, PACICC does not cover unearned premium.
1) 0. Fidelity policies are not covered under PACICC.
2) After 1996, PACICC will pay 70% of a maximum unearned premium of $1000.

Total recovery = min(700, 1500*0.7) = 700.

C)
i) Formal wining up order under the Federal Winding up and Restructuring Act
ii) Insurer must be a member of PACICC

Actual candidate answer for full marks:
a)
   i.   Since the auto insurance is provided by the government it is not a responsibility of PACICC. Recovery = $0
   ii.   Recovery = (30000-500)+250000 = $279,500
   iii. Personal property limit = 300k So recovery = 300,000 – 1,000 = $299,000

b)
   i.   Fidelity is not covered as a line of business by PACICC
   ii.   Max(0.7*1500,0.7*1000) = $700 recovered

c)
   ▪   Insurer must write a line of business that is covered under PACICC polies, so that is a member of PACICC
   ▪   Insurer must receive a windup order from OSFI/superintendent

Examiner's report:
The calculation parts in a and b were generally well answered, however many candidates did not know the exceptions for Manitoba and fidelity so points were lost here. For part c, knowledge about PACICC and the requirements for responsibilities during insolvency were not typically well understood by candidates.

Question 12
Answer key:

a) Insolvency risk - when assets become insufficient for an insurance company to meet its contractual and other financial obligations.

Liquidity risk - when it has sufficient assets to cover its obligations but there is a high level of risk those assets could disappear.

Note: need to accept wide range of answers for including insurance risk (reserving, pricing, catastrophe), market risk, operational risk, etc. – all the types of risk now spoken about in ORSA, economic capital modeling, ERM – they are all valid answers

b) Company A is more likely to wind up

3 of the following reasons (points for explanation only not identification since these are given in the problem)

   a. Size – Company A is smaller and could have less expertise and resources in management and also has less diversification benefits.

   b. Growth – Company A's 2012 growth was very aggressive. Rapid growth indicates aggressive expansion growth strategies where companies might be expanding in areas where underwriting experience is lacking

   c. Age – Company A is relatively young compared to Company B. New entrants face strong competition from companies already entrenched in the market and may have inexperienced management teams

   d. Number of jurisdictions – Company A operates in fewer jurisdictions so it would benefit less from diversification. Number of jurisdictions is not explicitly listed in the syllabus material but would deserve points if candidates can identify

Actual candidate answer for full marks:
a.
Insolvency Risk: when a company can no longer meet all it's financial obligations

Liquidity Risk: when a company assets pose a liquidity threat and may not be able to be sold if needed to cover it's obligations

b.
Company A is the higher wind-up risk:
- It is smaller (in terms of written premium)
- It is growing faster (typically seen in troubled firms)
- It Is younger (less established and experienced)
- It is less diversified (fewer jurisdictions, thus higher risk of a significant)

Examiner's report:

This is a fundamental question. There were several possible answers accepted. For part B. answers are easily deduced from the comparative table provided.

Question 13
Answer key:

a) b)
- Once a commodity is selected, all production of that commodity must be insured. This helps keep premiums down by avoiding insurance of only the most risky production.
- For crops, producers select their desired level of coverage ranging from 50 to 90% of their normal or expected yield. This deductible ensures that producers are always responsible for the first loss.
- Producers must buy insurance either before a commodity is planted or before any damage is possible.

c) Three of the following
- Minimizing countervail risk
- Focusing on the management of risks related to the stability of the entire farm entity,
- Encouraging the use of risk management practices and contributing to the use and development of private sector risk management tools (separate point from #2)
- Being relatively simple to administer and transparent for participants
- Minimizing the capitalization of program benefits into farm asset values

Actual candidate answer for full marks:

a.
1. Insurance must be purchased before planting or before damage possible
2. Once elected, all production of a commodity must be insurance
3. Usually a deductible and coinsurance apply which means that insured is responsible for the first loss and a portion of insured losses

b.
1. Avoid insurance being purchased because it is already needed
2. Avoid insurance only on part of the farm that is known to be problematic
3. Encourage loss control by ensuring that insured is responsible for the first losses and portion of insured losses

c.
1. Minimize distortion of the producer`s production and marketing decisions
2. Encourage risk management practices and promote development of risk management tools
3. Simplify administration process and promote transparency

Examiner's report:
Part A and B are quite intuitive and most candidates could provide several examples of provisions to control moral hazard. Part C is less intuitive and involves memorizing a list of principles. Most candidates did not do well on Part C.

Question 14

Answer key:

a)

- Increase confidence & satisfaction of consumers
- Policyholders expect to be insured for floods (Reputation risk)
- Flood insurance coverage would avoid having to differentiate between an actual event and sewer backup (clean and odour-free water vs. dirty and foul)
- Canadian insurance market is mature so could be an area of growth/profit for insurance companies
- Government programs serve to reinforce vulnerabilities and provide little incentive for those receive it to reduce risky behavior
- Price is risk-based
- Encourage risk mitigation
- Bundled coverage to reduce adverse selection

b)

- Bundled approach: In an effort to reduce adverse-selection
- Risk based pricing: Prices should reflect actuarial rates and higher risk areas should have to include risk based deductible
- Involvement of individuals insured's in their own flood management: carrying a portion of flood damages through deductibles and premiums and by becoming involved in risk mitigation on their own properties
- Government involvement in the program: Measures carried out by Canadian governments, and include land use planning to reduce flood risk, investment in structural flood controls and production of flood maps which identify flood return periods that are relevant for the industry
- Option of excluding highest risk individuals: Reduces adverse selection or keeps prices lower by not having to cover claims areas certain to eventually get flooded
- Partnership between insurance industry, governments and private individuals: Specific responsibilities of each entity should be defined through an agreement

c)

- Those who purchase insurance may feel that this action precludes further action to reduce flood risk, as there is an expectation of receiving financial assistance. So insured may choose to not to take action to mitigate flood risk on their own property, or perhaps purposely take action during flood events to increase damages with the expectation of receiving higher insurance payments.
- Provision of insurance for exposed members of the public may reduce government's incentives to reductive flood risk through adequate investment in structural and non-structural flood management measures.

Actual candidate answer for full marks:

a)

- Would improve customer satisfaction with insurers, since many believe flood is covered and are upset when they find out is isn't
- Provides a way for insurance market to grow in the mature Canadian market
- Flood insurance will provide deterrent to building in high risk areas through higher premiums and deductible and encourage risk mitigation through lowered rates & deductibles

- Eliminate the issue of determining what exactly caused water damage (sewer back-up vs. flooding) to determine if coverage exists

b)

- Rates – Should be based on risk level and actuarially sound (may allow minimal subsidization to maintain affordability)
- Deductibles – Should be higher for high risk individuals to encourage risk mitigation and make insurer more willing to accept risk
- Bundled – Should be bundled and not optional to increase market penetration and reduce adverse selection which could threaten economic viability of program
- Exclusions – Should excluded highest risk individuals to avoid affordability issues

c)

i. Since flood damage is covered, may do less to mitigate damages and may even move unwanted items to basement to get damaged and receive more compensation.
ii. With citizens having flood insurance, may see less incentive to prevent building in risk areas

Examiner's report:
Given the focus on flood coverage in the Canadian market in recent years candidates were well prepared and often had good answer for why it would be beneficial and ideas on how to design a plan. For part c) many candidates who lost points seemed to have trouble understanding the meaning of moral hazard.

