Exam 6C

Exam 6-Canada

Regulation and Financial Reporting
(Nation Specific)

INSTRUCTIONS TO CANDIDATES

1.   This 70.25 point examination consists of 31 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 <u>dark</u> 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 <u>not</u> 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. <u>Write only on the front lined side of the paper</u> – **DO NOT WRITE ON THE BACK OF THE PAPER**. Be careful to give the number of the question you are answering on each sheet. If your response cannot be confined to one page, please use additional sheets of paper as necessary. Clearly mark the question number on each page of the response in addition to using a label such as "Page 1 of 2" on the first sheet of paper and then "Page 2 of 2" on the second sheet of paper.

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

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

CONTINUE TO NEXT PAGE OF INSTRUCTIONS
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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 November 12, 2019.

END OF INSTRUCTIONS

1. (2 points)

    a. (0.75 point)

        Briefly describe three reasons the insurance industry was singled out for specific solvency legislation in the 1870's.

    b. (0.25 point)

        Briefly describe a reason guidelines are often favoured over legislation as a form of insurance regulation.

    c. (1 point)

        Briefly describe four key principles the Office of the Superintendent of Financial Institutions (OSFI) uses in its risk assessment of insurance companies.

2. (1.5 points)

    a. (0.75 point)

    State the decision made by the Privy Council in *Citizens Insurance Co. v. Parsons* and describe the rationale behind this decision.

    b. (0.75 point)

    Identify three implications of the Privy Council's decision in *The Attorney-General for Canada v. The Attorney-General for Alberta*.

3. (2 points)

    a. (0.5 point)

        Describe the current mandatory Ontario automobile injury compensation system.

    b. (0.75 point)

        According to the Marshall report, explain how the Ontario automobile injury compensation system is flawed.

    c. (0.75 point)

        According to the Marshall report, briefly describe three actions the government can take to improve the system.

4. (1.75 points)

In EY's 2017 report, *ICBC Affordable and Effective Auto Insurance*, there are multiple issues identified describing the frequency and severity of automobile insurance claims covered by the Insurance Corporation of British Columbia (ICBC).

a. (0.5 point)

Identify and briefly describe ICBC's insurance model.

b. (0.5 point)

Briefly describe two ways in which the model contributed to affordability issues related to increasing premiums over time.

c. (0.75 point)

Identify and describe an alternative to ICBC's insurance model described in part a. above.

5. (1.5 points)

    a. (0.5 point)

    Identify two main uses of credit scores in the personal property insurance industry.

    b. (1 point)

    Briefly describe two arguments supporting and two arguments against the use of credit score by an insurer.

6. (2 points)

The case *Fletcher v. Manitoba Public Insurance Corp.* reached the Supreme Court of Canada.

   a. (1.5 points)

   Identify three criteria for establishing a duty of care and briefly describe how each may be applied to this case.

   b. (0.5 point)

   Contrast the duty of care of private agents and brokers compared to employees of public insurers based on this case.

7. (1.75 points)

As a result of the 1978 trilogy of Supreme Court of Canada decisions, an upper limit was established on awards for non-pecuniary general damages.

a. (0.25 point)

Define non-pecuniary general damages.

b. (1 point)

Identify four arguments for a cap on non-pecuniary general damages.

c. (0.5 point)

Identify two exceptions for which the cap on non-pecuniary general damages does not apply in Canada.

8. (1.25 points)

    In the article *Tort Reform Tension*, Harris described several areas of tort reform aimed at controlling legal claim costs in Canada.

    a. (0.25 point)

        Briefly describe one reason trial lawyers have been resistant to joint and several liability tort reform measures.

    b. (0.5 point)

        Briefly describe the "deep pocket" syndrome and propose one reform that would help address it.

    c. (0.5 point)

        Explain whether damages for loss of income could be greater than the plaintiff would have otherwise received while working.

9. (2.25 points)

    a. (0.75 point)

    Briefly describe three criteria used to evaluate government insurance programs.

    b. (1.5 points)

    Evaluate the performance of each government insurance program below using the criteria from part a. above:

    i.   AgriInsurance
    ii. Workers' compensation

10. (1.5 points)

   a. (0.25 point)

   Identify the goal of the Property and Casualty Insurance Compensation Corporation (PACICC).

   b. (1 point)

   Fully describe the funding mechanism and sources of funding for PACICC.

   c. (0.25 point)

   Briefly explain why the costs of involuntary exit are substantially lower in Canada than in the United States or the United Kingdom.

11. (4 points)

    a. (2 points)

       For each insurance program below, fully describe the roles of the government and private industry in providing coverage in the United States:

       i.   Flood
       ii. Terrorism

    b. (2 points)

       Design a financial management model for Canadian flood risk to maximize take-up rates and affordability. Fully support your design.

