Exam 6C

CASUALTY ACTUARIAL SOCIETY
AND THE
CANADIAN INSTITUTE OF ACTUARIES

Canadian Institute of Actuaries / Institut canadien des actuaires

Exam 6-Canada

Regulation and Financial Reporting
(Nation Specific)

April 30, 2019

4 HOURS

INSTRUCTIONS TO CANDIDATES

1. This 69 point examination consists of 26 problem and essay questions.

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

   - Write your Candidate ID number and the examination number, 6C, at the top of each answer sheet. For your Candidate ID number, four boxes are provided corresponding to one box for each digit in your Candidate ID number. If your Candidate ID number is fewer than 4 digits, begin in the first box and do not include leading zeroes. Your name, or any other identifying mark, must not appear.

   - Do not answer more than one question on a single sheet of paper. Write only on the front lined side of the paper – **DO NOT WRITE ON THE BACK OF THE PAPER**. Be careful to give the number of the question you are answering on each sheet. If your response cannot be confined to one page, please use additional sheets of paper as necessary. Clearly mark the question number on each page of the response in addition to using a label such as "Page 1 of 2" on the first sheet of paper and then "Page 2 of 2" on the second sheet of paper.

   - The answer should be concise and confined to the question as posed. When a specified number of items are requested, do not offer more items than requested. For example, if you are requested to provide three items, only the first three responses will be graded.

   - In order to receive full credit or to maximize partial credit on mathematical and computational questions, you must clearly outline your approach in either verbal or mathematical form, showing calculations where necessary. Also, you must clearly specify any additional assumptions you have made to answer the question.

CONTINUE TO NEXT PAGE OF INSTRUCTIONS

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.

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. Interoffice mail is not acceptable.

   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 May 14, 2019.

END OF INSTRUCTIONS

1. (2 points)

   a. (0.75 point)

      Identify three objectives of the Insurance Bureau of Canada.

   b. (1 point)

      Contrast the following two forms of insurance regulation:

      i. Guidelines
      ii. Legislation

   c. (0.25 point)

      Briefly describe how federal legislation protects Canadian insureds of foreign insurance companies.

CONTINUED ON NEXT PAGE

2. (1 point)

Briefly explain whether the following situations are in line with the relevant provincial automobile insurance regulations.

a. (0.25 point)

A private insurer in British Columbia must file its collision and comprehensive coverages rate change and wait for the approval of the insurance regulator before putting the rates into use.

b. (0.25 point)

An insurer in Nova Scotia must file its rate changes to the Nova Scotia Utility and Review Board within a specified period of time after putting the rates into use.

c. (0.25 point)

A private insurer in Quebec may use new rates for property damage coverages before the company's submission of the rate filing with the insurance regulator.

d. (0.25 point)

The Government of Alberta acts as a monopoly providing automobile insurance for transportation network companies.

CONTINUED ON NEXT PAGE

3. (1 point)

   a. (0.5 point)

      Briefly describe the triggers to begin and end coverage under a Transportation Network policy S.P.F. No. 9 for statutory accident benefits.

   b. (0.5 point)

      Briefly describe two situations where an S.P.F. No. 9 policy purchased by a Transportation Network Company would not provide any coverage to a driver logged into the Transportation Network.

CONTINUED ON NEXT PAGE

4. (3.75 points)

A pricing actuary is asked to prepare a filing for a personal automobile insurer in Ontario.

a. (1.25 points)

The insurer's rating algorithm consists of three territories. Assuming the following data is actuarially sound, make a differential proposal that meets the requirements for approval.

Territory	On-Level Trended Earned Premiums (in $million)	One-Way Analysis Indication	Current Differentials
1	52	-6.0%	0.85
2	36	1.0%	1.00
3	23	12.0%	1.05
Total	111	0.0%	

b. (0.5 point)

Briefly describe two conditions that an insurer must meet to submit a simplified filing.

c. (0.75 point)

The management of an insurer has asked the actuary to add the following discounts to its rating algorithm. Assuming the indication for each discount is actuarially sound, briefly explain whether it complies with Ontario regulation.

i. Retiree discount on all coverages
ii. Multi-line discount varying by property product
iii. Good credit discount

d. (0.75 point)

Briefly describe three types of information specifically required to provide adequate support for a usage-based insurance pricing filing.

e. (0.5 point)

Describe the acceptability of a third-party provider program offering additional services using the personal information of the insured collected by the usage-based insurance device.

CONTINUED ON NEXT PAGE

5. (2.25 points)

XYZ is a liability insurer facing the following cases:

- Case A: Insured A is being sued for sexual assault. XYZ is the primary insurer.
- Case B: Insured B is being sued for fraud. XYZ is the primary insurer.
- Case C: Insured C is being sued for negligence for an amount within Insured C's primary limits. XYZ is the excess insurer.

Discuss whether XYZ is likely to have a duty to defend in each case, citing any relevant precedents used to support the conclusion drawn.

CONTINUED ON NEXT PAGE

6. (1.25 points)

   a. (0.5 point)

      Explain the significance of the court case Precision Plating Ltd. v. Axa Pacific Insurance Co. as it applies to exclusions in Commercial General Liability coverage.

   b. (0.75 point)

      Discuss the treatment of mental and behavioral impairment for the purpose of determining catastrophic impairment under statutory accident benefits in Ontario, citing any relevant precedents to support the conclusion drawn.

CONTINUED ON NEXT PAGE

7. (3 points)

   a. (2 points)

      Briefly describe each of the following legal principles and briefly explain a reason each principle is plaintiff-friendly or defendant-friendly:

      i. Joint and several liability
      ii. Gross income wage replacement
      iii. Collateral source rule
      iv. Prejudgment interest

   b. (1 point)

      Identify a reform to each of the legal principles in part a. above that would benefit the counterparty to the one identified in part a. above.

CONTINUED ON NEXT PAGE

8. (1.5 points)

   a. (0.75 point)

      Identify the three insurance mechanisms administered by Facility Association.

   b. (0.75 point)

      For each of the mechanisms identified in part a. above, identify a province in which it operates.

CONTINUED ON NEXT PAGE

9. (3.5 points)

   a. (0.5 point)

      Briefly describe two advantages of bundling flood insurance with other coverages.

   b. (1 point)

      Other than optional vs. bundled coverage, identify four considerations in the financial management of flood risk.

   c. (2 points)

      Describe four preconditions for establishing a strong flood risk management culture.

CONTINUED ON NEXT PAGE

10. (2.25 points)

a. (0.75 point)

   Identify three criteria used to evaluate government insurance programs.

b. (1.5 points)

   Evaluate the performance for each of the following programs based on the criteria identified in part a. above.

   i. PACICC
   ii. United States' National Flood Insurance Program

CONTINUED ON NEXT PAGE

11. (3 points)

a. (2.5 points)

Fully describe the five-part action plan outlined in the Marshall Report to fairly deliver fair benefits to Ontario injured drivers.

b. (0.5 point)

Explain the value gap that exists in the Ontario auto insurance system.

CONTINUED ON NEXT PAGE

12. (2.25 points)

An insured has the following policies and outstanding claims with an insolvent insurance company.

Insurance coverage	Effective Date	Expiration Date	Full-Term Premium	Deductible	Date of Loss
Homeowner	January 1, 2018	December 31, 2018	$1,000	$1,000	February 1, 2018
Mortgage	January 1, 2018	December 31, 2018	$600	$0	February 1, 2018

A winding-up order is made in respect of the insurance company for March 31, 2018.

a. (1.25 points)

Calculate the insured's recovery from PACICC.

b. (0.5 point)

Assuming a distribution of $50,000 is made by the liquidator of the insolvent insurance company, provide an explanation as to the amount of additional recovery the insured will receive.

c. (0.5 point)

Briefly describe two ways PACICC can obtain funding.

CONTINUED ON NEXT PAGE

THIS PAGE IS INTENTIONALLY LEFT BLANK

CONTINUED ON NEXT PAGE

13. (5.75 points)

The following information is available for a federally regulated property and casualty insurance company as at December 31, 2018. All amounts are in thousands of dollars ($000s).

	Capital (Margin) Required at Target
Insurance Risk Margin	
Premium liabilities	?
Unpaid claims	?
Catastrophes	0
Margin required for reinsurance ceded to unregistered reinsurers	0
Market Risk Margin	
Interest rate risk	?
Foreign exchange risk	400
Equity risk	11,000
Real estate risk	0
Other market risk exposures	0
Credit Risk Margin	3,100
Operational Risk Margin	?

Unpaid Claims Margin

Undiscounted unpaid claims - Accident year 2018	100,000
Undiscounted unpaid claims - Accident year 2017	0
Margin for adverse deviations (MfAD) for claims development	12%
Discount rate	3%
MfAD for investment return rates	0.5%
Risk factor for unpaid claims	10%

Premium Liabilities Margin

Net premium liabilities, discounted including Provisions for Adverse Deviations (PfAD)	80,000
Net premium liabilities, discounted excluding PfAD	78,000
Net premium liabilities duration	1.80
Risk factor for premium liabilities	15%

Assets

Bond portfolio market value	128,000
Bond portfolio modified duration	3.1
Risk factor for interest rate risk	1.25%

CONTINUED ON NEXT PAGE

Operational Risk Margin	Value	Risk Factor
Direct written premium in 2018	150,000	2.5%
Direct written premium in 2017	100,000	n/a
Reinsurance premium ceded in 2018	4,500	2.5%
Risk factor for premium growth beyond 20% threshold	n/a	2.5%
Risk factor applied to total capital required (before the operational risk margin and diversification credit) for the calculation of the operational risk margin	n/a	8.5%
Correlation factor between asset risk margin and insurance risk margin	n/a	50%

Capital Available	82,000

The cumulative accident year claim payment pattern is as follows:

Age (Months)	% Paid
12	25%
24	50%
36	75%
48	100%

The company began operations in 2017.

Calculate the Minimum Capital Test (MCT) ratio.

CONTINUED ON NEXT PAGE

14. (4.75 points)

The following information is available for the valuation of the premium liabilities as at December 31, 2018. All amounts are in thousands of dollars ($000s).

Net written premium in the last 12 months	100,000
Gross unearned premium	65,000
Net unearned premium	55,000
Selected general expense ratio	28%
Portion of expenses related to policy servicing cost	25%
Expected reinsurance premium	4,000
Gross present value losses and loss adjustment expenses (LAE)	51,900
Projected net undiscounted loss ratio including LAE	80%
Discount rate	3%
MfAD for claims development	6%
MfAD for recovery from reinsurance ceded	0.5%
MfAD for investment return rates	0.25%
Contingent commission	2,000
Unearned commission	2,700
MCT risk factor for premium liabilities	15%
Initial Deferred Policy Acquisition Expense (DPAE)	6,500

The cumulative accident year claim payment pattern is as follows:

Age (Months)	% Paid
12	40%
24	100%

a. (2.5 points)

Calculate the net premium liabilities as at December 31, 2018.

b. (0.5 point)

Determine whether the initial DPAE should be reduced.

<< QUESTION 14 CONTINUED ON NEXT PAGE >>

c. (0.75 point)

Fully explain the impact on the return on equity (ROE) of a reduction of the initial DPAE.

d. (0.5 point)

Identify two different evaluation methods on which the projected loss ratios underlying the premium liabilities can be based.

e. (0.5 point)

Calculate the capital required at target for premium liabilities in the MCT.

CONTINUED ON NEXT PAGE

15. (2.5 points)

The following information is provided for a federally-regulated property and casualty insurance company as at December 31, 2018. All amounts are in thousands of dollars ($000s).