Question 15
Answer key:

a)

- Insured property and casualty losses must exceed $100 Million
- Event must be dangerous to human life, property or infrastructure
- Damage must occur inside the United States, or if outside the United States at the premises of a United States mission or to certain US flagged vessels and air carries
- Event must be committed by an individual or individuals as part of an effort coerce the civilian population of the United States or influence the policy or conduct of the United States government (Note do not give points if candidate states foreign individual without also stating that domestic is included)

b)

- Capital market financing (Catastrophe bonds)
- Risk pools
- Reinsurance

c)

- Insurers do not pay premiums prior to incurring losses
- Government may recoup some of the losses that it pays, but otherwise, insurers are simply reimbursed for a portion of their costs
- Offered to any insurer universally rather than through a risk selective process

Actual candidate answer for full marks:

a)

- Damages from the event must exceed $100 million
- Must present a danger to human life, property or infrastructure

---

- Must occur in the USA, or if outside of the USA at a US mission or on a US flagged vessel or air carrier
- Performed via an effort to coerce the US civilian population or influence the conduct and policies of the US government (can be either domestic or foreign)

b)

- Through catastrophe bond market
- Use of private reinsurance market

c)

- Insurers do not pay premiums until a loss occurs
- Coverage is provided to everybody and is heavily subsidized by general tax revenue

Examiner's report:
Given that this question covered a US program some candidates did not seem to have fully detailed knowledge of how to answer. Also many people who lost marks did not answer with current criteria, but instead the rules when originally implemented.

Question 16
Answer key:
a)

1. Disability benefits that are at least equal to the EI sickness benefits
2. Payment of benefits starting on or before the 15th day of disability
3. In the case of weekly indemnity plans, payment of benefits for at least 15 weeks for each disability occurrence
4. Payment of benefits with no reduction for EI benefits received during the same period
5. In the case of weekly indemnity plans, reinstatement of full disability coverage after a disability within one month of return to work for future disabilities and within three months of return to work for recurrence of initial disability cause.

b)
1. A written mutual agreement on how the savings will be returned to the employees
2. A cash rebate equal to 5/12 of the savings divided amongst the employees, which is treated as employment income subject to source deductions
3. Providing new or increased benefits, including upgrading existing benefits, or providing more holidays or time off work

c)

1. Claimant who refuses or fails to apply for suitable employment without good cause
2. Claimant who leave jobs voluntarily without just cause
3. Claimant who lose jobs due to misconduct
4. Claimant who fails to take a training course designated by the CEIC, without good cause
5. Claimant who are out of work because of a strike or lockout

Actual candidate answer for full marks:
a)

- Must not be reduced for EI payments
- Disability benefit must be at least as high as EI benefits

- Benefits must be paid out within 2 weeks
- Premium reduction to be returned directly or indirectly to employees

b)

- Additional Benefits
- Direct $ refund
- No candidate got full marks on this subpart

c)

- Employee is fired for misconduct
- Employee quit voluntarily
- Employee on strike as part of a union

Examiner's report:
Most of the candidates poorly answered the question as it is not an important part of the syllabus. We graded this question quite generously for parts a and b accepting all answers close to the model solution. For part c) it was generally quite well answered as it had already been asked in the past and is also considered general knowledge even to those who have not read the paper.

Question 17
Answer key:
Max policy acquisition expenses deferrable = Net UEP + Premium Deficiency + unearned commission – net policy liabilities in connection with UEP
= 155,000 + 0 + 1,000 – 134,000 = 22,000 breakdown properly

The company has recorded 22,500 but the maximum is 22,000 so the amount of acquisition expenses deferred much be reduced by $500. However since there is enough unearned premium to cover the expected policy liabilities there is no need for a premium deficiency.

X: 0
Y: 22,000
Z: 22,000

Actual candidate answer for full marks:
EQUP = 155 000 – 134 000 + 1 000 = 22 000
Like DPAE is greater than EQUP, it should be reduced to the level of EQUP

Y=22 000 Z = 22 000 like DPAE = EQUP
X=0 because EQUP is positive

Examiner's report:
Candidates performed well on this question in general. Some candidates did not input the unearned commission into the Max policy acquisition expense deferrable formula. A few candidates had calculation errors while the underlying formula was correct.

Question 18
Answer key:
a.

	Formula	2013	2014	Total
Estimated Payments in period (a)		350,000	150,000	500,000
Payment Duration (b)		0.5	1.5	
Discount Rate (c)		1%	1%	
Present Value Claims Cash Flow (d)	(a)*(1+(c))exp(-(b))	348,263	147,778	496,041
Undiscounted Future Payments (e)		500,000	150,000	
Required Margin (f)		10%	10%	
Regulatory Capital at 180% (g)	(e)*(f)*1.8	90,000	27,000	
Risk Cost of Capital (h)		5%	5%	
Cost of Capital in Period (i)	(g)*(h)	4,500	1,350	
Duration (j)		1	2	
Risk (k)	(i)*(1+(c))exp(-(j))	4,455	1,323	5,779
Commuted Value	(d) + (k)			501,820

b.
Advantages:
Removes concern over credit worthiness of the reinsurer
Accelerated settlement, ending relationship with the reinsurer
Savings in administrative costs of monitoring/reporting claims
Improvement in perceived wealth as cash is valued higher than receivables
Certain immediate amount is substituted for an uncertain future amount
Tax benefit through creation of a marginal underwriting loss

Disadvantages:
Have to hold capital for additional risk (support the liabilities)
Cash outlay, forgo other investment opportunities
Risk of future adverse loss experience

Actual candidate answer for full marks:
a.

	Total	2013	2014
Estimated payment	500,000	350,000	150,000
PV at i=1%	496,041	350K/1.01^.5 = 348,263	150K/1.01^1.5 = 147,778
Capital required		500,000x10%x180% = 90,000	150,000x10%x180% = 27,000
Cost of capital		90,000x5%=4,500	27,000x5%=1,350

| PV Cost of capital | 5,778 | 4,500/1.01^1=4,455 | 1,350/1.01^2=1,323 |

Estimated commuted value of claims = 496,041 + 5,778 = 501,819

Alternative to the Solution Key:
AP = Ambivalence point
Assume tax rate is 35%
AP = [AP – 0.95min(Reported Reser ves, APV)] Tax rate + PV(loss)
PV = 350K/(1.01^0.5) + 150K/(1.01^1.5) = 496,041
APV = PV (1+MfAD$_{Claims}$) = 496,041 x (1.1) = 545,645
AP = [AP – 0.95min(500K, 545,645)]x0.35 + 496,041
AP = 0.35AP – 166,250 + 496,041
AP = 507,371

b.