12. (3.25 points)

    a. (0.25 point)

        Briefly describe the goal of the Facility Association (FA).

    b. (0.5 point)

        Briefly describe each of the following FA risk sharing mechanisms:

           i.   Facility Association Residual Market
          ii.   Risk Sharing Pool (RSP)

    c. (0.75 point)

        Briefly describe one difference and one similarity between the two risk sharing
        mechanisms in part b. above.

    d. (1.25 point)

        Identify the five minimum requirements that a risk must meet in order to be eligible for
        transfer to one of the FA RSPs.

    e. (0.5 point)

        An insurance company writes private passenger automobile insurance in Ontario. The
        company decided to cede certain exposures to the RSP at the beginning of calendar year
        2019.

Type	Direct Business Earned	Incurred Losses
Policies ceded to RSP	$50 million	$100 million
Policies not ceded to RSP	$950 million	$600 million
Total	$1,000 million	$700 million

        Calculate the company's direct loss ratio net of the RSP cession.

13. (1.5 points)

Briefly describe the coverage offered and funding source for the following three Business Risk Management programs:

    i.   AgriInsurance
    ii.   AgriStability
   iii. AgriRecovery

14. (4.75 points)

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

From Annual Return page 80.10 – Commissions:

		Commissions in respect of premiums written						
A. Deferred Commissions at Beginning of Year	B. Unearned Commissions at Beginning of Year	C. Direct	D. Reinsurance assumed	E. Reinsurance Ceded	F. Net	G. Deferred Commissions end of year	H. Unearned Commissions end of year	I. Net Commissions attributable to the period
?	2,200	18,000	0	?	?	?	2,500	17,100

Other financial information from page 80.10:

J. Gross contingent commissions	500
K. Ceded contingent commissions	250
L. Gross other non-deferrable commissions	300
M. Ceded other non-deferrable commissions	100
N. Ceded commission income	600

Other information:

O. Direct unearned premium	120,000
P. Assumed unearned premium	0
Q. Ceded unearned premium	6,000
R. Expected reinsurance premium	5,000
S. Selected undiscounted loss ratio (excl. ULAE)	88.00%
T. Selected ULAE ratio	5.00%
U. Discount rate	3.50%
V. Margin for adverse deviations (MfAD) for claims development	7.00%
W. MfAD for recovery from reinsurance ceded	2.00%
X. MfAD for investment return rates	0.75%
Y. Maintenance expense ratio (% gross premium)	3.50%
Z. Contingent commission rate (% gross premium)	0.00%

Note: Candidates may use the letters A to Z in the formulas in their solutions.

The cumulative accident year payment pattern is as follows:

Age (Months)	% Cumulative Paid
12	60%
24	90%
36	100%

a. (1.25 points)

Calculate the total net commissions as they appear on the Annual Return page 80.10.

b. (3.5 points)

Calculate the premium deficiency, if any.

15. (2.75 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).

Discount rate	3.0%
MfAD for claims development	10.0%
MfAD for recovery from reinsurance ceded	1.0%
MfAD for investment return rates	0.5%
Future income tax rate	36.0%
Unpaid claims and adjustment expenses from P&C Annual Return page 20.20	120,000

The cumulative accident year payment pattern is as follows:

Age (Months)	% Cumulative Paid
12	50%
24	80%
36	100%

The company began writing policies in January 2018 and purchased a 30% quota share reinsurance policy. The amounts reported in the financial statements are equal to the actuarial present values calculated by the actuary.

a. (1 point)

Calculate the undiscounted net unpaid claims.

b. (0.75 point)

Calculate the actuarial present value of unpaid claims ceded to reinsurers.

c. (0.25 point)

Define the asset for future income taxes.

d. (0.75 point)

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

16. (1.75 points)

The following scenarios with and without a catastrophic event are projected for a federally regulated property and casualty insurance company as at December 31, 2018 on a gross of reinsurance basis. All amounts are in thousands of dollars ($000s).

Below are the expected financial statements figures with and without a catastrophic event:

	Without catastrophic event	With catastrophic event
Bonds	750,000	700,000
Cash	150,000	100,000
Gross earned premium	450,000	450,000
Gross incurred losses	325,000	525,000
Expenses	100,000	100,000

The insurer is considering purchasing a catastrophe reinsurance treaty with the following features:

- The treaty costs 5% of gross earned premium and is paid in full at inception.
- The treaty pays for losses from a single event in excess of 20% up to a maximum of 100% of gross earned premium.
- The treaty has a mandatory reinstatement premium provision, with the reinstatement premium due once the treaty attachment is reached on a paid basis.
- The reinstatement premium charge is 2% of gross premium.

The investment yield on bonds and cash is 5%.

Calculate the insurer's total income if the insurer purchases the reinsurance treaty and a catastrophe occurs. Assume there are no other events that would trigger payment on the reinsurance treaty.