Incremental Paid				
AY*	12	24	36	48
2015	8,500	2,000	500	250
2016	8,000	1,500	1,000	
2017	9,000	5,000		
2018	10,000			

Actuarial Present Value Ultimate				
AY*	12	24	36	48
2015	16,000	16,500	17,250	17,250
2016	14,200	15,500	16,000	
2017	18,500	20,100		
2018	20,250			

* Accident year

Discounted excess/(deficiency) ratio:

Calendar Year	Accident Years 2015 and Prior	Accident Years 2016 and Prior	Accident Years 2017 and Prior
2016	-4%		
2017	-12%	-14%	
2018	-10%	-16%	-7%

Other information:

- The investment yield is 2.5% for all years.
- The company started writing business in 2015.

a. (0.75 point)

Calculate the investment income on unpaid claims for accident year 2015 in calendar year 2018.

b. (1.25 points)

Calculate the cumulative discounted excess/(deficiency) ratio for accident year 2016 as at December 31, 2018.

c. (0.5 point)

Analyze the discounted excess/(deficiency) ratio exhibit from the perspective of the Office of the Superintendent of Financial Institutions (OSFI).

CONTINUED ON NEXT PAGE

16. (1.5 points)

The following information is provided for a federally-regulated property and casualty insurance company as at December 31, 2018. All amounts are in thousands of dollars ($000s).

Net undiscounted policy liabilities	34,500
Net discounted policy liabilities excluding PfADs	31,600

PfADs

Claims development	4,100
Recovery from reinsurance ceded	220
Investment return rates	150

Other information:

- The reserve carried in the P&C Annual Return is $37,000.
- The future income tax rate is 35%.

a. (0.5 point)

Define the asset for future income taxes.

b. (1 point)

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

CONTINUED ON NEXT PAGE

17. (2 points)

The following information is available for a property and casualty insurance company as at December 31, 2018.

Risk cost of capital	10%
Risk-free interest rate	2%
Required margin (as a percentage of claims liabilities)	15%
Target capital to required capital ratio	3.0
Undiscounted value of liabilities to be commuted	$5,000,000

Calendar year liability payment pattern:

2019	50%
2020	30%
2021	20%

All claim payments are made mid-year.

Calculate the commuted value of claims as at December 31, 2018.

CONTINUED ON NEXT PAGE

18. (4.75 points)

The following information is available for a federally-regulated property and casualty insurance company as at December 31, 2018. All amounts are in thousands of dollars ($000s).

Probable Maximum Loss (PML) 500, East Canada	90,000
PML 500, West Canada	350,000
PML 250, East Canada	25,000
PML 250, West Canada	130,000
Common shares issued and paid	60,000
Retained earnings	155,000
Accumulated other comprehensive income	45,000
Earthquake premium reserve	10,000
Nuclear and contingency reserves	0

The company has the following reinsurance coverage for any earthquake occurrence:

Layer	Ceded to Reinsurers
75,000 xs 25,000	90%
100,000 xs 100,000	100%
50,000 xs 200,000	50%

The insurance company is progressively phasing in from a 420-year return period in 2014 to a 500-year return period in 2022.

a. (2.25 points)

Calculate the insurance company's margin required for catastrophes at target as at December 31, 2018.

b. (1 point)

Fully explain the impact on the MCT components of a decrease in the earthquake reserves.

c. (0.5 point)

Explain how personal property earthquake exposures impact the surplus used in A.M. Best's BCAR score.

d. (1 point)

Briefly describe four qualitative earthquake risk management practices that would improve the A.M. Best rating with respect to the catastrophe analysis.

CONTINUED ON NEXT PAGE

19. (2.5 points)

The following information from the Dynamic Capital Adequacy Testing (DCAT) analysis of a federally regulated property and casualty insurance company is available as at December 31, 2018.

Scenario	Variable	2019	2020	2021	2022
Base scenario	MCT Ratio	215%	240%	250%	265%
	Assets	1,000,000	1,100,000	1,210,000	1,331,000
	Liabilities	700,000	770,000	847,000	931,700
Frequency/ severity (loss ratio)	MCT Ratio	215%	170%	125%	146%
	Assets	1,000,000	944,000	890,400	919,440
	Liabilities	700,000	714,000	727,400	720,140
Misestimation of policy liabilities (unpaid claims)	MCT Ratio	215.0%	-18.2%	11.2%	40.4%
	Assets	1,000,000	744,000	770,400	799,440
	Liabilities	700,000	764,000	757,400	750,140
Combined economic scenario	MCT Ratio	215.0%	114.1%	148.8%	182.2%
	Assets	1,000,000	802,000	831,700	864,370
	Liabilities	700,000	722,000	718,700	715,070

Internal Target: 200%

a. (0.5 point)

Describe the requirements of a DCAT base scenario.

b. (0.5 point)

Assess whether or not the company is in satisfactory financial condition.

c. (0.5 point)

Identify two possible management actions that the actuary may consider under the misestimation of policy liabilities scenario.

d. (0.5 point)

Identify two possible ripple effects that the actuary may consider under the frequency/severity (loss ratio) scenario.

e. (0.5 point)

A catastrophic event occurs after the report is completed, but before the presentation to the Board is made. Describe the actions that the Appointed Actuary (AA) should take.

CONTINUED ON NEXT PAGE

THIS PAGE IS INTENTIONALLY LEFT BLANK

CONTINUED ON NEXT PAGE

20. (3 points)

Given the following information, identify four ways in which the AA likely did not follow the appropriate standards of practice or educational guidance and describe what the appropriate action should have been in each instance.

An AA for a federally-regulated property and casualty insurance company prepared the calculation of premium liabilities associated with the unexpired portion of in-force insurance contracts. The company had no swing-rated policies or inter-company pooling arrangements, but had implemented rate decreases on all lines within the last three months.

First, she collected the following elements and included them in her analysis:

- Unearned premium reserve
- Deferred policy acquisition expenses
- Unearned (ceded) commission
- Deferred tax assets
- Expected adjustments to premiums as a result of audits, late reporting and endorsements
- Expected commission adjustments on policies with variable commissions

Next, the AA determined the future claims and adjustment expenses associated with the unearned premium. For most lines of business, the AA selected future expected loss ratios using the valuation of claims liabilities. However, for two specific lines of business, she used a separate ad hoc analysis. Some expected loss ratios were adjusted to the future period during which the unearned premium will be earned, while the rest were kept at the historically observed levels.

When the AA discounted the expected losses and adjustment expenses associated with the unearned premium, the AA used the same discount rate, payment patterns and discounting periods that were used for the claim liabilities. Most MfADs were also the same as those used for the claim liabilities. For two lines of business, however, the MfADs differed materially from those used for the claim liabilities. No discounting was applied to the maintenance expenses or future reinsurance costs as it was not deemed material.

The AA calculated a positive equity in the unearned premium, as follows:

Net unearned premium
+ Unearned reinsurance commissions
- Premium deficiency
- Net policy liabilities in connection with unearned premium

<< QUESTION 20 CONTINUED ON NEXT PAGE >>

As the equity in the unearned premium was lower than the DPAE, the AA set up a premium deficiency equal to the difference. This amount was booked as a liability in the company's P&C Annual Return, page 20.20.

As the AA prepared the final report, she became aware of two potential subsequent events: a calculation error and a court decision that would affect claim costs.

The AA determined that the calculation error was not material since its size would not affect the decisions of senior management or the directors of the company. If it had been material, the AA determined that it would have required adjustment in her work.

The court decision occurred before the calculation date and was determined to be material. The court decision made the entity different, and the purpose of the work was to report on the company as it was at the calculation date. The AA described the event in the report, but did not reflect its impact in the work.

CONTINUED ON NEXT PAGE

21. (3.5 points)

The following information is available for a federally-regulated property and casualty insurance company as at December 31, 2018. All amounts are in thousands of dollars ($000s).

Statement of Financial Position

	Current Year	Prior Year
Cash	10,000	8,000
Bonds and debentures	45,000	50,000
Common shares	3,000	2,500
Real estate	15,000	20,000
Agents and brokers receivables	1,000	1,250
Unearned premiums recoverable	11,500	12,500
Unpaid claim and adjustment expenses recoverable	?	?
Total assets	120,000	112,500
Gross unpaid claims and adjustment expenses	45,000	42,500
Equity	40,000	37,500

Statement of Income

	Current Year	Prior Year
Net premiums written	45,000	47,500
Decrease (increase) in net unearned premiums	1,500	1,250
Net claims and adjustment expenses	40,000	37,500
Net acquisition expenses	7,500	7,500
General expenses	3,500	4,000
Investment income	7,500	5,000
Realized gains (losses)	(1,000)	500
Investment expenses	800	600
Total income taxes	1,000	1,250

The net leverage ratio at the end of the current year is 250%.

All of the company's reinsurance is placed with an unregistered reinsurer without collateral.

<< QUESTION 21 CONTINUED ON NEXT PAGE >>

a. (1.75 points)

Calculate each of the following ratios as at December 31, 2018:

i. Investment yield
ii. Return on equity
iii. Return on assets
iv. Net underwriting leverage ratio

b. (1 point)

Based on three ratios calculated in part a. above or any information given, comment on the company's financial health.

c. (0.75 point)

Calculate the unpaid claims and adjustment expenses recoverable at the end of 2018.

CONTINUED ON NEXT PAGE

22. (1.75 points)

a. (0.75 point)

Briefly describe three reasons most insurance companies require a rating by a recognized rating agency.

b. (1 point)

Identify two lines of business or types of insurance where high financial ratings are particularly important and briefly explain the reasons.

CONTINUED ON NEXT PAGE

23. (2.5 points)

a. (0.5 point)

Describe the concept of materiality.

b. (1 point)

Identify four characteristics of an insurance company that may affect the materiality level.

c. (0.5 point)

Identify two considerations regarding the disclosure of the materiality level within the actuarial work product.

d. (0.5 point)

Describe the difference between the materiality level for DCAT work and the materiality level for valuation work.

CONTINUED ON NEXT PAGE

24. (2 points)

a. (1 point)

The Canadian Institute of Actuaries' Standards of Practice specify the ranges of MfAD. Identify the ranges for the claims development MfAD and the investment return rate MfAD and for each, briefly describe one situation where the margin can be selected outside of these ranges.

b. (1 point)

Briefly describe four desirable risk margin characteristics.

CONTINUED ON NEXT PAGE

25. (3.75 points)

a. (1 point)

Briefly describe four OSFI expectations with respect to the external peer reviewer.

b. (0.5 point)

Describe the peer review cycle required by OSFI.

c. (1 point)

Describe two differences in the responsibilities of an external peer reviewer and an external auditor.

d. (1.25 points)

Situation	Information available about the Fellow of the Canadian Institute of Actuaries (FCIA)
A	FCIA A worked at ABC under the AA for three years, and left four years ago to join a consulting firm where she has been acting as AA for three different Canadian insurance companies since joining. She exercised all ABC stock options and sold all shares one year ago.
B	FCIA B works at a small consulting firm. Most of his work relates to ratemaking. The extent of his experience with the valuation of policy liabilities is with respect to the work that he has completed for Company DEF, for which he acted as AA for the last fifteen years.
C	FCIA C is a policyholder of ABC and he invested in a mutual fund which owns shares of ABC.
D	FCIA D works in a consulting firm. Her colleague was involved in the external audit of ABC this year.
E	FCIA E works in a consulting firm. His colleague is involved in the actuarial work related to financial condition reporting for ABC this year.

ABC Insurance Company (ABC) is a federally regulated insurance company. For each of the above situations, justify whether the respective FCIA is eligible to serve as the peer reviewer of ABC's AA Report.