Sample 1:
Advantage:
   • The primary insurer exchanges an uncertain future amount by a certain amount immediately.
Disadvantage:
   • The primary insurer may be subject to adverse development (court award, social inflation, …)

Sample 2:
Advantage:
   • The primary gets a cash flow immediately for assuming the liabilities
Disadvantage:
   • The company must now hold capital in order to support the liabilities.

Sample 3 (assumes primary insurer is buyer of commutation agreement):
Advantage:
   • Not subject to adverse development of loss any more
Disadvantage:
   • Cash outlay, forgone some other investment opportunities

Examiner's report:
a.   Many candidates attempted to use the Steeneck Ambivalence Point calculation, but not all inputs
     were given. These candidates were awarded partial marks.
     Other common mistakes involved using 350,000 instead of 500,000 as undiscounted future payment
     in calculation of required capital, mis-applying the 180% regulatory capital, the 5% risk cost of
     capital, and the durations of 1 and 2 for the PV of risk.

b.   Because the table in the question incorrectly stated that the payment was to the reinsurer, and not
     from the reinsurer, many candidates reversed the advantages/disadvantages listed above. These
     candidates were given full marks.

Question 19
Answer key:

a.
(identify any 2 of the below, and explain each)

Reinvestment Risk: Risk that the cash flows re-invested after the 3-5 year bond maturities will yield less than 6% before needed to pay out claims in years 6-10.

Liquidation of Assets (Price Risk): Risk that the required early sale of bonds in years 1-2 to cover liability cash flows would be at a loss, resulting in less than a 6% overall yield.

Investment Expenses: Portfolio yield should be reduced by expected investment expenses to reflect the net investment income expected to be earned by the insurer.

Credit Risk: Any losses expected from default should be considered in the discount rate used, and may cause it to differ from the unmodified portfolio yield.

Future Assets: Yield on assets expected to be acquired after the balance sheet date may differ from the yield on assets currently in the portfolio, which should be considered in the discount rate assumption.

Assets specifically backing liability line of business: Because the liability line of business is more long-tailed than the property line, the longer-term assets of the portflio should be considered to be backing the liabilities. The yield on those assets would differ from the overall portfolio yield of 6%.

b.

Gross Claims Liab = Gross PV + PfAD for Claims Development + PfAD for Investment Return Rate
Net Claims Liab = Net PV + PfAD for Claims Development + PfAD for Investment Return Rate + PfAD for Recovery from Reinsurance Ceded

But we do not currently know the claims development MfAD. We do have the net claims liability.
PfAD for Investment Return Rate (net) = 4,571.88 − 4,518.35 = 53.53

$5,023.72 = 4,518.35 + 53.53 + 2 * MfAD Reinsurance * 4,518.35 + MfAD Reinsurance * $3,012.23

MfAD Reinsurance = 3.75%

MfAD Claims = 2 * 3.75% = 7.5%

Gross Unpaid = 10,000 − 2,000 = 8,000

Paid in 12-24 months: (50% - 20%) / 80% = 37.5%
Paid in 24-48 months: (90% - 50%) / 80% = 50%
Paid in 36-48 months: (100% - 90%) / 80% = 12.5%

PV Gross disc @ 5% = 8,000 * 37.5% / (1.05)^0.5 + 8,000 * 50% / (1.05)^1.5 + 8000 * 12.5% / (1.05)^2.5 = 7,530.58
PV Gross disc @ 4% = 8,000 * 37.5% / (1.04)^0.5 + 8,000 * 50% / (1.04)^1.5 + 8000 * 12.5% / (1.04)^2.5 = 7,619.81

PfAD for Investment Return Rate (gross) = 7,619.81 – 7,530.58 = 89.23

Gross Claims Liab = 7,530.58 + 89.23 + 7.5% * 7,530.58 = 8,184.60

Actual candidate answer for full marks:
a.
Sample 1:
1. Mismatch in duration of assets and liabilities: the assets have a shorter durations. Therefore, actuary must consider reinvestment risk and select a slightly more conservative discount rate.
2. Credit risk: if assets present a certain risk of default, a conservative selection would be appropriate.

Sample 2:
1. Reinvestment rates – if assets and liability cash flows don't align and there is excess cash expected, consider future reinvestment rates that could be earned in this cash.
2. If there will be a need to liquidate assets because liability cash flows will be greater that assets cash flows generated by the portfolio. There could be gains/losses on the liquidation.

b.

5023.72 = 4571.88 + 2(x)(4518.35) + x(3012.23)
451.84 = 12048.93x
X=0.0375

Gross discounted liabilities incl margin
=2(0.0375)[3000/(1.05^0.5) + 4000/(1.05^1.5) + 1000/(1.05^2.5)] + 3000/(1.04^0.5) + 4000/(1.04^1.5) + 1000/(1.04^2.5)]
=2(0.0375)(7530.59) + 7619.81
=564.79 + 7619.81
=8184.6

Examiner's report:
a. Many considerations given by candidates were considerations for the interest MfAD instead of considerations for the discount rate. Another common error was to consider using a different discount rate for ceded, net or gross layers, when the question states that the assets are backing all claims liabilities.
b. Generally, candidates did well on this part. Some errors included accidentally calculating the reinsurance recovery MfAD as twice the claims development MfAD, or calculating the claims PfAD as twice the reinsurance recovery PfAD.

Question 20
Answer key:
a.

Premium – Voluntary (a)	50,000
Premium – FA (b)	2,000
Discounted Internal Losses (c)	41,015
Discounted FA Losses (d)	1,940
LAE (e)	5,742
Cont Comm (f)	1,500
Maint Exp (g)	2,450
EQUP (h)	-647
Write-Down (i)	7,500
Premium Deficiency Liability (j)	647

(a) Total voluntary premiums = 30,000 + 20,000 = 50,000
(c) Discounted internal losses = 30,000 * 0.95 * 0.95 + 20,000 * 0.85 * 0.82 = 41,015
(d) Discounted FA losses = 2,000 * 0.97 * 1 = 1,940
(e) LAE = (c) * 14% = 5,742.10
(f) Contingent Commissions = (a) * 3% = 1,500
(g) Maintenance Expenses = (a) * 5% * 0.98 = 2,450
(h) EQUP = (a) + (b) - (c) – (d) – (e) – (f) – (g) = -647.10
(i) Write-Down: Since EQUP < DPAE of 7,500 then we write down the DPAE to the level of EQUP to a minimum of 0 DPAE. Thus, the write down is the full 7,500 DPAE. Not necessary to say for this question's marks.
(j) A liability for the Premium Deficiency is set up for any remaining lack of EQUP after writing down the DPAE to 0. In this case, that is an additional $647. Alternatively, because the Cantin & Trahin paper has a paragraph that incorrectly states that "…if the absolute value of the negative EQUP exceeds the deferrable expenses, a premium deficiency must be booked as a liability for the remaining deficiency", marks were also awarded to students who answered that there was no premium deficiency.

b.