17. (3 points)

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

Exceedance probability curves:

Percentile	West Canada	East Canada
0.995	30,000	12,000
0.996	75,000	25,000
0.998	350,000	100,000
0.999	600,000	200,000

Reinsurance program:

Loss Layer	% Ceded
100,000 xs 50,000	50%
150,000 xs 150,000	100%

The following information is also available:

- The insurance company is phasing-in to the countrywide PML 500 requirement.
- No capital market financing is used by the company.
- The total capital & surplus of the company is 400,000.
- The company will use the maximum allowed of its capital & surplus to determine the earthquake reserves.
- The Earthquake Premium Reserve (EPR) is 25,000.

a. (2.5 points)

Calculate the earthquake reserves as at December 31, 2018.

b. (0.5 point)

Identify two elements that earthquake exposure risk management policies and procedures should document.

18. (2.25 points)

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

20.10 – Assets	2018	2017
Recoverable from reinsurers		
Unearned premiums	6,000	5,800
Unpaid claims and adjustment expenses	16,500	16,000
Deferred policy acquisition expenses	9,000	8,700
Receivable from agents and brokers, policyholders and instalment premiums	40,000	35,000

20.20 – Liabilities and Equity	2018	2017
Unearned premiums	60,000	58,000
Unpaid claims and adjustment expenses	184,500	179,000
Unearned commissions	1,250	1,100
Premium deficiency	0	0

Net cumulative paid:

Accident Year	12	24	36
2016	24,000	58,000	75,000
2017	26,000	65,000	
2018	30,000		

Net actuarial present value ultimate:

Accident Year	12	24	36
2016	172,000	170,000	175,000
2017	189,000	195,000	
2018	198,000		

Other information:

- Assume that the net investment income from insurance operations is less than the net investment income plus share of net income (loss) of pooled funds using the equity method.
- The net investment income from insurance operations is 5,200.

Calculate the cumulative discounted excess/(deficiency) ratio for accident year 2017 as at December 31, 2018.

19. (5.25 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 available:

Common shares issued by the company	15,500
Surplus	18,100
Goodwill and intangible assets	2,200
Retained earnings	2,500
Earthquake, nuclear and general contingency reserves	1,000
Accumulated other comprehensive income	4,500
Deferred tax assets	3,600
Category B instruments	7,500
Category C instruments	3,000

Market risk:

Interest rate risk shock factor	1.25%
Bond and debentures (modified duration 4 years)	12,300
Commercial paper (modified duration 3 years)	7,000
Net premium liabilities (modified duration 1.5 years)	8,000
Net unpaid claim and adjustments expenses (modified duration 1.75 years)	13,500
Capital required for foreign exchange risk	150
Capital required for equity risk	1,000
Capital required for real estate risk	200

Assume that there are no allowable interest rate derivatives.

<< QUESTION 19 CONTINUED ON NEXT PAGE >>

Operational risk:

	2018	2017	Risk factor
Direct premiums written in the past 12 months	51,000	34,000	2.50%
Assumed premiums written in the past 12 months arising from third party reinsurance	19,200	12,500	1.75%
Assumed premiums written in the past 12 months arising from intra-group pooling arrangements	0	0	0.75%
Ceded premiums written in the past 12 months arising from third party reinsurance	5,300	4,250	2.50%
Ceded premiums written in the past 12 months arising from intra-group pooling arrangements	0	0	0.75%

Other information:

Capital required for insurance risk	29,500
Capital required for credit risk	5,000
Correlation factor between asset risk margin and insurance risk margin	50%

Calculate the Minimum Capital Test (MCT) ratio and assess whether it meets OSFI's supervisory target expectations.

20. (3.75 points)

A monoline property and casualty insurance company is testing scenarios for its Dynamic Capital Adequacy Testing (DCAT) report. One of the scenarios modelled is a catastrophe occurring on January 1, 2019. The amount of loss at different percentiles of the modelled cumulative distribution are listed below. All amounts are in thousands of dollars ($000s).

Percentile	Gross Catastrophe Loss
90th	100,000
93th	350,000
96th	605,000

The company purchases catastrophe excess-of-loss reinsurance coverage with the following two registered reinsurance companies:

- Reinsurer A: 150,000 xs 50,000
- Reinsurer B: 400,000 xs 200,000

There is no reinstatement premium.

Cumulative payment pattern for catastrophe claims:

Age (Months)	% Cumulative Paid
12	60%
24	100%

Payments are made in the middle of the year. The payment pattern is the same for the insurer and the reinsurers.

Projected MCT results for the first year:

	Base Scenario at 2019/12/31	Adverse Scenario at 2019/12/31
Capital available	37,750	27,000
Capital required for premium liabilities	1,500	1,800
Capital required for unpaid claims	12,750	?
Capital required for catastrophes	300	300
Capital required for reinsurance ceded to unregistered insurers	0	0
Capital required for interest rate risk	2,000	1,750
Capital required for foreign exchange risk	0	0
Capital required for equity risk	1,600	1,600
Capital required for real estate risk	0	0
Capital required for other market risk exposures	450	450
Capital required for counterparty default risk for balance sheet assets	700	700
Capital required for counterparty default risk for off balance sheet exposures	100	100
Capital required for counterparty default risk for unregistered reinsurance collateral and SIRs	0	0
Capital required for operational risk	2,900	4,300
Diversification credit	1,900	?
MCT ratio	278%	?