CONTINUED ON NEXT PAGE

26. (2 points)

a. (0.5 point)

Briefly describe the following terms:

i. Model
ii. Model risk

b. (1.5 points)

In evaluating model risk exposure, an actuary can assess the severity and likelihood of failure in a model. Identify three considerations for each of the following metrics:

i. Severity of model failure
ii. Likelihood of model failure

END OF EXAMINATION

Exam 6C
Regulation and Financial Reporting

POINT VALUE OF QUESTIONS

QUESTION	TOTAL POINT VALUE OF QUESTON	SUB-PART OF QUESTION (a)	(b)	(c)	(d)	(e)	(f)	(g)
1	2.00	0.75	1.00	0.25				
2	1.00	0.25	0.25	0.25	0.25			
3	1.00	0.50	0.50					
4	3.75	1.25	0.50	0.75	0.75	0.50		
5	2.25	2.25						
6	1.25	0.50	0.75					
7	3.00	2.00	1.00					
8	1.50	0.75	0.75					
9	3.50	0.50	1.00	2.00				
10	2.25	0.75	1.50					
11	3.00	2.50	0.50					
12	2.25	1.25	0.50	0.50				
13	5.75	5.75						
14	4.75	2.50	0.50	0.75	0.50	0.50		
15	2.50	0.75	1.25	0.50				
16	1.50	0.50	1.00					
17	2.00	2.00						
18	4.75	2.25	1.00	0.50	1.00			
19	2.50	0.50	0.50	0.50	0.50	0.50		
20	3.00	3.00						
21	3.50	1.75	1.00	0.75				
22	1.75	0.75	1.00					
23	2.50	0.50	1.00	0.50	0.50			
24	2.00	1.00	1.00					
25	3.75	1.00	0.50	1.00	1.25			
26	2.00	0.50	1.50					
27	0.00							
28	0.00							
29	0.00							
30	0.00							
31	0.00							
32	0.00							
33	0.00							
34	0.00							
35	0.00							
36	0.00							
37	0.00							
38	0.00							
39	0.00							
40	0.00							
41	0.00							
42	0.00							
43	0.00							
44	0.00							
45	0.00							
TOTAL	69.00							

SPRING 2019 EXAM 6C EXAMINER'S REPORT

The Syllabus and Examination Committee has prepared this Examiner's Report as a tool for candidates preparing to sit for a future offering of this exam. The Examiner's Report provides:

- A summary of exam statistics.
- General observations by the Syllabus and Examination Committee on candidate performance.
- A question-by-question narrative, describing where points were commonly achieved and missed by the candidates.

The report is intended to provide insight into what the graders for each question were looking for in responses that received full or nearly-full credit. This includes an explanation of common mistakes and oversights among candidates. We hope that the report aids candidates in mastering the material covered on the exam by providing valuable insights into the differences between responses that are comprehensive and those that are lacking in some way.

Candidates are encouraged to review the Future Fellows article from June 2013 entitled "Getting the Most out of the Examiner's Report" for additional insights.

EXAM STATISTICS:

- Number of Candidates: 167
- Available Points: 69
- Passing Score: 51.5
- Number of Passing Candidates: 83
- Raw Pass Ratio: 49.7%
- Effective Pass Ratio: 53.2%

The Syllabus and Examination Committee hope that the details by question provided throughout this Examiner's Report will be helpful to all candidates. In addition, the Syllabus and Examination Committee would like to provide general comments on the candidate performance on this exam. We found that the candidates are generally underperforming on Part C of the syllabus. Part C is the most important part within this exam and we urged the candidate to put more effort into this part of the syllabus.

GENERAL COMMENTS:

- Candidates should note that the instructions to the exam explicitly say to show all work; graders expect to see enough support on the candidate's answer sheet to follow the calculations performed. While the graders made every attempt to follow calculations that were not well-documented, lack of documentation may result in the deduction of points where the calculations cannot be followed or are not sufficiently supported.

- Candidates should justify all selections when prompted to do so. For example, if the candidate selects an all year average and the candidate prompts a justification of all selections, a brief explanation should be provided for the reasoning behind this selection.
- Incorrect responses in one part of a question did not preclude candidates from receiving credit for correct work on subsequent parts of the question that depended upon that response.
- Candidates should try to be cognizant of the way an exam question is worded. They must look for key words such as “briefly” or “fully” within the problem. We refer candidates to the Future Fellows article from December 2009 entitled “The Importance of Adverbs” for additional information on this topic.
- Some candidates provided lengthy responses to a “briefly describe” question, which does not provide extra credit and only takes up additional time during the exam.
- Candidates should note that the sample answers provided in the examiner’s report are not an exhaustive representation of all responses given credit during grading, but rather the most common correct responses.
- In cases where a given number of items were requested (e.g., “three reasons” or “two scenarios”), the examiner’s report often provides more sample answers than the requested number. The additional responses are provided for educational value, and would not have resulted in any additional credit for candidates who provided more than the requested number of responses. Candidates are reminded that, per the instructions to the exam, when a specific number of items is requested, only the items adding up to that number will be graded (i.e., if two items are requested and three are provided, only the first two are graded).
- It should be noted that all exam questions have been written and graded based on information included in materials that have been directly referenced in the official syllabus, which is located on the CAS website. The CAS takes no responsibility for the content of supplementary study materials and/or manuals produced by outside corporations and/or individuals which are not directly referenced in the official syllabus.

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 1	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): A1**

SAMPLE ANSWERS

Part a: 0.75 point

Sample

- Study legislation
- Engage in market research
- Discuss general insurance

Alternate answers

- Raise public awareness and understanding of P&C insurance and the risks
- Collect & analyze statistical / actuarial

Part b: 1 point

Sample

- Guidelines are more flexible & adaptable than legislation
- Changes to legislation must go through the senate, house of commons and the royal approval, while guidelines don't need to go through these steps

Alternate answers

- Guidelines are interpreted rules on how things should be done
- Legislation are hard rules on how to do things & not up for interpretation
- Guidelines are preferred over legislation as they are more flexible, don't need any regulatory approval & less likely to be misinterpreted in court
- Guidelines are less obtrusive

Part c: 0.25 point

Sample 1

- Forces minimum amount of assets held in Canada for recovery in insolvency

Sample 2

- Foreign insurer has to vest assets > 5 million in Canadian fund subject to control of minister of finance

EXAMINER'S REPORT

Candidates were expected to understand the role of the Insurance Bureau of Canada, understand the difference between legislation and guidelines, and know how federal legislation protects Canadian insureds of foreign insurance companies.

Part a

Candidates were expected to understand the objectives of the Insurance Bureau of Canada.

Common errors included:

- Answering along the lines of affordability/availability and rate approval

Part b

Candidates were expected to understand the difference between legislation and guidelines.
 	
Common errors included:
• Failing to contrast or explaining why a contrast exists, for example:
    o Stating "guidelines need disclosure" without commenting on legislation
    o Stating "legislation is interpreted" without commenting on guidelines

Part c
Candidates were expected know how federal legislation protects Canadian insureds of foreign insurance companies. Common errors included: • Not relating the answer to assets held in Canada, for example: o Being licensed in Canada

SAMPLE ANSWERS AND EXAMINER'S REPORT

<table>
<tr><td colspan="2">QUESTION 2</td></tr>
<tr><td>TOTAL POINT VALUE: 1</td><td>LEARNING OBJECTIVE(S): A2</td></tr>
<tr><td colspan="2">SAMPLE ANSWERS</td></tr>
<tr><td colspan="2">Part a: 0.25 point</td></tr>
<tr><td colspan="2"><u>Sample 1</u>
False, optional coverage in BC is open competition.

<u>Sample 2</u>
No, insurers are not required to file for optional coverages in BC.</td></tr>
<tr><td colspan="2">Part b: 0.25 point</td></tr>
<tr><td colspan="2"><u>Sample 1</u>
False, Nova Scotia requires filing to be approved before using rates.

<u>Sample 2</u>
No, in Nova Scotia the system is prior approval.</td></tr>
<tr><td colspan="2">Part c: 0.25 point</td></tr>
<tr><td colspan="2"><u>Sample</u>
Yes, property damage coverage in Quebec is under use and file.</td></tr>
<tr><td colspan="2">Part d: 0.25 point</td></tr>
<tr><td colspan="2"><u>Sample 1</u>
No, TNC insurance is provided by private insurance companies.

<u>Sample 2</u>
Not in line, SPF9 is provided by private insurers.</td></tr>
<tr><td colspan="2">EXAMINER'S REPORT</td></tr>
<tr><td colspan="2">Candidates were expected to have knowledge of the rate regulations in different provinces in Canada.</td></tr>
<tr><td colspan="2">Part a</td></tr>
<tr><td colspan="2">Candidates were expected to demonstrate knowledge of the rate regulatory approach in British Columbia.

Common errors included:
Stating that private insurers cannot provide optional coverages in British Columbia
Stating that the government is the only provider of insurance in British Columbia</td></tr>
<tr><td colspan="2">Part b</td></tr>
<tr><td colspan="2">Candidates were expected to demonstrate knowledge of the rate regulatory approach in Nova Scotia.

Common errors included:</td></tr>
</table>

- Agreeing with the situation
- Answering "No" without providing a justification
- Providing an incorrect rate regulatory approach as a justification

Part c

Candidates were expected to demonstrate knowledge of the rate regulatory approach in Quebec.

Common errors included:

- Confusing automobile property damage with property coverage
- Providing no justification

Part d

Candidates were expected to demonstrate knowledge of the rate regulatory approach in Alberta.

Common errors included:

- Agreeing with the situation
- Justifying that both government and private insurers provide insurance for TNC in Alberta

QUESTION 3	
TOTAL POINT VALUE: 1	**LEARNING OBJECTIVE(S): A2**
SAMPLE ANSWERS	
Part a: 0.5 point	
Sample 1 Begin: logged into the TNC app End: logged off TNC app *Sample 2* Begin: logged into the TNC app End: last passenger left	
Part b: 0.5 point	
Sample • When transporting merchandise • When providing transport from client after being called on the street (clients did not use app first)	
EXAMINER'S REPORT	
Candidate were expected to demonstrate some knowledge of the Transportation Network policy S.P.F. No. 9.	
Part a	
Candidates were expected to identify the moment when the policy would become active and when coverage would end. Common errors included: • Describing periods 0 through 3 as outlined in the guideline but not mentioning whether the coverage applies • Stating that coverage starts when the driver accepts a ride request as there can be AB coverage in period 1	
Part b	
Candidates were expected to identify when coverage does not apply even if a driver is logged into the Transportation Network. Common errors included: • Not mentioning the transport of cargo or the transport of a street-hailed passenger • Mentioning situations that only apply to the physical damage coverage such as drunk driving, unlicensed driving, fraud, and other policy exclusions	

QUESTION 4

TOTAL POINT VALUE: 3.75 | **LEARNING OBJECTIVE(S): C2**

SAMPLE ANSWERS

Part a: 1.25 points

Sample

Proposed change in same direction as indicated, but to a lesser extent, maximum |10%|.

Terr	OLEP	Curr. Diff	Indicated Diff.	Capped Diff. @10%	Off-Balance
1	52	0.85	.799	.799	.7981
2	36	1.00	1.01	1.01	1.0088
3	23	1.05	1.176	1.155	1.1537
Total	111	.9401	0.9455	.9412	.9401

Part b: 0.5 point

Sample 1

- The overall rate change must be 0% or less.
- Proposed territorial differential and relativities between -15% an 5%.