Depending on how the loss adjusting expenses, contingent commissions, and maintenance expenses are split between the lines of businesses, it is possible that the Personal lines will not incur any premium deficiency or write-down of the DPAE. If this is correct, then the EQUP from this line of business is currently offsetting some of the premium deficiency in the Auto and FA lines of business (which appear to be the lines of business largely contributing to the deficiency). By splitting the lines of business separately for premium deficiency analysis, the larger deficiency on these two lines of business are evaluated separately and summed without any offset from Personal. The overall premium deficiency could be larger.

Actual candidate answer for full marks:
a.
Net UEP = 30000+20000+2000 = 52000
Net Pol Liability
        Auto = 30000 x .95 x .95 = 27075
        P&L = 20000 x .85 x .82 = 13940
        FA = 2000 x .97 x 1 = 1940
Total = 42955
IAE = 14% (27075 + 13940) = 5742.1

Maint exp = (30000+20000)x.98x5% = 2450
Cont Com = (30000+20000)x3% = 1500
EQUP = 52000 – 42955 – 5742.1 – 2450 – 1500 = -647.1
Prem deficiency = 647.1

b.
Sample 1
If we look at this line by line, the auto has higher loss ratios. Those lines could have negative EQUP which are being offset by positive EQUP in the personal property line.
Sample 2
In part (a) by aggregating all lines we remove the effect of profitable lines on the total.
$EQUP_{auto}$ = 30,000x(1 - .95x.95 - .05 - .03 - .95x.95x.14x.98) = -3,190
$EQUP_{Prop}$ = 20,000x(1-.85x.82 – .05 - .03 - .85x.82x.14x.98) = 2.547
Just using those 2 lines we can assume that the DPAE from Auto would offset $EQUP_{Auto}$, bringing it back to zero. Then when adding it to $EQUP_{Prop}$ we already have a large positive number (effect of FA would be negligible) instead of negative.

Examiner's report:
a. Candidates scored well on this part. Because the Cantin & Trahin paper has a paragraph that incorrectly states that "…if the absolute value of the negative EQUP exceeds the deferrable expenses, a premium deficiency must be booked as a liability for the remaining deficiency", marks were also awarded to students who answered that there was no premium deficiency. Also, the paper incorrectly says that discounting is not allowed if there is a premium deficiency, so marks were not removed for candidates who followed this reasoning. Some common errors were discounting the contingent commissions, including FA in the calculations of ULAE/commissions, or using the discount factors as discounted loss ratios.
b. Most candidates only received part marks for this section, not putting enough detail for a 0.75 mark question. Some failed to specifically refer to this company and its lines of business to receive marks.

Question 21
Answer key:
a.
Investment Income in 2012 for AY 2010:
(27,000+35,000)/2*4.00% = 1,240
Investment Income in 2011 for AY 2010:
(59,000 + 35,000) / 2 * 4.5% = 2,115
Excess in 2012 for AY 2010:
(35,000+1,240) – (27,000+18,000) = -8,760
Excess in 2011 for AY 2010:
(59,000 + 2,115) – (35,000 + 21,000) = 5,115
Cumulative Excess(Deficiency) Ratio:
        -(5,115 – 8,760) / 59,000 = -6.2%

b.
Discount the amounts in subsequent terms to time 0. It was enough for full marks to say to discount the claims liabilities back to time t-1 instead of incorporating investment income.
Alternatively, calculate the present value of the cash flows from the calendar year.

Actual candidate answer for full marks:

a

Inv Income 2011 = 0.045(59000+35000)/2 = 2115

Inv Income 2012 = 0.04(27000+35000)/2 = 1240

Cumulative xs = Beg reserves – Paid + Inv income – End reserves

$\qquad$ = 59000-(21000+18000)+(2115+1240)-27000

$\qquad$ = -3645

XS/Deficiency Ratio = -3645/59000 = -0.062

b

Use the present value @t=0 (ie end of 2010) of the discounted liabilities and the paid losses.

Examiner's report:

a. Candidates scored well. Some errors included adding investment income from CY 2010, or forgetting to calculate the ratio itself once the excess/deficiency amount had been calculated.

b. Candidates did not score well at all. Although many answers spoke about discounting, they did not include enough detail to indicate that the candidate meant that the discounting should be applied to the paid/outstanding at time t to bring it back to time t-1.

Question 22

Answer key:

a.

According to Canadian Income Tax Regulations, the income tax deduction in respect of an insurer's claim liabilities is equal to 95% of the lesser of the reported reserve and claim liability. The prepayment of tax as a result of the liability deducted for tax purpose being less than the amount reported on the balance sheet give rise to an asset for future income taxes.

b.

An omission, understatement or overstatement is material if it would cause the user to reach a different conclusion or follow a different course of action.

c.

Discounted Estimate of Claim Liability Including PfAD

= 103,345 +500 +7,300 +4,000= 115,145< reported reserve = 120,000   (

Present Value Factor

= (103,345 +500)/ 111,453= 0.9317

Estimated Effect of Discounting the Asset for Future Income Taxes

= (120,000 – 0.95*115,145) * 35% * (1 – 0.9317) = 254

Actual candidate answer for full marks:

a) The future tax temporary difference arises from the fact that the deduction for tax purposes is less than the carried amount. Only 95% of either the reported reserve or liability is deducted, leaving a marginal tax difference.

b) An omission, understatement or overstatement is material if it changes the user's reasonable expectations or the user's decision.

c) = (Reported Reserve – 0.95*min(Reported reserve, APV Claims liability)) * Tax Rate * (1 – PV Factor)

APV Claims liability = Discounted estimate + Pfads = 103,345 + 500 + 7,300 + 4,000 = 115,145

PV Factor = (Discounted estimate + Pfad Discount rate) / Undiscouted estimate = (103,345 + 500)/111,453 = 0.932

Deferred tax asset = (120,000 – 0.95*115,145)*0.35*(1 – 0.932) = 253

Examiner's report:
Candidates performed well on this question and a large proportion of them received full credit. A common mistake was forgetting to include the PfAD for Investment Return Rate in the calculation of the PV factor.

Question 23
Answer key:
a. list of elements:
- subjective analysis of the company's market position
- prospects
- parental support
- sources of capital
- quality and sustainability of reinsurance support
- management quality
- sustainability of earnings

b. Adjusted Investment Yield = 2* (Net Investment Income + OCI)/(Beginning of Year Assets + End of Year Invested Assets – Net Investment Income - OCI)
= 2 * (20,000 + 0)/(182,000+198,000-20,000-0)=11.11%

c.
- Line of Business
- Geographic

Actual candidate answer for full marks:
a)
Parental support
Subjective analysis of the competitive position
Access to reasonable capital

b) Y = (Net II + OCI) * 2 /(Inv Ass + Inv Ass – (Net II + OCI)) = 11.11%

c)
> Line of business diversification
> Geographic diversification

Examiner's report:
For part a), candidates struggled to get full credit on this question. Many candidates tried to guess the answer or answered by listing some of the MSA ratios.