Other information:

Risk factor for unpaid claims	15%
Discount rate	3%
Claim liabilities margin for adverse deviation (MfAD)	10%
Correlation factor between asset risk margin and insurance risk margin	50%

<< QUESTION 20 CONTINUED ON NEXT PAGE >>

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a. (0.5 point)

Briefly describe two purposes of stress testing.

b. (0.5 point)

Define reverse stress testing and briefly describe how it can help the insurer with its DCAT analysis.

c. (2.25 points)

Calculate the MCT ratio for the plausible adverse catastrophe scenario as at December 31, 2018.

d. (0.5 point)

The company decides to model an additional scenario that includes both the catastrophe and the bankruptcy of a reinsurer. Describe how this would impact the MCT ratio calculated in part c. above.

21. (2 points)

The following information from the DCAT analysis of a federally regulated property and casualty insurance company is available as of December 31, 2018. The three most adverse scenarios are shown below. All amounts are in thousands of dollars ($000s).

		Projection Year 1	Projection Year 2	Projection Year 3	Projection Year 4
Base Scenario	MCT ratio	230%	235%	241%	248%
	Equity	30,000	33,000	37,000	42,000
Misestimation of Policy Liabilities (Unpaid Claims)	MCT ratio	230%	130%	145%	165%
	Equity	30,000	10,000	15,000	23,000
Frequency/Severity (Single Large Claim)	MCT ratio	230%	150%	160%	170%
	Equity	30,000	15,000	20,000	28,000
Decline in the Stock Market (Common Shares Portfolio)	MCT ratio	230%	165%	170%	175%
	Equity	30,000	20,000	24,000	28,000

Under the Decline in Stock Market scenario, there is a very large drop in the value of the common shares portfolio. Investments other than common shares are not impacted. Assume there is no tax implication.

a. (0.5 point)

Assess whether the insurer's financial condition is satisfactory.

b. (1.5 points)

Describe the impact of the Decline in the Stock Market adverse scenario on the following MCT components:

    i.   Capital available
    ii.   Capital required for market risk
    iii. Capital required for operational risk

22. (2 points)

A property and casualty insurance company offers auto and property insurance products for personal and commercial lines of business. The products are sold through various distribution channels including a recently developed mobile application using sophisticated technology. The company operates in Ontario, Alberta, British Columbia and New Brunswick. The investment portfolio is composed primarily of common shares and government bonds.

a. (0.5 point)

Discuss how an Own Risk and Solvency Assessment (ORSA) can help insurers assess their internal targets.

b. (1.5 points)

Indicate whether each item below is accounted for in the MCT calculation and briefly explain whether it should be considered in the company's internal capital target.

   i.   Cyber risk
   ii. Interest rate risk
   iii. Geographical diversification

23. (3 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).

20.10 – Assets	Current year	Prior year
Cash and Cash Equivalents	0	0
Investment Income due and accrued	0	0
Total Investments	380,000	350,000
Recoverable from Reinsurers		
Unearned Premiums	70,000	60,000
Unpaid Claims and Adjustments	140,000	140,000
Total Assets	?	700,000

20.20 – Liabilities and Equity	Current year	Prior year
Unearned Premiums	140,000	120,000
Unpaid Claims and Adjustments	380,000	350,000
Total Liabilities	650,000	600,000

20.30 – Statement of Income	Current year	Prior year
Premiums Written		
Direct	200,000	180,000
Reinsurance Assumed	30,000	20,000
Reinsurance Ceded	80,000	50,000
Underwriting Income (Loss)	13,000	8,000
Net Investment Income	17,000	10,000
Total Income Taxes	7,000	5,000
Net Income (Loss) for the Year	23,000	13,000

20.54 – Statement of Changes in Equity	Current year	Prior year
Total Comprehensive Income for the Year	30,000	18,000
Dividends – Preferred	1,000	1,000
Dividends – Common	14,000	9,000

The company has no income from subsidiaries and no realized capital gains.

<< QUESTION 23 CONTINUED ON NEXT PAGE >>

a. (2 points)

Calculate the following key financial indicators for the current year:

    i.   Return on revenue
    ii.   Net loss reserves to equity
    iii.   Overall net leverage
    iv.   Investment yield

b. (1 point)

Comment on the company's financial health.

24. (1.25 points)

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

Capital Available	250,000
Capital Required	
Fixed income securities	20,000
Credit	12,500
Potential catastrophe losses	15,000
Equity securities	30,000
Reserves	75,000
Business risk	7,000
Interest rate	10,000
Premiums	65,000

a. (1 point)

Calculate Best's Capital Adequacy Ratio (BCAR).

b. (0.25 point)

Briefly describe why A.M. Best uses a covariance adjustment in the BCAR formula.

25. (1 point)

Briefly describe two characteristics of the models used by each of the following credit rating agencies:

    i.   Moody's

    ii.   Standard & Poor's

26. (1.25 points)

    a. (0.5 point)

        Identify an example of Events Not in Data (ENID) for each of the following:

        i.   With a negative (unfavourable) outcome for a property and casualty insurance company
        ii. With a positive (favourable) outcome for a property and casualty insurance company

    b. (0.75 point)

        Briefly describe three reasons it might be useful to try to identify potential ENID, even if it is not a necessary step to calculate the ENID loading.