Sample 2

- No rating algorithm change other than new discount if new discount has been introduced by other companies
- Overall rate change ≤ 0%

Part c: 0.75 point

Sample 1

i) Yes, it is even required
ii) Multi-line discount can be introduced but it should not vary by property product. Using net worth or the fact whether the insured has a home is prohibited as auto rating variable.
iii) The fact whether insured has a credit card, the credit history and credit rating are all prohibited to be used as auto rating variable. So they don't comply with Ontario regulation.

Sample 2

i) Yes, discounts to retirees are allowed
ii) No, multi-line discount varying by property product is not allowed
iii) No, cannot use credit rating in rating process

Part d: 0.75 point

Sample 1

- What data is collected from driver (acceleration, speed, etc.)
- How it is measured: threshold, frequency, occurrence.
- The period that data is being collected for

Sample 2

- What is measured (acceleration, braking)
- How is it being measured (thresholds)
- All data to support filing (including how discounts are determined)

Part e: 0.5 point

Sample 1

- Insured should not be required to join the program
- Should be actively opt-in rather than opt-out

Sample 2

It is accepted, but the insurer must make sure that the third party has at least the same privacy standards. Regarding the use of credit scores, the opt-in applies to third party also meaning that it can't use information of UBIP program without the consent of the insured.

EXAMINER'S REPORT

Candidates were expected to know the various regulatory requirements with respect to automobile insurance in Ontario.

Part a

Candidates were expected to provide a rate change proposal that is in line with regulatory requirements in Ontario. Listing requirements without making a proposal would not be sufficient to receive full marks.

Answers for both simplified filings and major filings were accepted.

Common errors included:

- Not rebasing of the proposed differentials before calculating the proposed changes
- Proposing rate changes that were outside the maximum change allowed by territory

Part b

Candidates were expected to know the conditions for submitting a simplified filing.

A common error was stating that the overall rate change must be below 0% when it should be less than or equal to 0%.

Part c

Candidates were expected to know required and prohibited elements of a rate and risk classification system in Ontario Automobile Insurance.

Common errors included:

- Stating that the multi-line discount is permitted. It is allowed but it cannot vary by property product.
- Stating that the retiree discount is not allowed since employment cannot be used as information.

Part d
Candidates were expected to know the types of information specifically required for submitting a filing for UBIP. A common error was providing a response that was not being specific enough, for example, stating only "data" as an answer by itself.
Part e
Candidates were expected to know the expectations toward a third party for providing UBIP additional services. A common error was stating that this is not allowed when it is allowed if the insured gave their consent.

QUESTION 5	
TOTAL POINT VALUE: 2.25	**LEARNING OBJECTIVE(S): A3, A4**
SAMPLE ANSWERS	

Sample
Case A:
XYZ has no duty to defend
Sansalone v. Wawanesa
It is intentional act, and injury is possible result of the action. So the injury caused by intentional action which is beyond coverage. So no duty to indemnify.

Case B:
XYZ has no duty to defend
Nichols v. American Home
Fraud is excluded in policy. Duty to defend triggered by duty to indemnify. So no duty to indemnify

Case C:
XYZ has duty to defend
Alie v. Bertrand
Excess policy without specific exclusion follows the form of underlying policy. So it has duty to indemnify => duty to defend

Case C alternate sample
Case C:
Unlikely to have duty to defend
Case: Alie v. Bertrand & Frere
In this case, it was ruled that excess insurer's duty to defend follow the policy terms of the underlying policy (unless specifically exclude duty to defend) since the amount isn't in excess of the primary limits, the excess isn't triggered and there is no duty to defend (would have if limit was breached)

EXAMINER'S REPORT

Candidates were expected to understand the relationship between having a duty to indemnify and a duty to defend. Candidates were also expected to know why there was no duty to indemnify.

For Case C, candidates had to either explain why the excess insurer had a duty to defend or explain that there is no duty to defend provided the amount is within the primary limits.

A common error included:

- For all cases, stating that there was no duty to defend but not providing an explanation based on an actual court case

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 6	
TOTAL POINT VALUE: 1.25	**LEARNING OBJECTIVE(S): A3**
SAMPLE ANSWERS	
Part a: 0.5 point	
Sample What is critical is not the cause of loss, but the cause of liability. The claim arose from pollution damages, but pollution was excluded so the insurer had no obligation to payout and potential for the insurer's liability to arise. So even though fire was a concurrent cause of loss, the claim was for pollution damages, an excluded item.	
Part b: 0.75 point	
Sample 1 Kusnierz v. Economical The mental and behavioral impairment can be combined with physical impairment in order to determine CAT claims. Reasoning: 1) SABS doesn't expressly allow for the combination but also doesn't forbid the combination. 2) The combination is consistent with the Guidelines 3) It would be unfair for the CAT impaired people who fall into multiple categories than for those who only fall into one physical impairment category Implication → It will increase the number of people who would be classified as catastrophically impaired. But due to its given rarity it would impact too much. *Sample 2* Aviva v. Pastore Class 4 designation can be made if only 1 of daily life, social life work activities or concentration is impaired. Doesn't need all to be impaired. Also can use cumulative approach if mental cannot be separated from physical in assessment process. Pastore was judged based on only daily life being impaired and was judged cumulatively because it was not possible to separate mental from physical.	
EXAMINER'S REPORT	
Candidate were expected to demonstrate knowledge of specific landmark decisions.	
Part a	
Candidates had to articulate the impact of the legal case Pacific Plating vs Axa on commercial fire policy coverage or the reasoning being the decision. A common error included: • Providing incomplete explanations	
Part b	

Candidates were expected explain that mental and physical impairment can be combined or that catastrophic impairment in one of the four categories is sufficient to determine catastrophic impairment in Ontario. A court case citation was also expected.

Common errors included:

- Not citing at least one of the two relevant court cases.
- Not providing details on the reasoning behind the decisions.
- Stating that mental and physical impairment cannot be combined. (This ruling was overturned and was not the conclusion of the cases.)

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 7	
TOTAL POINT VALUE: 3	**LEARNING OBJECTIVE(S): A4**
SAMPLE ANSWERS	
Part a: 2 points	
<u>*Sample*</u> J&S: Plaintiff can recover any or all damages from any or all defendants regardless of share of liability plaintiff friendly = plaintiff fully compensated for loss even if one defendant unable to pay Use of gross income in calculation of income replacement in case where plaintiff can no longer work plaintiff friendly = receives more money than if working -> no taxes, lower expenses because not traveling for work Cannot admit any other sources of recovery for plaintiff in a case plaintiff friendly = plaintiff can recover once from insurance and once from tortfeasor Interest awarded for time between event date or date of filing of the lawsuit and award settlement. Interest on award plaintiff friendly = plaintiff is fully compensated	
Part b: 1 point	
<u>*Sample 1*</u> Replace with proportional liability Switch compensation from gross to net Eliminate collateral source rule Eliminate prejudgment interest <u>*Sample 2*</u> Eliminate J&S liability and replace with proportional liability system Change the base to net income Eliminate collateral source rule and allow the evidence of plaintiff's other financial recoveries be considered at trial Reduce prejudgment interest	
EXAMINER'S REPORT	
Candidates were expected to be able to describe several legal principles, explain if each favours the defendant or plaintiff, and identify reforms to the principles.	
Part a	
Candidates were expected to describe several legal principles and provide an explanation as to why the legal principles were plaintiff-friendly or not. A common error included: • Mentioning that the principle was plaintiff-friendly but not providing an explanation	

Part b
Candidates were expected to provide a plausible reform that would shift the favour balance between plaintiff and defendant. There were no common errors on this sub-part.

QUESTION 8	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): B@**
SAMPLE ANSWERS	
Part a: 0.75 point	
Sample • FARM • RSP • UAF	
Part b: 0.75 point	
Sample • FARM: ON • RSP: ON • UAF: NB	
EXAMINER'S REPORT	
Candidates were expected to demonstrate knowledge of the mechanisms administered by the Facility Association.	
Part a	
Candidates were expected to know the three insurance mechanisms administered by Facility Association. A common error included: • Not mentioning the Uninsured Motorist Fund	
Part b	
Candidate were expected to identify a province where each mechanism is administered by the Facility Association. Common errors included: • Listing Ontario as a province where the Facility Association administers the Uninsured Motorist Fund; the FA does not administer Ontario's Motor Vehicle Accident Claims Fund • Listing a province with a crown corporation insurer (BC, SK, MB, QC) as an example for FARM or RSP	

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 9	
TOTAL POINT VALUE: 3.5	**LEARNING OBJECTIVE(S): B2, B3**
SAMPLE ANSWERS	
Part a: 0.5 point	
Sample 1 • Reduce adverse selection since not only high-risk insured will purchase flood insurance • Make flood insurance more affordable *Sample 2* • It favors higher take up rate leading to more people being covered in the event of a flood • Promote affordability of flood insurance with low risks subsidizing high risks	
Part b: 1 point	
Sample Answers (any four of the following) • Private vs publicly administered programs • Voluntary vs mandatory insurance take-up • Risk-based vs government mandated pricing • Policyholder funded vs taxpayer funded subsidization of high-risk properties (or neither) • Government as insurer vs enabler of insurance	
Part c: 2 points	
Sample 1 • Accurate and up-to-date maps for flood planning and risk management • Targeted and on-going investment in flood defenses and infrastructures • Widespread risk awareness and a sound understanding by all stakeholders of the physical and financial damages of flood risk • Limited resource to government funding for post disaster-compensation to ensure individual incentives for risk mitigation *Sample 2* • Effective flood maps: accurate in order to understand the risk and help make decisions on mitigation investment • Infrastructure: investment in infrastructure to maintain strong flood defences • Awareness: policyholders has to be aware of risk mitigation and financial management for flood • Risk mitigation incentives: limited recourse to government revenue to finance post-disaster compensation	
EXAMINER'S REPORT	
Candidates were expected to understand the objectives, operations, and effectiveness of flood insurance.	
Part a	
Candidates were expected to describe two advantages of bundling flood insurance.	

Common errors included:

- Identifying low risks subsidizing high risks as an advantage without stating that premium will be more affordable
- Repeating the same topic in different wording

Part b

Candidates were expected to understand the different considerations of the financial management of flood risk and to identify four beside the "Optional vs bundled coverage"

Common errors included:

- Providing fewer than four considerations
- Providing incomplete answers such as "rates"

Part c

Candidates were expected to understand the importance of the role of the government to provide appropriate conditions for managing flood risks even though the private insurance remains the main provider. They were expected to address four topics:

- Flood maps
- Infrastructure / investment
- Awareness
- Diminished government funding

Common errors included:

- Repeating the same topic twice using different words
- Providing fewer than four preconditions
- Identifying a topic without describing it

QUESTION 10	
TOTAL POINT VALUE: 2.25	**LEARNING OBJECTIVE(S): B2-B3**
SAMPLE ANSWERS	
Part a: 0.75 point	
Sample • Insurance or welfare • Necessary • Efficient	
Part b: 1.5 points	
Sample PACICC: 1. Insurance → Yes (sort of) members pay assessment fees 2. Necessary → Yes. Helps policyholders recoup some money after the insurer has become insolvent. 3. Efficient → Yes. Process already in place, self-sustainable OSFI requires insurers to have MCT > 150% US Flood: 1. Insurance →Yes, people pay premiums before loss, and only those that incur losses are indemnified. 2. Necessary → Yes, flood insurance is a major concern due to changing weather and other conditions. Private coverage not enough therefore National Flood Ins. Program necessary to fill needs. 3. Efficient → Yes, as government programs are already undertaking some of the work in other departments e.g. property valuation etc. reduces cost, no commission, lower cost. *Alternate solutions* Arguments could be made on both sides of each evaluation criteria. Sample solutions included: PACICC: • Welfare since policyholder don't pay premium • Welfare as could recover full amount if covered by private insurance instead of limited amount US Flood: • Welfare as premiums are subsidized by government • Unnecessary since could be covered by private insurer • Inefficient as public acceptance is low as flood insurance increases debt and is run at a deficit	
EXAMINER'S REPORT	
Candidates were expected to demonstrate knowledge of the government insurance program evaluation criteria.	
Part a	
Candidates were expected to correctly identify the evaluation criteria of a government program.	