For part b), the majority of the candidates managed to get full credit. Many candidates failed to include the Other Comprehensive Income in the formula, which resulted in a small point deduction.

For part c), candidates performed generally well on this question.

Question 24
Answer key:
a. Two of the following:
  1) Unrated insurers: in other industries, most firms with no debt have no rating. But almost all insurers are rated, except for new firms. It is less expensive to pay for a rating than to demonstrate financial strength individually to others.

  2) Reliance by consumers and third parties: Independent agents use ratings to select insurers, and insurers use ratings to select reinsurers. Agents might be sued for providing insurance from a financially weak insurer. Reinsurance officers at primary insurers must evaluate the ability of reinsurers to pay obligations years in the future. They rely on commercial ratings, and an unrated reinsurer might not even be considered.

  3) Efficiency: Evaluating financial solidity requires expertise and extensive data. Most agents, underwriters, and even some regulators do not have the time, experience, or resources of the rating agencies to thoroughly research the financial condition of all insurers.

b.
> A. M. Best uses the expected policyholder deficit method/ EPD method. Risk-based was given full mark for this question.
> Moody's and Fitch use stochastic cash flows to model economic capital.
> S&P focuses on principles-based models/internal capital models and ERM practices.

c.
> *Expected policyholder deficit method:*
> A.M. Best retains the RBC structure of independent risk categories with a covariance adjustment. Best uses a 1% EPD ratio for all sources of risk. In financial terms, the charge for each risk is the amount of capital such that the cost of a put option offsetting the risk is 1% of policyholder reserves. In conventional insurance terms, the EPD is the pure premium for unlimited aggregate excess-of-loss reinsurance. The EPD ratio is the EPD divided by the market value of held reserves.

Stochastic cash flow capital models:
Moody's and Fitch use stochastic cash flow models to examine the accumulated cash flows of assets vs insurance liabilities. Asset returns are based on interest rate generators and random walk simulations of equity returns. The interest rates and simulations are arbitrage free. The rating agency stochastic models use either value at risk or tail value at risk measures. A 99% VaR is the capital needed to remain solvent at the 99th percentile of the aggregate loss distribution. A 99% TVaR is the average capital needed to remain solvent in the 1% worst scenarios.

Principles-based models/internal capital models:
S&P focused on evaluating insurers' enterprise risk management systems and internal capital models. It bases capital requirements on a weighted average of its own formula and the client's economic capital model. S&P reasons that well-managed insurers evaluate their capital needs more accurately than a rating agency can. Insurers examine distributions of reserve development using extensive data bases and sophisticated reserving methods. They can assess value at risk, tail value at risk, and expected policyholder deficit better than a rating agency can using public data.

(full points for describing any one of the models above)

Actual candidate answer for full marks:
a)
- agents are wary about P&C insurers that are not rated because they could hide financial difficulties
- getting a rating is efficient because the cost of a rating is much less than making the proof of financial situation to each party individually

b)
i) a ratio approach based on the risk based capital approach of regulators
ii) stochastic approach based on TVAR
iii) a qualitative approach using the insurer own internal capital model

c)
AM best is a ratio of adjusted available to net capital required where net capital is
Square root $(b1^2 + b2^2 + b3^2 + (0.5b4)^2 + (0.5b4+b5)^2 + b6^2) + b7$
- B1 : Fixed income
- B2 : Equity
- B3 : Interest rate risk
- B4 : Credit risk
- B5 : Loss and lae
- B6: Net premium written
- B7 : Business risk

Square root is used to reduce covariance among risk as it is unlikely they will happen simultaneously

Examiner's report:
For part a), the majority of candidates managed to get full credit. Some candidates gave very similar answers for the two elements.

For part b), a common mistake was that candidates mixed up the different models. Most of the candidates got partial credit on this question.

For part c), most of the candidates answered by describing the BCAR. A little less than half of the candidates managed to get full credit on this question.

Question 25
Answer key:
    (a) Investment income = 75 + 200 + 125 = 400
        Since CCC is classified as Held for Trading, the gain or loss needs to be recognized immediately. Thus, the investment income = 400 + (2,900 – 3,000) = 300

    (b) AAA – recorded as amortized value = 1,800
        BBB – recorded as market value = 7,500
        CCC – recorded as market value = 2,900

    (c) AOCI = 7,500 – 7,000 = 500

    (d) For Held for Maturity,   the discounted incurred loss would remain the same as it is discounted using the book yield, which is not impacted by the market interest rate. The investment income would remain the same as the unrealized gain/loss is not recognized. Thus, no impact due on Net Income.

        For Available for Sale, the discounted incurred loss would increase due to the decrease in discount rate. The investment income would stay the same as the unrealized gain/loss is not recognized. Thus, the Net Income would decrease.

        For Held for Trading, the discounted incurred loss would increase due to the decrease in discount rate. The investment income would increase as the market value of the bond will be higher. The impact of Net Income depends on which effect is higher.

Actual candidate answer for full marks:
a.
75 + 200 + 125 + (2900 – 3000) = 300

b.
AAA   1800
BBB   7500
CCC   2900

c.
AOCI = 7500 – 7000 = 500

d.
AAA: no impact. Asset is measured at amortized value and discount rate is based on book yield which doesn't change either

BBB: the change in MV of bond goes to AOCI instead of NI but the discount rate is smaller, resulting in higher PV of liability, thus, NI would decrease
CCC; the change in MV of the bond flows through NI (with smaller interest rate, MV of asset is larger, the discount rate is smaller now too, resulting in change MV of liability. Thus, the overall movement of NI is uncertain.

Examiner's report:
This is a standard question which has been asked several times in the past. The concepts are simple and standard. Most students get very high marks on this.

Question 26
Answer key:

BCAR: Adjusted Surplus / Net Required Capital
66,000 / 48,374 = 136%

Net Require Capital: (edited to add brackets to solution)

$$\sqrt{B_1^2 + B_2^2 + B_3^2 + (\tfrac{B_4}{2})^2 + (\tfrac{B_4}{2} + B_5)^2 + to\ B_6^2 + B_7}$$

$$= \sqrt{4{,}577^2 + 10{,}842^2 + 1{,}839^2 + (\tfrac{4{,}394}{2})^2 + (\tfrac{4{,}394}{2} + 41{,}000)^2 + 18{,}000^2 + 35}$$

$$= 48{,}374$$

Credit Risk (B4):

Required capital for receivable from agents = 1,800 * 5% = 90

Required capital for reinsurance recoverables =
(50,000+850) * 2% + (20,000+2000) * 6% + (5,000+530) * 20%
= 3,443

Indicated Reinsurance Dependence Required Capital =
3,443 * (1.25 − 1) = 861

Adjusted Reserve Amount =
(50,000+850) + (20,000+2000) + (5,000+530) = 78,380
Minimum Reinsurance Dependence Required Capital = 78,380 * 1% = 784
Total required capital for Credit Risk =
90 + 3,443 + max (861,784) =