27. (2.5 points)

    a. (1 point)

    Briefly describe four qualitative principles to consider when estimating the risk adjustment for non-financial risk under IFRS 17.

    b. (0.5 point)

    Identify two differences between current Canadian actuarial standards of practice and IFRS 17 with respect to discounting.

    c. (1 point)

    Identify and briefly describe two methods to select discount rates under IFRS 17.

28. (1.25 points)

    a. (0.5 point)

       Describe an approach that could be used to calculate the discount rate for net claim liabilities.

    b. (0.75 point)

       Identify three possible discount rates to calculate the present value of policy liabilities ceded to reinsurers.

29. (3.25 points)

   a. (1 point)

      Briefly describe four qualifications that OSFI expects in assessing the suitability of an Appointed Actuary (AA).

   b. (0.75 point)

      Briefly describe three objectives sought by OSFI in requiring a peer review of the work of the AA.

   c. (0.75 point)

      Briefly describe three of OSFI's expectations of a full peer review of an AA report.

   d. (0.75 point)

      Briefly describe three examples of material changes that the peer review is expected to consider.

30. (1.5 points)

Identify three criteria that may be used to assess model risk for each of the following:

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

31. (1.5 points)

For each scenario, describe the course of action in response to a potential subsequent event. Note that the actuarial report is as at December 31, 2018 with a report date of January 20, 2019.

a. (0.5 point)

The actuary learns of a series of small missing claims due to miscoding from the claims department. The claims department became aware of this problem on December 28, 2018 but only informed the actuary on January 24, 2019.

b. (0.5 point)

The actuary's insurance company acquired another small insurance company on January 10, 2019; the actuary was made aware of the acquisition on the same day. The acquired company has been extremely unprofitable in recent years.

c. (0.5 point)

A major ice storm, having a very significant impact on the insurance company's financial results, occurred in Eastern Canada from January 2 to January 5, 2019. The actuary became aware of this event as it occurred.

Exam 6C
Regulation and Financial Reporting (Nation Specific)

POINT VALUE OF QUESTIONS

QUESTION	VALUE OF QUESTON	(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	2.00	0.75	0.25	1.00				
2	1.50	0.75	0.75					
3	2.00	0.50	0.75	0.75				
4	1.75	0.50	0.50	0.75				
5	1.50	0.50	1.00					
6	2.00	1.50	0.50					
7	1.75	0.25	1.00	0.50				
8	1.25	0.25	0.50	0.50				
9	2.25	0.75	1.50					
10	1.50	0.25	1.00	0.25				
11	4.00	2.00	2.00					
12	3.25	0.25	0.50	0.75	1.25	0.50		
13	1.50	1.50						
14	4.75	1.25	3.50					
15	2.75	1.00	0.75	0.25	0.75			
16	1.75	1.75						
17	3.00	2.50	0.50					
18	2.25	2.25						
19	5.25	5.25						
20	3.75	0.50	0.50	2.25	0.50			
21	2.00	0.50	1.50					
22	2.00	0.50	1.50					
23	3.00	2.00	1.00					
24	1.25	1.00	0.25					
25	1.00	1.00						
26	1.25	0.50	0.75					
27	2.50	1.00	0.50	1.00				
28	1.25	0.50	0.75					
29	3.25	1.00	0.75	0.75	0.75			
30	1.50	1.50						
31	1.50	0.50	0.50	0.50				
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 70.25

FALL 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: 145
- Available Points: 70.25
- Passing Score: 49.5
- Number of Passing Candidates: 65
- Raw Pass Ratio: 44.83%
- Effective Pass Ratio: 48.15%

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 generally underperformed on Part C of the syllabus. Part C is the most important part within this exam and we urge candidates 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 question 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.

QUESTION 1	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): A1, A2**
SAMPLE ANSWERS	

Part a: 0.75 point

Sample

- Many insurers went bankrupt in 1870's
- Insurance often carries a saving /investing component or function, so it is very important to protect the policyholder
- It was recognized that short term price competition is harmful for insurance

Part b: 0.25 point

Sample 1

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

Sample 2

Guidelines are subject to interpretation, so more flexible than legislation

Sample 3

Guidelines are interpreted rules on how things should be done

Part c: 1 point

Sample 1

- Be forward looking to allow early intervention
- Use sound predictive judgement
- Identification of risk: must be able to identify all material risks
- Differentiate inherent risks and risk management

Sample 2

- Dynamic adjustments
- Sound predictive judgement
- Differentiate between inherent risk and risk mitigation
- Understanding drivers of risks: should understand what the key causes of risks are

EXAMINER'S REPORT

Candidates were expected to understand the historical development of insurance, understand the difference between legislation and guidelines, and know the key principles of OSFI's supervision related to risk assessment.