A common error was providing a common insurance concept as an answer instead of the required evaluation criteria such as:

- Consumer protection
- Affordability

Part b

Candidates were expected to correctly evaluate each program while providing an argument for each of their evaluation criteria. An argument could be made for each criteria in either a positive or negative light.

A common error was that no argument is provided other than only stating if the insurance plan addressed the criteria quoted in part a.

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 11	
TOTAL POINT VALUE: 3	**LEARNING OBJECTIVE(S): A2/B3**
SAMPLE ANSWERS	
Part a: 2.5 points	

Sample responses for action 1

- Appoint a regulator arms-length with the power to enact policies
- Change regulation to make clear and easy to understand. That will decrease the number of cases between of dispute over
- Fix structure flaw. Set up an arm-length regulator with skill-based board to regulate the insurance.

Sample responses for action 2

- Ensure better payment for the catastrophically impaired in court cases (lawyers are getting a large amount of payment)
- Provide care to catastrophic case. That's what they needed and not just cash.

Sample responses for action 3

- Change focus from cash to care for accident benefits payments (right now, focus is on volume of care, not quality of that care)
- Move from cash to are meaning increase the availability of re so that victims get appropriate medical care and focus on their well-being than cash compensation

Sample responses for action 4

- Make contingency fees more transparent and simplify benefits so there is less of a need for lawyers
- More transparency with contingent fee for lawyers. If system allows easy access to care, number of suits thus lawyers contingent fees will decrease

Sample responses for action 5

- Smart regulation – allow insurers to compete more freely on the basis of insurance premiums
- Allow insurers to offer new products or compete more freely on price and services i.e open system

Part b: 0.5 point

Sample 1

The system focuses on cash settlement instead of active medical care to help the injureds back to pre-accident life

Sample 2

The value gap is that no one actively monitors the access to medical care. If the care system is more elaborated, people will have easier access to care and that will decrease the cost paid to experts and lawyer and improve the structure of the insurance system in Ontario.

Sample 3

The value gap of medicare would be better if changing focus from maximizing cash payout to active medical management.

EXAMINER'S REPORT

Candidates were expected to describe the five-part action plan for improvements to the auto insurance system in Ontario and describe the value gap in the system as explained in the Marshall Report.

Part a

Candidates were expected to identify the five actions outlined in the Marshall Report and provide a brief explanation or example of what the action could be.

Common errors included:

- Not providing a full explanation of an action, for example, stating "fix structural flaw in system"
- Providing the current issues of the system instead of the providing the action plans proposed by Marshall which address these particular issues

Part b

Candidates were expected to address the issue that medical care for accident victims can be better managed and care for victims can be improved.

Common errors included:

- Not providing a complete answer and only alluding to improving care by stating there should be movement from cash settlement to care.
- Describing the opportunity gap which relates to Ontario automobile premiums instead of the value gap which relates to managing medical care.

QUESTION 12

TOTAL POINT VALUE: 2.25	**LEARNING OBJECTIVE(S): B1-B3**

SAMPLE ANSWERS

Part a: 1.25 point

Sample 1

Mortgage is not covered by PACICC

Recovery = 70% x min(1000, 1000 x 9/12) = 525

No loss amounts

Total recovery = 525

Sample 2

Only get recovery on Homeowner policy since PACICC only covers Homeowner and Automobile

Since no information on loss, assume a loss of 300000 for the Homeowner

Recovery = Unearned Premium + Outstanding Loss
= 70% x min(1000, 1000 x 9/12) + min(300000, 300000-1000)
= 525 + 299000 = 299525

Comment on answer

A loss amount of either zero or an assumed number was accepted given that the loss amount was not included in the question.

Part b: 0.5 point

Sample

The insured will receive no additional recovery as a result of liquidator of $50,000. Recoveries from liquidator are used to reduce future assessments for insurers under PACICC.

Comment on answer

Candidates' answer differed dependent on the assumption they made in part a. above for the missing loss amount.

Part c: 0.5 point

Sample Responses

- Through assessments from remaining solvent insurers
- Borrow money from Compensation fund (pre-insolvency funding)

EXAMINER'S REPORT

Candidates were expected to know the unearned premium calculation for PACICC payments and understand the recovery and funding process of the plan.

SAMPLE ANSWERS AND EXAMINER'S REPORT

Part a
Candidates were expected to know the recovery from PACICC in the event of insolvency. Candidate also need show the knowledge on the recovery of UPR. Common errors included: • Calculating the unearned premium for the Mortgage policy which is not covered by PACICC • Miscalculating the unearned portion of the premium • Forgetting elements in the formula
Part b
Candidates were expected to understand the recovery process of amounts paid by PACICC. PACICC recovers any amounts already paid before any additional payment is received by the policyholder for a claim. A common error included: • Calculating the amount paid by PACICC net of distribution from liquidator instead of explaining the additional recovery the insured would receive.
Part c
Candidates were expected to understand the funding mechanisms and sources of funding of PACICC. A common error included: • Including "government taxes" as a source of funding

QUESTION 13	
TOTAL POINT VALUE: 5.75	**LEARNING OBJECTIVE(S): C2**
SAMPLE ANSWERS	

Sample:

Time	Payment	PV@3%	PV@2.5%
.5	100000*1/3=33333.33	32844	32924
1.5	33333.33	31887	32121
2.5	33333.33	30959	31338
Total	**100000**	**95690**	**96383**

APV = 96383+95690*12%=107866
Mac Duration = (32844*.5+31887*1.5+30959*2.5)/95690 = 1.4803
Modified Duration = 1.4803/1.03 = 1.4372

Unpaid Claims Margin = 95690*10% = 9569
Premium Liabilities Margin = Max((150000-4500)*.3,78000)*15% = 11700

Assuming "Net premium liabilities duration" is the modified duration.
Interest Rate Risk Margin = 1.25%*|128000*3.1-(107866*1.4372+80000*1.8)| = 1222

Insurance Risk Margin = 9569+11700 = 21269
Market Risk Margin = 1222+400+11000=12622

Operational Risk Margin Cap = 30%*(21269+12622+3100)=11097.3

Operational Risk Margin =
150000*2.5%+4500*2.5%+(150000-100000*1.2)*2.5%+(21269+12622+3100)*8.5% = 7757
(less than cap)

I = 21269 A=12622+3100=15722
Div Credit = I+A-SQRT(I^2+A^2+2*.5*I*A) = 4836

Total Margin Required = 21269+15722+7757-4836 = 39912

MCT = 82000/(39912/1.5) = 308.2%

Alternate premium liabilities duration calculations

- Assuming the "Net premium liabilities duration is the Macauley duration
  Modified duration = Macauley duration / 1.03 = 1.80 / 1.03 = 1.748

EXAMINER'S REPORT
Using the information provided, candidates were expected to determine the total capital required to calculate the MCT ratio. Candidates were expected to calculate the margins required for unpaid claims, premium liabilities, and market risk. In addition, candidates were expected to calculate the capital required for operational risk and the diversification credit.

Common errors included:

- Calculation errors
- Using an incorrect payment pattern
- Miscalculating the claims development PfAD
    - Using a discount rate of 2.5%
    - Using an incorrect MfAD percentage
- Using an incorrect formula in calculating the discounted with PfAD amount
- Not using modified duration when calculating the duration
- In the interest risk formula
    - Using incorrect values
    - Not mentioning the absolute value component of the formula
- In the net premium liabilities margin calculation
    - Not excluding PfAD from the premium liabilities amount
    - Not considering the maximum between 30% of net written premiums and net premium liabilities
    - Using direct written premium instead of net written premiums in calculating the maximum
- Omitting components or calculation errors in the operational risk calculation
- Not dividing by 1.5 in final MCT calculation

QUESTION 14	
TOTAL POINT VALUE: 4.75	**LEARNING OBJECTIVE(S): C1-C2**
SAMPLE ANSWERS	
Part a: 2.5 points	
Sample 1 Adjusted net unearned premium = 55,000 – 4,000 = 51,000 Undiscounted losses and LAE = 51,000 x 80% = 40,800 PV(loss+LAE)@3% = 40,800 x (0.6 x $1.03^{-0.5}$ + 0.4 x $1.03^{-1.5}$) x $1.03^{(0.5-1/3)}$ = 39,694 PV(loss+LAE)@2.75% = 40,800 x (0.6 x $1.0275^{-0.5}$ + 0.4 x $1.0275^{-1.5}$) x $1.0275^{(0.5-1/3)}$ = 39,783 Claims PfAD = 39,694 x 6% = 2,382 Interest rate PfAD = 39,783 – 39,694 = 89 Reinsurance ceded PfAD = (51,900 – 39,694) x 0.5% = 61 APV = 39,694 + 2,382 + 89 + 61 = 42,226 Maintenance expenses = 65,000 x 28% x 25% = 4,550 Premium liabilities = APV + Maintenance expenses + Future reinsurance cost + Contingent commission = 42,226 + 4,550 + 4,000 + 2,000 = 52,776 *Sample 2* Undiscounted losses and LAE = (55,000 – 4,000) x 80% = 40,800 Discount factor @3% = (0.6 x $1.03^{-0.5}$ + 0.4 x $1.03^{-1.5}$) x $1.03^{(0.5-1/3)}$ = 0.9729 Discount factor @2.75% = (0.6 x $1.0275^{-0.5}$ + 0.4 x $1.0275^{-1.5}$) x $1.0275^{(0.5-1/3)}$ = 0.9751 APV = 40,800 x 0.9751 + 40,800 x 0.9729 x 0.06 + (51,900 – 40,800 x 0.9729) x 0.005 = 42,226 Premium liabilities = APV + Maintenance expenses + Future reinsurance cost + Contingent commission = 42,226 + 65,000 x 0.28 x 0.25 + 4,000 + 2,000 = 52,776	
Part b: 0.5 point	
Equity in UPR = Net UPR + Unearned commission –Premium liabilities = 55,000 + 2,700 – 52,776 = 4,924 Max DPAE = 4,924 Since initial DPAE (6,500) is greater than Max DPAE, the DPAE must be reduced.	
Part c: 0.75 point	
Sample 1 ROE = Net income / Equity	

When DPAE is reduced 2 things occur:

- Equity is reduced because DPAE is held as an asset.
  EQ = A – L. If Assets decrease, Equity decreases
  This makes ROE go up
- As DPAE goes down, expenses increase on the income statement which reduces net income
  This makes ROE go down

The overall effect is uncertain.

Sample 2

The reduction in DPAE means that more of the premium acquisition expense must be recognized in the period. Therefore NI goes down. DPAE is categorized as asset. Thus, reducing asset will reduce equity by a similar amount then the NI reduction. Net effect would be a decrease in ROE.