4,394

Interpretation:
Given a BCAR score greater than 100%, the implied balance sheet strength is secure

Actual candidate answer for full marks:
BCAR = Adjusted Surplus / Net Required Capital

Net Required Capital = $\sqrt{B_1^2 + B_2^2 + B_3^2 + \frac{B_4^2}{2} + (\frac{B_4}{2} + B_5)^2 + B_6^2 + B_7}$

Capital Required for Credit Risk:

C.R. for receivable from agents = 0.05 x (1,800) = 90

C.R. for rein recoverables =

    Sum (Balance + Reserve Def) x (Capital Factor) x (Reinsurance dependence factor)
    = [(50,000 + 850) x 0.02 + (20,000 + 2,000) x 0.06 + (5,000 + 350) x 0.2] x [1.25]
    = 4,303.75

Total Capital required for credit risk = 90 + 403.75 = 4,393.75

Total Net Capital Required =

$\sqrt{4,577^2 + 10,842^2 + 1,839^2 + \frac{4,393.75^2}{2} + (\frac{4,393.75}{2} + 41,000)^2 + 18,000^2 + 35}$ = 48,374

BCAR = 66,000 / 48,374 = 136%

This is favourable as a BCAR > 100% is considered favourable

Examiner's report:
In general, candidates did very poorly on this question and many left the question completely blank. The examiners were expecting candidates, at a minimum, to understand the test and identify the components of the test.

Question 27
Answer key:
  a)
  1. Data Quality

      Proper coding of loss exposure is essential to ensure meaningful model output. All property attributes need to be obtained. Additional information can improve loss estimates.
      In addition to capturing the information, verifying data on a timely basis is also important. Safeguards should be implemented to prevent manipulation of data, and auditing of the underwriting information is critical.
      A.M. Best expects higher rated companies to be those that emphasize strong catastrophe management with a superior understanding of and emphasis on quality of underwriting data.

  2. Monitor Exposure

      A.M. Best believes that careful monitoring of zonal and other specific aggregates, including what-if scenario testing using severe events in areas with concentrated exposures, is critical to understanding maximum potential loss.
      A.M. Best also expects those companies that are considered strong risk manages to review aggregate loss-exposure accumulation.

  2.   Controls

      The final key to strong catastrophe risk management is the integration of the monitoring of exposure into the underwriting process.
      For companies with material catastrophe exposure, the management of that exposure should be a continual process, not just an annual run of models.

(Note: Consideration was also given for other explanations if they demonstrated understanding of the concept from the article).

b)
1. Calculate the after tax net per occurrence PML of the first event (including retention, co-insurance and reinstatement premiums); this amount is subtracted from surplus.
2. Reinsurance recoverable are increased by 40% of the difference between gross and net pretax loss and LAE of the first event
3. 40% of the net pretax loss and LAE of the first event is added to existing reserves to capture the potential for adverse development
4. The aftertax net PML for an additional event is deducted from risk-adjusted surplus
5. Where hurricanes are the major risk, the PML for the second event is the same as for the first, as the occurrence of a major hurricane has no influence on the potential severity of subsequent events.
   Where earthquakes are the major exposure, the second event is reduced to a 1 in 100 year loss.

Actual candidate answer for full marks

a.
data: correct coded for loss exposure & geocoded
monitor: use more than one cat models. monitor aggregate loss exposures.
control: limit aggregate exposure, use reinsurance program. Cat management integrated to UW process etc.

b.
test on both events for hurricane at 1-100 yr return PML.
EQ at   1-250 yr return for first event
          1-100 yr return on second event

first step: subtract the surplus of the Net after tax PML for first event (including retention, installed premium, etc).

2nd step: increase 40% reinsurance recoverable of (Gross PML – Net pre tax PML)

3rd step: increase adverse development of Net pre-tax PML

4th step: considered the 2nd even for Net after tax PML.

Examiner's report:
Candidates did fairly poorly on this question and many candidates left the question blank. Candidates that had read the paper and answered the questions generally did well on part a), as expected, and more poorly on part b) which was a more technical question.

Question 28
Answer key:

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a. Pillar 1 covers all the quantitative requirements. This pillar aims to ensure firms are adequately capitalized with risk-based capital. All valuations in this pillar are to be done in a prudent and market-consistent manner. Companies may use either the Standard Formula approach or an internal model approach. The use of internal models will be subject to stringent standards and prior supervisory approval to enable a firm to calculate its regulatory capital requirements using its own internal model.

Pillar 2 imposes higher standards of risk management and governance within a firm's organization. This pillar also gives supervisors greater powers to challenge their firms on risk management issues. It includes the Own Risk and Solvency Assessment (ORSA), which requires a firm to undertake its own forward-looking self-assessment of its risks, corresponding capital requirements, and adequacy of capital resources.

Pillar 3 aims for greater levels of transparency for supervisors and the public. There is a private annual report to supervisors, and a public solvency and financial condition report that increases the level of disclosure required by firms. Any current returns will be completely replaced by reports containing core information that firms will have to make to the regulator on a quarterly and annual basis. This ensures that a firm's overall financial position is better represented and includes more up-to-date information.

b.
- Framework Level 1: Pre-conditions for solvency assessment
- Framework Level 2: Regulatory requirements: financial, governance, market conduct
- Framework Level 3: Supervisory assessment and intervention
- Disclosure

c.
Compare with S2 Pillar 1: The financial block of Framework Level 2 is similar to S2 Pillar 1. Supervisors use a variety of quantitative measures within Level 2 to assess the soundness of a P&C insurer's current financial position. Principal among these measures has been a risk-based capital requirement (e.g. MCT and BAAT).
In the past, this risk-based capital requirement has been "added on" top of the liabilities determined in accordance with Canadian GAAP (Generally accepted accounting principles).
In the future, we envision that the solvency financial requirement will be determined on an integrated basis using a regulatory asset requirement approach.

Compare with S2 Pillar 2: The governance block of Framework Level 2 is similar to S2 Pillar 2. Sound governance, supported by effective disclosure, is of key importance for the adequate management of the insurer and critical to the effectiveness of the regulatory regime. Some risks may be addressed only through governance standards rather than by setting regulatory financial requirements. Hence governance standards form one of the key blocks in the solvency framework.
The solvency framework assumes a dynamic risk assessment by the insurer's management. This includes that judgments are made regarding provisioning and capital adequacy. It is, first of all, clearly the responsibility of the insurer itself to fulfill its fiduciary role to policyholders and to manage its risks, value its obligations and procure sufficient capital. It is the role of the regulator to see that this management responsibility is met and to ensure accountability.

Compare with S2 Pillar 3: The Disclosure section is similar to S2 Pillar 3.

There is a need to differentiate between public disclosure and disclosure to the regulator which is subject to confidentiality. Information provided to the regulator and subject to confidentiality will generally be more detailed and technical in nature. Ensuring appropriate confidentiality not only guards against disclosure of commercially sensitive information but also fosters openness between the regulator and the insurer. Insurers should provide sufficient information to give confidence to the regulator and the public at large that they are appropriately carrying out their responsibility to manage their risks and protect the interests of policyholders.