Part a
Candidates were expected to understand the historical development of insurance and factors that contributed to insurance solvency regulation in the 1870s. Common errors included: • Stating general factors not specifically related to the 1870's • Stating "protection of policyholders" without comment on reasons • Stating "insurance companies are more prone to insolvency"
Part b
Candidates were expected to understand the difference between legislation and guidelines. Common errors included: • Stating "guidelines need disclosure" without commenting on legislation • Stating "legislation is interpreted" without commenting on guidelines
Part c
Candidates were expected to know the principles OSFI uses in its risk assessment of insurance companies. Common errors included: • Providing principles that are not part of OSFI's Supervisory Framework

QUESTION 2	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): A1, A3**
SAMPLE ANSWERS	

Part a: 0.75 point

Sample

- The Ontario Fire Insurance Policy Act was deemed to be intra-vires
- All insurers are treated equally
- Trade is inter-provincial, not intra-provincial

Part b: 0.75 point

Sample

- Insurers incorporated in a single province have the capacity (not the right) to write in other provinces. They will need the other province's approval.
- Foreign insurer might have to be federally licensed even if operating in just one province
- Federally incorporated insurers have right and capacity to operate in all provinces

EXAMINER'S REPORT

Candidates were expected to understand the division of responsibility between federal and provincial/state regulators, the rationale of the decision made by the Privy Council and their implications.

Part a

Candidates were expected to understand the rationale behind Privy Council decision in Citizens Insurance Co. v. Parsons.

Common errors included:

- Mixing up intra-vires and ultra-vires
- Mixing up inter-provincial trade and intra-provincial trade
- Providing answers based on a case other than Citizens Insurance Co. v. Parsons

Part b

Candidates were expected to understand the implications of the Privy Council's decision in The Attorney-General for Canada v. The Attorney-General for Alberta case.

Common errors included:

- Stating foreign insurers must be (instead of may be required to be) federally incorporated to operate in any province or multiple provinces
- Providing answers based on an incorrect case

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 3	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): A2**
SAMPLE ANSWERS	

Part a: 0.5 point

Sample 1
- Accident benefits: benefits paid regardless of fault
- Bodily injury: allows for inured party to sue driver at-fault

Sample 2
- Program delivered through private sector
- Government decides how to deliver it

Part b: 0.75 point

Sample 1
- Ontario has devised a guaranteed safety net for victims of auto accidents and outsourced it to insurance companies without giving them the authority to decide how to deliver it
- The legislation is at once very broad and open to a wide latitude of interpretation and at the same time regulations are very prescriptive as to how insurance companies can deliver the product
- This creates an opening for disputes as to interpretation on the one hand and restrictions on efficiency on the other

Sample 2
- Insurers are focusing on cost control instead of proper care. Victims don't recover and final costs are higher, not lower
- Lawyers earn a contingent fee, so they are trying to maximize awards instead of getting proper care for victims
- Victims seek to maximize entitlements, instead of the care they actually need

Sample 3
- Producers are paid on volume of treatment, not results
- Lawyer: contingent fee is a percentage of settlement, lawyer seeks to maximize settlement rather than address medical care need
- Victims focus on maximizing entitlement rather than addressing their medical care need

Part c: 0.75 point

Sample 1
- Give more regulatory freedom to insurers so that they can compete on price and service
- Change the catastrophic compensation system
- Focus on care not cash

Sample 2
- Fix structural flaws by appointing an arm's-length regulator that has power to enact policies and procedures

- Change compensation system for catastrophic injuries since lawyers are taking too big of chunk
- Make contingent fee more transparent and simplify benefit, so less need for lawyers

EXAMINER'S REPORT

Candidates were expected to have a basic understanding of the current mandatory Ontario automobile injury compensation system, be able to explain why the current system is flawed, and describe actions the government can take to improve the system as explained in the Marshall report.

Part a

Candidates were expected to have a basic understanding of the current mandatory Ontario automobile injury compensation system.

Common errors included:
- Only stating one part of the two part system, for example, stating "no-fault accident benefit" without mentioning the tort for BI
- Stating "AB and BI" without providing further explanations

Part b

Candidates were expected to be able to explain why the current system is flawed.

Common errors included:
- Not providing a full explanation of why the system is flawed, for example, simply stating "cash not care" or "lawyer fee" without providing enough explanations
- Stating "premiums are too high" without relating to how the system is flawed

Part c

Candidates were expected to understand the actions the government can take to improve the current system.