Part d: 0.5 point

Sample responses (any two of the following)

- Valuation of claims liabilities
- Business plan analysis
- Ratemaking analysis
- Ad hoc analysis
- Deterministic method
- Stochastic method
- Historical loss ratio
- Industry benchmark
- Expert judgement

Part e: 0.5 point

Sample 1

Margin for Premium liabilities = Max(Premium liabilities excluding PfAD, 30% x NWP) x 15%
= Max(52,776 – 2,382 – 89 – 61, 30% x 100,000) x 15%
= 7,537

Sample 2

Premium liabilities excl. PfAD = 39,694 + 4,550 + 4,000 + 2,000 = 50,244
30% x NWP = 30% x 100,000 = 30,000

Max(50,244, 30,000) x 15%
= 7,537

EXAMINER'S REPORT

Candidates were expected to demonstrate how to calculate premium liabilities, maximum DPAE, capital required for premium liabilities in the MCT calculation, and the impact of the DPAE on the ROE.

Part a

Candidates were expected to know the net premium liabilities calculation.

Common errors included:

- Not including all components (most commonly contingent commissions) in the final formula
- Not calculating maintenance expenses correctly
- Stopping the calculation at the APV point and not completing the final steps to derive the premium liabilities number

Part b

Candidates were expected to know how to calculate the maximum DPAE and the effect on initial DPAE.

Common errors included:

- Using the wrong unearned commission amount
- Not mentioning the right action to take based on the maximum DPAE calculation

Part c

Candidates were expected to understand how a change in DPAE can affect net income, equity, and ROE.

Common errors included:

- Stating that a decrease in equity will result in a decrease of ROE
- Assuming there is no impact on net income
- Failing to explain how a change in DPAE impacts equity or net income

Part d

Candidates were expected to identify two different methods for evaluating loss ratios underlying the premium liabilities.

Common errors included:

- Stating two methods that were very similar
- Commenting on the nature of data used for evaluating loss ratios and not listing methods

Part e

Candidates were expected to calculate the margin for premium liabilities used for the MCT calculation.

Common errors included:

- Not excluding PfADs from the premium liabilities
- Not including contingent commissions, future reinsurance premium, and maintenance expenses in premium liabilities
- Not applying the maximum correctly
- Omitting the 30% x NWP calculation

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 15	
TOTAL POINT VALUE: 2.5	**LEARNING OBJECTIVE(S): C1**

SAMPLE ANSWERS

Part a: 0.75 point

Sample

APV unpaid claims for AY 2015 at 36 months : 17,250 – (8,500 + 2,000 + 500) = 6,250
APV unpaid claims for AY 2015 at 48 months : 17,250 – (8,500 + 2,000 + 500 + 250) = 6,000

Investment income = (6,250 + 6,000)*0.025/2 = 153.125

Part b: 1.25 points

Sample 1

APV unpaid claims for AY 2016 at 12 months : 14,200 – 8,000 = 6,200
APV unpaid claims for AY 2016 at 24 months : 15,500 – (8,000 + 1,500) = 6,000
APV unpaid claims for AY 2016 at 36 months : 16,000 – (8,000 + 1,500 + 1,000) = 5,500

Investment income = (6,200 + 6,000)*0.025/2 + (6,000 + 5,500)*0.025/2 = 296.25

Excess/(Deficiency ratio) = (unpaid claims@begin – unpaid claims@end – cumulative paid + investment income)/unpaid claims@begin
= (6,200 – 5,500 – (1,500 + 1,000) + 296.25)/6200 = -24.25%

Sample 2 (calculation of ratio)

Excess/(Deficiency ratio) = (APV@begin – APV@end + investment income)/unpaid claims@begin
= (14,200 – 16,000 + 296.25)/6200 = -24.25%

Part c: 0.5 point

Sample 1

The excess/deficiency ratios are always negative. The company doesn't have sufficient reserves to cover unpaid claims. OSFI may intervene.

Sample 2

OSFI would be alarmed by the fact that the company seems to understate its initial unpaid amounts every year. OSFI may suggest strongly that the company re-evaluate their methods.

EXAMINER'S REPORT

Candidates were expected to be able to calculate the discounted excess/(deficiency) of unpaid claims as well as comment on the meaning of the excess/(deficiency) ratio calculated.

Part a

Candidates were expected to be able to calculate investment income.

Common errors included:

- Using APV ultimate instead of APV unpaid claims
- Using incremental paid instead of cumulative paid when calculating unpaid claims

<table>
<tr><td>

Calculating the investment income for all of AY 2015 instead of just that for CY 2018
Not calculating the investment income for the right time period

</td></tr>
<tr><td>Part b</td></tr>
<tr><td>
Candidates were expected to be able to calculate the ratio using change in discounted ultimate plus investment income, divided by discounted reserves.

Common errors included:

Calculating the investment income incorrectly
Pulling incorrect figures from the triangles to enter into the equation
Dividing by the initial discounted ultimates instead of unpaid claims
Using incremental paid instead of cumulative when calculating unpaid claims
Not calculating the ratio for the right time period

</td></tr>
<tr><td>Part c</td></tr>
<tr><td>
Candidates were expected to analyze the excess/(deficiency) ratio calculated from OSFI's perspective.

Common errors included:

Not mentioning reserve/ultimate deficiency across all AYs and CYs
Not mentioning that OSFI could be concerned with the solvency of the company

</td></tr>
</table>

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 16	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): C1**

SAMPLE ANSWERS

Part a: 0.5 point

Sample

- Asset for future income taxes is the prepayment of taxes as a result of the liabilities deducted for tax purposes being less than the amount reported on Balance Sheet
- Asset arise when prepaid tax for claim liability that is less than booked value
- An asset represents prepayment of tax arising from the tax credit taken for loss < Balance Sheet Loss

Part b: 1 point

Sample:

PV factor = (31600+150) / (34500) = 0.9203
APV = 31600 + 4100 + 220 + 150 = 36070
[37000 – 0.95 x min(37000, 36070)] x 0.35 x (1-0.9203) = 76.25

EXAMINER'S REPORT

Candidates were expected to understand the impact of taxes on the financial statement pertaining to claims liabilities.

Part a

Candidates were expected to demonstrate an understanding of the temporary future tax difference that arises from the difference in the insurer's claim liabilities and the claim liabilities recorded in the annual statement.

Common errors included:

- Not pointing out that it is a temporary tax difference
- Omitting to specify that the asset represents a prepayment of tax
- Not mentioning that the asset arises when comparing the claims liabilities calculated by actuary to the provision booked in the financial statement

Part b

Candidates were expected to calculate the impact of discounting the asset for future income taxes.

Common errors included:

- Not calculating the present value factor correctly
- Not including PfADs in the claim liabilities calculation
- Not applying the present value factor properly

QUESTION 17	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): C1**
SAMPLE ANSWERS	

Sample 1

Future cost by year:

2019	2020	2021
2,500,000	1,500,000	1,000,000

Duration: 0.5 1.5 2.5

$$PV = \frac{2.5M}{1.02^{0.5}} + \frac{1.5M}{1.02^{1.5}} + \frac{1M}{1.02^{2.5}} = 4,883,167$$

Remainder of undiscounted:

	2019	2020	2021
	5,000,000	2,500,000	1,000,000
Duration	1	2	3
Cost of Capital	10%		
Margin	15%		
Target	3		
	225,000	112,500	45,000

$$PV = \frac{225,000}{1.02} + \frac{112,500}{1.02^2} + \frac{45,000}{1.02^3} = 371,124.23$$

Total value of commuted claims: 4,883,167 + 371,124 = 5,254,291

Sample 2

	1	2	3
5,000,000	2,500,000	1,500,000	1,000,000

PV = 4,883,167

5,000,000	2,500,000	1,000,000
x 0.1 x 3 x .15		
= 225,000	= 112,500	= 45,000

PV = 371,124

Total commuted value = 5,254,291

Sample 3

Commuted value of capital =

$$5{,}000{,}000\left(\frac{0.5}{1.02^{0.5}}+\frac{0.3}{1.02^{1.5}}+\frac{0.2}{1.02^{2.5}}\right)+5{,}000{,}000*10\%*15\%*3*\left(\frac{1}{1.02^{1}}+\frac{0.5}{1.02^{2}}+\frac{0.2}{1.02^{3}}\right)$$

= 4,883,167.09 + 371,124.23 = 5,254,291.32

EXAMINER'S REPORT

Candidates were expected to use the information given to calculate the commuted value of claims.

Common errors included:

- Calculation errors
- Using the wrong discount rate to calculate the present value
- Not calculating the payment patterns correctly
- Using the wrong capital duration for the calculation of the risk margin

QUESTION 18	
TOTAL POINT VALUE: 4.75	**LEARNING OBJECTIVE(S): C1, C2**
SAMPLE ANSWERS	
Part a: 2.25 points	
Sample Countrywide PML500 = (90,000^1.5 + 350,000^1.5)^(1/1.5) = 379,800 East Canada PML 420 = 0.68*90,000 + 0.32*25,000 = 69,200 West Canada PML 420 = 0.68*350,000 + 0.32*130,000 = 279,600 Reserving PML = (2022-2018)/(2022-2014)*max(279,600, 69,200) + (2018-2014)/(2022-2014)*379,800 = 329,700 Reinsurance coverage =0*25,000 + 0.9*75,000 + 1.0*100,000 + 0.5*50,000 = 192,500 10% Capital and Surplus = 0.10*(60,000 + 155,000 + 45,000) = 26,000 ERC = Reserving PML – Financial Resources = 329,700 – (192,500 + 10,000 + 26,000) = 101,200 Earthquake Reserve = 1.25 * (ERC + EPR) = 1.25 * (101,200 + 10,000) = 139,000	
Part b: 1 point	
Sample 1 • This will decrease the capital required for insurance risk • If dealing with unregistered reinsurers, it may decrease credit risk • Since both insurance risk and credit risk decrease, operational risk will decrease • Capital available will stay the same unless the decrease is caused by a decrease in EPR *Sample 2* • Equity stays the same & capital available stays the same • Required capital for catastrophe reduces (insurance risk) • Operational capital reduces • Diversification credit reduces, but less than insurance + operational *Sample 3* • Insurance risk down because cat margin down • Market risk stable • Credit risk stable (if no cession to unregistered) • Capital available stable	
Part c: 0.5 point	
Sample: • Surplus is reduced by PML (1 in 100 years) *Sample 2* • Surplus is reduced by the net PML after tax, adjusted for any catastrophe after first event. *Sample 3* • Property earthquake exposure increase causes PML and earthquake reserve increase. Surplus will decrease.	