Public disclosure is critical for a well balanced solvency regime, to the operation of a sound market and to achieve the aims of transparency, comparability and convergence. The use of increasingly risk-based calculations of capital requirements is expected to increase the quality and utility of risk disclosures that should be provided by insurers.

For part C, many alternative answers are accepted as long as candidates make valid comparison between solvency 2 and OSFI framework.

Actual candidate answer for full marks:
No candidates received full marks for this question.

Examiner's report:
Candidates did well on part A as Solvency 2 has been on the syllabus and has been tested for a few times. Candidates really fell apart in Part B as many people started to cite the MCT standard, which is not what this question is asking about. In part C, many alternative answers were accepted. However, this performance was poor as many candidates were not able to get both part A and B correct, hence the comparison was incorrect.

Question 29
Answer key:
Part a)
The base scenario is a realistic set of assumptions used to forecast the insurer's financial position over the forecast period.
Normally, the base scenario is consistent with the insurer's business plan.

Part b)
The prerequisite for a satisfactory opinion is that the insurer will be able to meet its future obligations under all plausible adverse scenarios, and under the base scenario it meets the minimum regulatory (supervisory target was also accepted) capital requirement. Since surplus is greater than 0 in all scenarios, the insurer is in satisfactory financial condition.

Part c)
Any 2 of the following:
-an increase in loss ratio due to a soft market, inadequate pricing or lost business that is relatively more profitable than the retained business;
-an increase in the fixed expense ratio;
-an increase for certain types of expenses (for example: more advertising costs to counter a very aggressive competitor);

-a shift in portfolio mix since the lost business could have a much different average premium or could be primarily from a specific market segment;
-an increase in reinsurance costs as a percentage of subject premium; and
-forced sale or liquidation of assets.

Part d)
Any 2 of the following:
-settling claims faster by minimizing litigation or fast tracking claims handling;
-reviewing reserving and claim settlement guidelines;
-implementing rate increases, where possible; and
-reviewing the target mix by line of business or jurisdiction.

Actual candidate answer for full marks:
a) The base scenario is the expected scenario over the projection period, as a result, it should be similar to the business plan.
b) The company is in satisfactory financial condition because under all scenarios, surplus is positive (assets > liabilities). Also, under the base scenario, the MCT exceeds the supervisory target of 150%.
c)
  a. Change in mix of business.
  b. Increase in fixed expense ratio.
d)
  a. Increase rates where possible.
  b. Review claims settling practices.

Examiner's report:
For part a) and b), candidates performed well and a large proportion of them got full credit.

For part c) and d), many candidates failed to get full credit either by trying to guess the answer or by giving answers related to other DCAT scenarios. Most candidates managed to get at least 1 out of 2 answers correct.

Question 30
Answer key:
Part a)
-Minimum Capital Ratio: The minimum level of capital necessary for an insurer to cover the risks specified in the capital tests.

-Supervisory Target Capital Ratio: The level of capital necessary for an insurer to cover the risks specified in the capital tests as well as to provide a margin for other types of risks not included in the tests.

-Internal Target Capital Ratio: The level of capital, based on the company's own risk and capital adequacy assessment process, necessary to cover the risks specified in the capital tests as well as all other risks of the insurer.

Part b)

-Internal Target Capital Ratio: 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, it is <u>required to inform OSFI immediately</u> and <u>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</u>. Increased supervisory attention may be warranted based on OSFI's assessment of the timeliness and appropriateness of remedial actions.

Actual candidate answer for full marks:
a)
      i.   Minimum capital required for an insurer to cover the risks specified in the capital test.

      ii.   Level of capital necessary for insurer to cover the risks specified in the capital tests and provide a margin for other types of risks not included in the capital tests.

     iii.   Level of capital necessary to cover all risks of the insurer based on insurer's own risk profile and risk appetite. Should be set above supervisory target.

b) Must inform OSFI immediately and provide reasons for capital depletion, correction actions and expected results including specific timelines when capital is expected to return to the internal target.

Examiner's report:
Overall, candidates performed well on this question and managed to get full credit.

Question 31
Answer key:
a) Any 2 of the following:
      i.   Risk identification and control
      ii.   Providing a complementary risk perspective to other risk management tools
     iii.   Supporting capital management
     iv.   Improving liquidity management

b)

    Scenario testing:

    Scenario testing uses a hypothetical future state of the world to define changes in risk factors affecting an institution's operations. This will normally **involve changes in a number of risk factors**: as well as **ripple effects** that are other impacts that follow logically from these changes and related management and regulatory actions. Scenario testing is typically conducted over the **time horizon appropriate** for the business and risks being tested. Scenario testing is typically more complex.

    Sensitivity testing:

Sensitivity testing typically involves an **incremental change in a risk factor** (or a limited number of risk factors). It is typically conducted over a **shorter time horizon**, for example an instantaneous shock. Sensitivity testing requires **fewer resources** than scenario testing and can be used as a simpler technique for assessing the impact of a change in risks when a quick response or when more frequent results are needed. Sensitivity testing is typically more simple.

Actual candidate answer for full marks:
a)
    a. Risk identification and control.
    b. Support capital management.
b)
    a. Scenario testing: Presents a hypothetical state of the insurer by changing certain risk factors and then determining if such change is reasonable. It includes ripple effects and is more complex. The objective is to alter the financial condition of the company
    b. Sensitivity testing: It relates to a change in one single factor and sees the impact on interrelated risks. Fewer resources, simpler. The shock is almost immediate or instantaneous.

Examiner's report:
For part a), most of the candidates managed to get full credit.

For part b), most candidates were able to define sensitivity and scenario testing. Only a few candidates managed to get full credit by comparing and contrasting the two elements.

Question 32
Answer key:
Part A

- Surplus – Buying the cat reinsurance decreases surplus if no cat event occurs, due to the cost of reinsurance.
- Loss reserves – Net reserves are not impacted if no cat event occurs.
- Investment income is reduced

Part B
- Surplus - the risk of significant drop is substantially mitigated when a large cat occurs and the treaty is in place
- Net reserves are at lower level since the cat losses are covered by reinsurance
- Investment income is reduced

Alternative answer

Part B, for reserves, also accept if candidate mentioned that there is no change to loss reserve and that the cat losses are covered by reinsurer (assume 10% is disappear)

Part B, for investment income, also accept if candidate mentioned that investment income will also be protected. Without the treaty, the company might be forced to sale or liquidate some investment to cover loss. With treaty, we can afford to not sell or sell only a little of the investment assets to cover our limited loss.