Common errors included:
- Not providing a full explanation of why the system is flawed, for example, simply stating "fix structure flaws" without providing enough explanations

QUESTION 4	
TOTAL POINT VALUE: 1.75	**LEARNING OBJECTIVE(S): A2**
SAMPLE ANSWERS	

Part a: 0.5 point

Sample (two of the following)
- ICBC uses a litigation-based model
- They allow not-at-fault drivers to sue at-fault drivers in any case, regardless of severity of injury
- Public insurance for basic coverage

Part b: 0.5 point

Sample responses (any two of the following)
- Frequency of accidents are increasing
- Severity of minor-injury claims are increasing
- Since it is mainly tort, most losses are paid to lawyers thus the increase in loss & prem
- Risk classification doesn't change enough for high-risk
- There is no minor injury capping
- Premiums collected are not enough to cover the increasing claim cost

Part c: 0.75 point

Sample responses (any three of the following)
- Replace by private insurers
- Charge actuarially sound premium / Risk-based pricing
- Focus on providing care
- Limit benefits from litigation with caps of non-pecuniary damages
- Mixed system like in Quebec / Hybrid model
- Increase no-fault AB benefits levels to discourage litigation
- Use the money generated from road safety measures like traffic cameras to fund system

EXAMINER'S REPORT

Candidates were expected to understand the underlying mechanism of motor vehicle insurance in British Columbia and the issues leading to premium deficiency.

Part a

Candidates were expected to know that BC has a public insurance litigation-based system providing basic coverage.

A common error included:
- Providing an incomplete answer, for example, "Crown Corporation" without mentioning basic coverage
- Providing an incorrect answer, for example, "litigation no-fault"

Part b

Candidates were expected to identify issues that led the system to its current state.

Common errors included:
- Providing an incorrect answer, for example, "lack of competition"
- Not mentioning issues related to insurance affordability

Part c

Candidates were expected to propose an alternative system, either a hybrid or private model, that could potentially solve the issues of the current state.

A common error included:
- Not adequately describing the benefits of the alternative system proposed

QUESTION 5	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): A2**
SAMPLE ANSWERS	

Part a: 0.5 point

Sample 1
- As an underwriting criterion
- As a rating variable

Sample 2
- Rating variable
- Assignment into Tier (FARM and/or RSP)

Part b: 1 point

Sample 1
Advantages:
- Statistically significant
- Easy to obtain and verify

Disadvantages:
- Can be unfairly discriminatory to certain groups such as new immigrants
- There are privacy concerns related to credit score

Sample 2
Advantages:
- Credit score is highly predictive
- Can be adjusted based on economic cycles to not affect aggregate premium

Disadvantages:
- It can be affected by identity theft
- It is intrusive

EXAMINER'S REPORT

Candidates were expected to know the main uses of credit scores in the context of personal property insurance and their respective advantages as well as disadvantages.

Part a

Candidates were expected to identify two uses of credit scores in personal property insurance.

A common error included:
- Listing two uses that are a restatement of each other (i.e., for ratemaking and discount setting)

Part b
Candidates were expected to list two advantages and two disadvantages of the use of credit scores by an insurer. Common errors included: • Stating that there may be errors in the data • Stating that credit score is inaccurate without stating the reason

QUESTION 6	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): A3**
SAMPLE ANSWERS	

Part a: 1.5 points

Sample

- Does reliance exist? Yes, since insured relies on MPIC to have maximum coverage
- Is reliance expected? Yes, since insured is not familiar with type of coverage
- Is reliance reasonable? Yes, MPIC ought to know

Part b: 0.5 point

Sample

Duty of care is owed by both but private agents owe a higher standard of care because there is a higher degree of personalization promised by the private business model.

EXAMINER'S REPORT

Candidates were expected to demonstrate an understanding of the duty of care between clients and agents.

Part a

Candidates were expected to describe the existence of reliance, the expectation of reliance and reasonableness of the reliance to establish a duty of care.

A common error included:

- Not answering the question by discussing a breach in the duty of care

Part b

Candidates were expected to contrast the duty of care of private and public agents.

Common errors included:

- Discussing issues not related to their duty of care
- Stating that a public agent has a higher duty of care

QUESTION 7	
TOTAL POINT VALUE: 1.75	**LEARNING OBJECTIVE(S): A3**
SAMPLE ANSWERS	

Part a: 0.25 point

Sample 1
Damages not easily quantified financially (e.g. pain & suffering)

Sample 2
Non-economic loss arising out of physical or psychological pain and suffering

Sample 3
Non-pecuniary damages are damages on pain and suffering that do not relate to financial losses

Part b: 1 point

Sample answers (maximum one answer from each of the four following categories)
- Limitless awards (one of the following)
  - The pain and suffering awards can be limitless if there is no cap
  - Limitless claims lead to extravagant awards
  - Lack of a cap leads to extravagant awards
- Compensation (one of the following)
  - No money can provide true restitution
  - Victims are already fully compensated for income loss and future care
  - Non-pecuniary damage is not to indemnify the victims because they have been compensated for medical costs and loss of income
- Insurance environment (one of the following)
  - It creates a more appropriate environment for insurers as losses are more predictable
  - Having predictable and stable rewards creates a good environment for insurers which then lower premium for policyholders
  - Creates predictable results so more insurers will be willing to enter the market (good for insureds availability)
- Social burden (one of the following)
  - Extravagant award may lead to social burden and affect affordability and availability
  - Excessive awards could lead to increased insurance costs which may result in social burden
  - Extraordinary amount of awards lead to affordability and availability issue of insurance market, which lead to social burden

Part c: 0.5 point

Samples (any 2 of the following 3)
- Sexual abuse
- Defamation
- Negligence causing financial loss

SAMPLE ANSWERS AND EXAMINER'S REPORT

EXAMINER'S REPORT
Candidates were expected to understand the definition of non-pecuniary awards, the reasons a cap was introduced, and when exceptions to the cap apply.