Part d: 1 point

Sample answers (maximum one answer from four of the following categories)

- Data quality and governance (one of the following)
  - Accurate property value and insurance to value, accurate property location and coding
  - Implement safeguards to prevent manipulation
  - On-site review to ensure data is up to date
  - Be comfortable and check integrity, validation & limits of data used
  - Improve the quality of data and get data audited
  - Invest in data quality
  - Invest in technology to improve data quality
- Risk management (one of the following)
  - Board should review earthquake policies
  - Oversight of risk management by senior management
  - Experience risk management leadership
  - Have sound Eq risk management program, subject to oversight by the board
  - Establish a clear risk appetite/risk Limit (limit exposures)
- Exposure monitoring (one of the following)
  - Monitor, measure exposure
  - Aggregate exposure monitoring
  - Monitor aggregate loss exposure
  - Monitor & limit geographic concentration
  - Use aggregate loss exposure as a secondary test of the model
- Models/modeling (one of the following)
  - Have in-house or purchase cat model
  - Parameter selection
  - Understand the assumptions used and methodology of EQ model
  - Run/use more than one model
  - Ensure knowledge of assumptions, methods, limitation, of models
- Have qualified staff running the model (internal or external)
- PML (one of the following)
  - Make sure you're comfortable with the PML (data quality, non-modeled exposures, model risk, multi-region)
  - Compare PML with previous estimate
  - Explain PML variations
- Financial resources and contingency plan (one of the following)
  - Ensure financial flexibility
  - Quality financial resources
  - Capital strength of parent company
- "What-if" testing

SAMPLE ANSWERS AND EXAMINER'S REPORT

EXAMINER'S REPORT
Candidates were expected to be able to calculate the reserving PML as an interpolation between the PML 420 (East or West) and the PML 500 Countrywide. Then, using the reserving PML, they were required to calculate any margin required for catastrophes. Candidates were also expected to understand the impact of the earthquake reserve on the MCT and on the BCAR test.
Part a
Candidates were expected to be able to calculate the reserving PML as an interpolation between the PML 420 (East or West) and the PML 500 Countrywide. Then, using the reserving PML, they were required to calculate any margins required for catastrophes. A common error included: • Not removing the EPR as part of financial resources when calculating the ERC. This resulted in EPR being added to the Earthquake Reserve when it should not.
Part b
Candidates were expected to understand the impact of the earthquake reserve on the MCT. A common error included: • Indicating that the operational risk might or might not change and that the change would depend on whether the risk margin is limited by the 30% cap. This is an inaccurate statement as the cap depends on the sum of insurance risk, credit risk and market risk. If those three values collectively decrease, the cap will decrease. Therefore, if insurance risk decreases, operational risk will decrease, everything else being equal.
Part c
Candidates were expected to understand the impact of the earthquake reserve on the BCAR test. A common error included: • Not indicating that the surplus would decrease. • Not able to quantify how the surplus would decrease.
Part d
Candidates were expected to identify four qualitative risk management practices that would improve the A.M. Best rating with respect to the catastrophe analysis. Common errors included: • Repeating the same argument using different wording • Not providing four qualitative risk management practice

QUESTION 19	
TOTAL POINT VALUE: 2.5 points	**LEARNING OBJECTIVE(S): C2**
SAMPLE ANSWERS	
Part a: 0.5 point	
Two of the following • A realistic set of assumptions used to forecast insurer's financial condition during forecast period. • Usually consistent with business plan unless it is unrealistic. • Throughout the forecast period, the base scenario is required to have MCT > 150%. • Throughout the forecast period, assets are greater than liabilities.	
Part b: 0.5 point	
Sample • Under the base scenario, MCT is greater than 150% throughout the forecast period. • For all base and adverse scenarios throughout the forecast period, assets must be greater than liabilities. However, under unpaid claims adverse scenario, liabilities are greater than assets in 2020, so the company is not in a satisfactory financial condition.	
Part c: 0.5 point	
Two of the following • Implement rate increase where possible • Review target mix of business • Sell and reinvest assets • Review reserving and claims handling guidelines • Review reinsurance coverage • Review investment strategy • Settling claims faster	
Part d: 0.5 point	
Two of the following • Loss of reinsurance coverage for the remainder of the term • Forced sale or liquidation of assets • Deterioration of loss ratio • Increase in combined ratio • Deterioration of ROE • Rating agency downgrade • Increase in policy liabilities related to current reinsurance contract • Post event inflation • Insolvency of one or more reinsurers • Increase in reinsurance rates • Increased PACICC assessments	
Part e: 0.5 point	
Sample	

If the event has a material impact on the company and invalidates the report, the actuary should amend the report and disclose it. However, if the event is not material, should only disclose.

EXAMINER'S REPORT

Candidates were expected to understand the details of Dynamic Capital Adequacy Testing.

Part a

Candidates were expected to describe the base scenario in the context of the DCAT. At least two key elements were expected.

A common error was listing only one item out of two.

Part b

Candidates were expected to assess whether the company was in a satisfactory financial condition.

Common errors included:

- Stating that the company needed to have a positive MCT ratio to have a satisfactory financial condition

Part c

Candidates were expected to identify two management actions that the actuary may consider under the misestimation of policy liabilities.

Common errors included:

- Providing management actions not related to the misestimation of policy liabilities scenario
- Providing only one answer
- Providing ripple effects instead of management actions

Part d

Candidates were expected to identify two ripple effects that the actuary may consider under the frequency/severity (loss ratio).

Common errors included:

- Providing ripple effects not related to the frequency/severity (loss ratio) scenario
- Providing only one answer
- Providing management actions instead of ripple effects

Part e

Candidates were expected to describe the actions that the actuary needs to take when a catastrophic event occurs after the report is completed, but before the presentation to the Board is made.

Common errors included:

- Identifying this event as a subsequent event, which was not the case as the catastrophe occurred after the report date. Assuming that a catastrophic event would automatically invalidate the report. This is not necessarily the case if the event is not material to the company.

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 20	
TOTAL POINT VALUE: 3	**LEARNING OBJECTIVE(S): C1**

SAMPLE ANSWERS

Sample 1

- The calculation formula for equity in unearned premium is wrong. It should be Net Unearned Premium – Net Policy Liability + Unearned Commissions + Premium Deficiency
- When the equity in unearned premium is lower than the DPAE, the AA should reduce the DPAE to the equity in unearned premium, not book it as a premium deficiency. Premium deficiency is only booked when the equity in unearned premium is negative.
- The AA should reflect the court decision in her work instead of only describing it because the court decision occurred before the calculation date and was material.
- Discounting periods for premium liabilities should not be the same as claim liabilities. The AA should adjust the discounting period to account for the average accident date of the UPR.

Sample 2

- As there was a rate decrease recently for all lines of business, the AA should adjust all expected loss ratios to the future period, not leaving some at the historical observed levels.
- The AA included deferred tax assets in her analysis of premium liabilities. These should not be included in a premium liability analysis so she should exclude them.
- The AA considered only senior management and directors when determining materiality of the calculation error. All users of the report should be considered when determining materiality.
- The formula of equity in unearned premium is incorrect. It should be MAX(0, Net Unearned Premium – Net Policy Liability + Unearned Commissions)

EXAMINER'S REPORT

Candidates were expected to know the CIA standards of practice and educational guidance regarding premium liabilities valuation.

Common errors included:

- Stating that the actuary's work must be adjusted for the calculation error even though it was not material.
- Stating that MfADs must be the same for premium liabilities and claim liabilities.

QUESTION 21	
TOTAL POINT VALUE: 3.5	**LEARNING OBJECTIVE(S): C2**
SAMPLE ANSWERS	
Part a: 1.75 points	

Sample 1

i.

$$\text{Yield} = \frac{2 * \text{Net ii}}{V_b + V_e - \text{Net ii}}$$

$$V_b = 8{,}000 + 50{,}000 + 2{,}500 + 20{,}000 = 80{,}500$$

$$V_e = 10{,}000 + 45{,}000 + 3{,}000 + 15{,}000 = 73{,}000$$

$$\text{Net}_{ii} = 7{,}500 - 1000 - 800 = 5{,}700$$

$$\text{Yield} = \frac{2 * 5{,}700}{80{,}500 + 73{,}000 - 5{,}700} = 7.71\%$$

ii.

$$\text{ROE} = \frac{\text{NI after tax}}{\text{Equity}}$$

$$\text{NI} = \text{NEP} - \text{Net clms} + \text{Net ii} - \text{expenses} - \text{taxes}$$

$$\text{NEP} = 45{,}000 - (-1500) = 46{,}500$$

$$\text{NI} = 46{,}500 - 40{,}000 - 7500 - 3500 + 5700 - 1000 = 200$$

$$\text{ROE} = \frac{200}{40{,}000} = 0.5\%$$

iii.

$$\text{ROA} = \frac{\text{NI after tax}}{\text{2 yrs avg assets}} = \frac{200}{0.5 * (120{,}000 + 112{,}500)} = 0.172\%$$

iv.

$$\text{Net UW lev ratio} = \frac{\text{NWP}}{\text{Equity}} = \frac{45{,}000}{40{,}000} = 112.5\%$$

Sample 2 (for ii. only)

ii.

$$\text{ROE} = \frac{\text{NI}}{\text{Avg Equity}}$$

$\text{NI} = 45{,}000 + 1{,}500 - 40{,}000 - 7{,}500 - 3{,}500 + 7{,}500 - 1000 - 800 - 1000 = 200$ $\text{ROE} = \dfrac{200}{(37{,}500 + 40{,}000)/2} = 0.52\%$
Part b: 1 point
Sample 1 • Yield = 7.71 = Good • ROE = 0.5% < 5.4% Bad • ROA = 0.172% <2.6% Bad Overall, poor financial condition since despite the high investment yield, ROE and ROA are really low. *Sample 2* • Net underwriting leverage ratio = 112.5%, which is below 300%, so favorable. • ROE is equal to 0.5%, which is below 5.4%, so unfavorable. • ROA is equal to 0.172%, which is below 2.6%, so unfavorable. Overall, the financial health of the company is not so good because ROE and ROA. Underwriting income was too low.
Part c: 0.75 point
Sample 1 $\text{Net lev ratio} = \dfrac{\text{NWP} + \text{Net liab}}{\text{Eq}} = 250\%$ $\dfrac{\text{Net liab}}{\text{Equity}} = \text{Overall net lev ratio} - \text{Net UW lev ratio} = 2.5 - 1.125 = 1.375$ $\text{Net liab} = \text{EQ} * 1.325 = 40{,}000 * 1.375 = 55{,}000$ $\text{Tot liab} = \text{Assets} - \text{EQ} = 120{,}000 - 40{,}000 = 80{,}000$ $\text{Tot liab} = \text{Gross UCAE} + \text{Gross UEP}$ $80{,}000 = 45{,}000 + \text{Gross UEP}$ $\text{Gross UEP} = 35{,}000$ $\text{Net liab} = \text{Net UCAE} + \text{Net UEP}$ $55{,}000 = (45{,}000 - \text{UCAE REC}) + (35{,}000 - 11{,}500)$ $\text{UCAE REC} = 13500$ *Sample 2* $\text{Total liabilities} = 120{,}000 - 40{,}000 = 80{,}000$

$$\text{Net leverage ratio} = \frac{\text{Net written premiums} + \text{Net liabilities}}{\text{Equity}} = \frac{45{,}000 + x}{40{,}000} = 250\%$$

$x = 55{,}000$

$$\text{Net liabilities} = \text{Total liabilities} - \text{unearned premiums recoverables} - \text{unpaid claim and adjustment expenses recoverables}$$

$55{,}000 = 80{,}000 - 11{,}500 - x$

$x = 13{,}500$

EXAMINER'S REPORT

Candidates were expected to know how to calculate and use financial ratios to assess the financial health of an insurance company.

Part a

Candidates were expected to:

- Accurately calculate various financial ratios
- Use the appropriate components from the statement of financial position and statement of income in the calculation of the financial ratios

A common error included incorrectly defining the ratios.

Part b

Candidates were expected to know how to interpret the ratios calculated in part a. above.

Common errors included:

- Using an incorrect threshold to assess the financial health
- Answering Yes or No when the question asks for an assessment with supporting comments

Part c

Candidates were expected to know how to use information provided in the question and calculated in part a. to determine the unpaid claims and adjustment expenses recoverable.

A common error included not incorporating Net Leverage Ratio in determining the answer.

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 22	
TOTAL POINT VALUE: 1.75	**LEARNING OBJECTIVE(S): C2**

SAMPLE ANSWERS

Part a: 0.75 point

Sample answers for reason #1

- Agents are wary about unrated insurer.
- Agents may hesitate to place policies with the unrated insurers since they might be financially distressed.
- Agents might be sued for providing insurance from a financially weak insurer.

Sample answers for reason #2

- Third party and customers rely on outside assessments of insurer solvency.
- Primary insurers use ratings to evaluate the ability of reinsurers to pay obligations years in the future.
- Investors use ratings to select companies to invest in.
- Solvency assessment: ratings used by regulators and agents to determine ability to pay claims.