Part B, for investment income, also accept if candidate mentioned that investment income depends on timing of event but will be ultimately higher

Actual candidate answer for full marks:
Part A
- i. Surplus decrease due to cost of treaty
- ii. No change
- iii. Investment income decreases due to cost of treaty (less money to invest)

Part B
- i. Surplus will be higher if treaty is purchased since there is less impact from the catastrophe
- ii. Net loss reserve will be lower if treaty is purchased since part of the cat loss is ceded to reinsurer
- iii. Investment income is lower due to cost of treaty (less money to invest)

Examiner's report:
This question covers basic reinsurance accounting concepts. It is also a simpler version of an example listed in the actual reading. Students, in general, scored high in this question.

Question 33
Answer key:
1. set up sound and comprehensive earthquake exposure risk management policy that is subject to oversight by the Board of Directors and is implemented by senior manager
2. earthquake exposure data needs to be appropriately captured and regularly tested for consistency, accuracy, and completeness
3. Earthquake models should be used with a sound knowledge of their underlying assumptions and methodologies, as well as with a high degree of caution that reflects the significant uncertainty in such estimates
4. PML estimates should properly reflect the total expected ultimate cost to the insurer, including considerations for data quality, non-modelled exposures, model uncertainty, and exposures to multiple regions
5. it needs to ensure that they have an adequate level of financial resources and appropriate contingency plans to successfully manage through a major earthquake.

Many alternative answers are accepted as long as the candidate demonstrated that they understand there are five areas to be covered and that an explanation for each area is given. For example, for the data element, we also accepted a candidate saying that data needs to be geocoded and system would need to be able to cope with this data.

Actual candidate answer for full marks:

Earthquake risk management policy. The insurer should identify its risk appetite and tolerance with respect to earthquake risk. It should describe and define those policies. Senior management will be responsible for overseeing the risk management policy

Data quality. Insurer should store data at the time of underwriting, invest in technology to improve data quality, remediate data sources that are inadequate and implement safe guards to prevent miscoding.

Earthquake model. It should understand modeling alternatives and how the selected model suits the portfolio, understand the limitations of the model used, ensure qualified staff run the model and that is continually updated.

Identify PML. Should estimate, and identify PML appropriately accounting for data quality, model uncertainty, and non-modelled losses

Capital available and contingency plans. Capital should be acquired from surplus, earthquake reserves, reinsurance arrangement, and complex financial instruments. Contingency plans should ensure smooth operation and claim settlement after an event.

Examiner's report:
Some candidates seemed to answer this question from the old OSFI Earthquake Guideline paper that was on last year's exam. In those cases, we gave partial marks.
Otherwise, there were quite a number of candidates who were able to identify the five key areas and explain them.

Question 34
Answer key:
a)
1. has appropriate Canadian practical experience, which is defined as (1) Work in Canada for at least three of the last six years, (2) of which at least one year was performing valuation of Canadian actuarial liabilities of an insurance company;

2. has experience with the CIA's Standards of Practice and relevant insurance legislation and regulation;

3. is up to date with respect to the CIA's Continuing Professional Development requirement;

4. (1) has not been the subject of an adverse finding by a CIA Disciplinary Tribunal. (2) Where there has been such a finding, the Superintendent may nevertheless conclude that the AA is a suitable person if the circumstances of the case and other information support such a conclusion.

b)
1) Grading Key: **1)** The actuary, whose appointment has been revoked shall submit to the directors of the company and the Superintendent a written statement of the circumstances and **2)** the reasons why, in the actuary's opinion, the actuary's appointment was revoked.

2) The company has to notify the Superintendent in writing of the revocation.
3) The actuary, who intends to consent to become the Appointed Actuary of the company, should request and receive from the company's most recent AA the written statement described in b) above. A

person may consent to be appointed as actuary of a company if no reply is received from the other actuary within fifteen days after a request is made.

c)
1) The audit committee of the company has provided a written statement to the Superintendent that it is satisfied that the duties of both positions in the company will be adequately performed and that the actuarial duties will be performed in an independent manner.
2) The appointment is authorized by the Superintendent.

Actual candidate answer for full marks:
a)
1.) relevant canadian experience – worked in Canada in 3 of last 6 years, one of which involved valuing liabilities for a CDN insurer.
2.) experience with CIA SOP and relevant legislature and regulations.
3.) not been the subject of adverse findings by the CIA disciplinary tribunal.

b)
i.) send written notice to directors and OSFI with circumstances and reasons in the actuary's opinion why his/her appointment was revoked.
ii.) notify OSFI immediately and fill vacancy.
iii.) request written notice from previous actuary on circumstances and reasons and not accept appointment until such notice is received or 15 days have passed.

c)
audit committee must be satisfied that CFO can hold both jobs satisfactorily and independently. Request to be made to OSFI and approval is required from OSFI.

Examiner's report:
This is a key question on the exam and candidates were expected to do very well on parts a) and b). Many of the better candidates received close to full marks on the question however, the average candidate did not give enough detail to receive full marks.

Question 35
Answer key:

Scenario   Description

Scenario	Description
1	No action is required. The impact from the storm will likely not meet the actuary's materiality standard, as the company has little exposure to the Alberta market.
2	Reflect the missing claims in the work. Missing claims that occurred before the calculation date is a data defect and, as such, should be reflected in the work of the actuary.
3	Report the MIG ruling and reflect it in the work, if the company has material exposure in Ontario. The purpose of the AA's report is to report on the entity as it was at the calculation date. If the company writes a lot of business in Ontario, the ruling will make the company different as at calculation date, as many cases that were deemed to be within MIG will now be reopened.

Actual candidate answer for full marks:
1) This is a subsequent event; however due to minimal exposure in Alberta, the impact is likely not material. You should still report the impact to the auditor whose materiality standard may differ.
2) This is a subsequent event resulting from a material error or omission. The actuary must take the missing data into account in the analysis. If the report was already completed, the actuary must withdraw the report and reissue a corrected version.
3) This is a subsequent event that retroactively makes the company different as at the calculation date. You must adjust the analysis to account for this change since the purpose of this analysis is to report on the insurer as they were at the calculation date.

Examiner's report:
A MQC should be able to identify which events would be considered subsequent events and explain the actions of the actuary. Candidates did very well on this question.

Question 36
Answer key:
a)
1) Present Value – the sum of expected future payments after recognizing the time value of money
2) Actuarial Present Value – the sum of the present value and the provision for adverse deviations

b)
1. The method of valuing assets and reporting investment income
2. The allocation of those assets and that income among lines of business
3. The return on the assets at the balance sheet date
4. The yield on assets acquired after the balance sheet date
5. The capital gains and losses on assets sold after the balance sheet date
6. Investment expenses and losses from default (C1 risk)

Actual candidate answer for full marks:
(a)
present value: the estimated cash flows of assets and liabilities discounted at the discount rate.

actuarial present value: the present value and also accounting for the provision for adverse deviations for claims development, reinsurance collectible and investment return rates

(b)
(1) method of valuing the assets and reporting investment income.
(2) return on assets at the balance sheet date
(3) yield of assets after the balance sheet date
(4) allocation of assets among lines of business

Examiner's report:

Some candidates had trouble defining the terms in part a) which should be basic actuarially knowledge. A number of candidates were confused by part b) of the question and it was therefore, not answered well.