Sample answers for reason #3

- Rating agencies are efficient at assessing financial strength.
- It is less expensive to pay for a rating than to demonstrate financial strength individually to various stakeholders.

Part b: 1 point

Any two of the following:

- Reinsurance: An insurer may be required to have reinsurance with a reinsurer of a high rating. This help to ensure the financial strength of the reinsurer.
- Low frequency/High severity type of insurance like surety: These types of lines are particularly difficult to insure because of their nature (harder to risk analyze & manage than high freq/low severity). A high rating may be required to demonstrate an insurer's ability to pay out.
- Homeowners insurance: Bank often required mortgage insurance from a highly rated insurance.
- Structured settlements: Court might require structured settlements issued from at least A level line insurance company to ensure that the claimant will receive the prescribed payments. It's a long-tail business for the insurer, so the rating is particularly important.
- Commercial liability because cash flow will continue a long time in the future. Company want to be sure insurer will be able to pay claims.
- Flood insurance: losses are concentrated, affecting large numbers of insured at once. Thus requiring high ratings to avoid insolvency.

Additional answers included other lines of business or types of insurance that were long tail line or low frequency/high severity, if a proper explanation was provided.

EXAMINER'S REPORT

Candidates were expected to demonstrate the importance of obtaining a financial strength rating from a credit agency.
Part a

Candidates were expected to demonstrate an understanding of the general benefits of obtaining an independent credit rating.
 	
Common errors included:
• Repeating the same argument in different words
• Not providing the correct reason
• Not describing the reason correctly, for example:
  ○ "Third party requiring assessment" was not sufficient; candidates needed to mention the solvency assessment as well
  ○ Saying that "the management of the company does not have the expertise" is not correct as management should have the expertise, just not the resources required for a thorough review

Part b

Candidates were expected to describe lines of business or types of insurance where high financial ratings are important.
 	
Common errors included:
• Not providing a line of business where a high rating is important (example: short tail line or high frequency/low severity)
• Repeating the same type of insurance in different words
• Not providing the correct justification
• Not providing a detailed justification, for example, answering "inherent risk" is not sufficient as the answer should relate to one of the following types risks:
  ○ Long tail lines: ability to pay when claims are due
  ○ High claims severity
  ○ Catastrophic events

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 23	
TOTAL POINT VALUE: 2.5	**LEARNING OBJECTIVE(S): C1**
SAMPLE ANSWERS	
Part a: 0.5 point	
<u>*Sample 1*</u> An omission/over-statement or understatement will materially affect user's decision making or expectations <u>Sample 2</u> When understatement/overstatement/omission materially impacts user's decision <u>Sample 3</u> Materiality is an omission, understatement, overstatement that will impact the course of action of the user either changing a conclusion or reviewing a method	
Part b: 1 point	
<u>*Sample 1*</u> • Financial strength • Size of insurer • Type of business • Net retention <u>*Sample 2*</u> • Ease of access to capital • Type of business • Stage of organizational life cycle • Have multiple reinsurance	
Part c: 0.5 point	
<u>*Sample 1*</u> • Complexity of the concept • Sophistication of the user <u>*Sample 2*</u> • Need to consider the significance to the user • Need to consider the complexity of the subject to the user	
Part d: 0.5 point	
<u>*Sample 1*</u> Materiality level for DCAT work is less rigorous than material level for valuation work, since valuation work is related to financial statements. DCAT materiality level for DCAT is used in scenario testing. <u>*Sample 2*</u>	

DCAT's materiality level can be higher because all of the values in the DCAT are projections or assumptions which will not flow through into the actual financial results, but the valuation results are reported and reflected in the financials so they need to be more precise.

EXAMINER'S REPORT

Candidates were expected to understand the concept of materiality and know the considerations with respect to the disclosure of materiality.

Part a

Candidates were expected to know about the concept of materiality

Common errors included:

- Not providing an answer in enough detail, such as "concept of materiality is that of which would impact decision making".

Part b

Candidates were expected to know characteristics of an insurance company that may affect the materiality level.

One common error included:

- Listing fewer items than the four required

Part c

Candidates were expected to identify considerations regarding the disclosure of the materiality level.

A common error included:

- Listing considerations for determining whether something was material rather than listing considerations specific to the disclosure of the materiality standard. Examples included: "purpose of the work and use" and "user's intention of the work".

Part d

Candidates were expected to contrast how the materiality standards varied for valuation compared to DCAT work.

Common errors included:

- Incorrectly stating that the DCAT materiality standard was more rigorous than the valuation materiality standard.
- Correctly stating that the materiality standard was more rigorous for valuation, but then not providing any support to describe the difference between DCAT and valuation work, such as "Materiality for DCAT is less rigorous than for valuation work".

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 24	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): C1**
SAMPLE ANSWERS	
Part a: 1 point	
Claims: 2.5% to 20% Could be higher if stochastic analysis reflects volatility not identified using analysis approach. Inv. Rate: 25bp to 200bp Could be lower if the discount rate is already lower than 25bp.	
Part b: 1 point	
Sample 1 • Should be lower with emerging information • Should be higher if LOB is low freq. / high sev. • Should be higher if probability distribution is wide • Should be higher if it is a long tail line *Sample 2* • Less information on estimate → margin higher • Long tail line → margin higher • Longer contract term → margin higher • Wide loss distribution → margin higher	
EXAMINER'S REPORT	
Candidates were expected to understand the use and characteristics of margins for adverse deviation as established by the CIA Standards of Practice.	
Part a	
Candidates were expected to know the margin ranges and understand situations in which deviation from these ranges might be allowed. A common error included: • Providing the incorrect margin ranges	
Part b	
Candidates were expected to know the desirable characteristics of risk margins. A common error included: • Listing characteristics for the risk margin methodology instead of desirable risk margin characteristics	

QUESTION 25	
TOTAL POINT VALUE: 3.75	**LEARNING OBJECTIVE(S): D1**
SAMPLE ANSWERS	
Part a: 1 point	

<u>*Sample 1*</u>

1. Ensure AA has done work following AAP
2. Review appropriateness of assumption and methodology in AA's work
3. Consider material internal and external changes
4. Provide feedback on AA's work and document the process such that it helps OSFI evaluate the safety and soundness of the insurer.

<u>*Sample2*</u>

1. Assist OSFI in assessing the insurer's safety and financial soundness
2. Assist AA by providing independent advice
3. Assist AA by providing additional source of professional development
4. Create confidence in AA's work to public, senior management, and regulators

<u>*Sample 3*</u>

1. Need to have exposure to 2 or more different (unrelated) insurers
2. Need to have same qualifications as the AA (FCIA, Canadian experience, no adverse findings from CIA tribunal)
3. Cannot have a direct financial interest in the company that he reviews
4. Cannot have worked for the insurer in the last 3 years

Part b: 0.5 point

<u>*Sample 1*</u>

Peer review of the valuation of liabilities and DCAT is required every 3 years. The peer reviewer must be changed after 2 cycles i.e. after 6 years. An actuary from the same firm as a previous peer reviewer can perform the peer review. A previous peer reviewer may again become a peer reviewer after 1 cycle has passed since he/she was first peer reviewer.

<u>*Sample 2*</u>

External reviewer required to review each of methodologies and assumptions used by AA in detail every 3 years. If there is no material change to the methodologies and assumptions, external reviewer only needs to review the reasonableness annually. The same external reviewer cannot review the same work more than 2 cycles i.e. new external reviewer every 6 years.

<u>*Sample 3*</u>

If there are material changes – annually

If no material changes – review once every 3 years, all at once or in phases with disclosure there has been no material changes

Part c: 1 point

<u>*Sample 1*</u>

SAMPLE ANSWERS AND EXAMINER'S REPORT

1. Peer reviewer looks at AA's work in the F/S (valuation of liabilities) at a more granular level. External auditor makes sure F/S are free from misstatements as a whole
2. Peer reviewer uses CIA standards of practice/guidelines. Auditor uses CICA standards of practice/guidelines

Sample 2

1. Peer reviewers do not do any recalculations but auditors do
2. Peer reviewers do not verify data or controls but auditors do

Sample 3

1. Reviewer provides professional development education to AA while auditor does not
2. Auditor performs recalculations while reviewer does not

Part d: 1.25 points

Sample

- A: eligible, because she left the company more than 3 years ago, and she sold all the financial interest (direct) that she had in the company.
- B: not eligible, must have experience with at least 2 other related companies (here just 1, with DEF)
- C: eligible, no direct financial interest in the company, only indirect
- D: eligible, can be from same consulting firm doing the audit, just if FCIA D is not involved in audit work
- D [alternative answer]: yes but it is discouraged to have the peer reviewer from the same firm as auditor
- E: eligible, can be from same consulting firm doing financial statement, just if FCIA E is not involved in F/S work

EXAMINER'S REPORT

Candidates were expected to know the responsibilities/objectives of the external peer reviewer and the eligibility criteria of selecting a peer reviewer.

Part a

Candidates were expected to demonstrate knowledge of either the expected duties of the peer reviewer, OSFI's objectives with regards to the peer reviewer, or the eligibility criteria.

Common mistakes included:

- Incomplete answers with respect to qualifications of a peer reviewer.
- Repeating answers in different words

Part b

Candidates were expected to know the peer review cycle (OSFI AA section 3.g).

A common error included:

- Not being specific enough in the response, for example, simply stating "once every 3 years"

Part c
Candidates were expected to compare and contrast two differences between the roles and/or responsibilities of the external peer reviewer and the external auditor. Common errors included: • Listing responsibilities without comparing and contrasting • Not being specific/thorough enough in the response, for example, stating "peer reviewer's work is more granular than external auditor"
Part d
Candidates were expected to analyze the information provided and explain whether the listed FCIA is eligible to be peer reviewer. Common errors included: • Providing the correct answer but giving an incorrect or irrelevant rationale, for example "FCIA D is eligible because being in audit firm is OK" • Assuming that the colleague of FCIA E is the AA • Answering yes/no without an explanation

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 26	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): D1**

SAMPLE ANSWERS

Part a: 0.5 point

Sample answers for sub-part i. (one definition required)
Model:

- A practical representation of relationships among entities or events using financial, economical, mathematical and statistical concepts
- A simplification of reality using financial, economical, mathematical and statistical concepts

Sample answers for sub-part ii. (one definition required)
Model risk:

- Risk that due to limitations or flaws in model or in its use, a user draws an inappropriate conclusion from model results
- Risk of drawing incorrect conclusion due to limitations or flaw of the underlying model

Part b: 1.5 point

Sample answers for sub-part i. (any three of the following)
Severity:

- Financial significance of item
- Importance of model to the company
- Frequency of use of the model
- Reputation risks

Sample answers for sub-part ii (any three of the following)
Likelihood:

- Complexity of model
- Proper documentation on how to use the model
- Testing of the model
- If there are qualified staff using the model

EXAMINER'S REPORT

Candidates were expected to provide a definition of model and model risk and evaluate model risk exposure.

Part a

Candidates were expected to define a model in terms of the relationship between events or entities.

Common errors for sub-part i. included:

- Describing the relationship as being between the different concepts (statistical, etc.) instead of between the events or entities

Common errors for sub-part ii. included:

• Not stating that the model risk can lead to incorrect conclusions due to the model's limitations • Not specifying that the inaccurate conclusion is due to the flaw/limitation of the model or that the model might not operate as intended
Part b
Candidates were expected to be able to evaluate model risk exposure. A common error included: • Mixing up considerations between severity of model failure and likelihood of model failure