Part a
Candidates were expected to provide the definition of non-pecuniary damages or describe the type of damage these awards are compensating for. A common error included: • Providing an incorrect definition, for example, stating "Damages not injury related to the insured but the damages financially sustained from the claims process" • Not specifying an intangible injury for which "non-financial damages" were being awarded

Part b
Candidates were expected to know why the Canadian legal system introduced a cap on non-pecuniary damages. Common errors included: • Providing two responses from the same category of reasons, for example, "not to provide compensation, but to make life easier" and "no amount of money can bring back what was lost" • Providing tort reforms unrelated to the non-pecuniary cap

Part c
Candidates were expected to know the exceptions for which the cap on non-pecuniary damages does not apply. Common errors included: • Providing incorrect exceptions, for example, "fraudulent damages" • Providing a correct exception but associating it with a court decision not related to the Trilogy • Answering "negligence" but not specifying that it should be "negligence causing financial loss"

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 8	
TOTAL POINT VALUE: 1.25	**LEARNING OBJECTIVE(S): A4-a**
SAMPLE ANSWERS	

Part a: 0.25 point

Sample answers (one of the following)
- After reform, the victims may not get full compensation if any of defendants go bankrupt
- Victims may not always get paid in full
- Longer trials to determine % liable for defendant
- After replacement to proportionate liability, we will have more trials to determine share of liability. Efficiency will decrease and legal costs will increase.

Part b: 0.5 point

Sample 1
- Victims go after company with deepest pockets to pay total loss even if they have small degree of liability
- Replace joint & several liability with proportional liability

Sample 2
- Under the current joint and several liability legal framework, a defendant who is found one percent guilty can be liable to pay up to 100% of the loss
- Remove vicarious liability

Part c: 0.5 point

Sample
If reform, no because plaintiff would receive compensation on a net basis instead of gross, and must present collateral source.
Currently, the basis is gross income and no collateral source needs to be admitted so plaintiffs receive more than their net loss.

EXAMINER'S REPORT

Candidates were expected to demonstrate knowledge of trends in tort litigation.

Part a

Candidate were expected to present an argument as to why lawyers may oppose change to joint and several liability.

A common error included:
- Stating that lawyers' compensation would be lower. This answer does not address the importance of the efficiency of the legal system and the impact on the plaintiff as they may not be fully compensated.

Part b

Candidates were expected to identify the inverse link between liability level and monetary resources for deep pocket syndrome.

Common errors included:
- Not establishing the link between liability level and monetary resources

Part c

Candidates were expected to correctly identify that income was replaced on a gross basis and that currently plaintiffs can recover from dual sources which may lead to overcompensation.

A common error was:
- Stating that expenses while not working were lower without linking the answer to compensation

QUESTION 9	
TOTAL POINT VALUE: 2.25	**LEARNING OBJECTIVE(S): B.3**
SAMPLE ANSWERS	

Part a: 0.75 point

Sample
- Whether it's social welfare / insurance program
- Whether it's efficient or accepted by the public
- Whether it's necessary or serves social purpose

Part b: 1.5 points

i. AgriInsurance
(Each of the responses was expected to align with a criterion provided in part a.)
- Relating to social welfare / insurance program (one of the following)
  - It's insurance, producers pay a premium for the coverage (although it's subsidized)
  - Insurance since government pays out when there are adverse events
- Relating to being efficient or accepted by the public (one of the following)
  - It's efficient because the government already has infrastructure set up and easier to get the funding
  - It's efficient, uses already established government bodies like prov. departments of agriculture, + no profit in the price + expenses covered.
- Relating to being necessary or serving social purpose (one of the following)
  - It serves social purpose because farmers have low income and it stabilizes the producer's income
  - It's necessary as govt is subsidizing most of it

ii. Workers' compensation
(Each of the responses was expected to align with a criterion provided in part a.)
- Relating to social welfare / insurance program (one of the following)
  - It is insurance -> prems are paid + payment only in case of loss
  - Insurance since pays only when worker is injured
- Relating to being efficient or accepted by the public (one of the following)
  - It's efficient because government already has the infrastructure set up
  - It's efficient -> no profit -> lower cost to employers
- Relating to being necessary or serving social purpose (one of the following)
  - It serves social purpose because the goal is to have less congestion in court and to immediately recover injured workers to work
  - It is necessary, potentially could be provided by private market but at a higher price

EXAMINER'S REPORT
Candidates were expected to be familiar with government insurance programs and the criteria used to evaluate them.

SAMPLE ANSWERS AND EXAMINER'S REPORT

Part a
Candidates were expected to provide criteria used to evaluate government insurance programs. A common error included: •   Providing evaluation criteria which were not applicable or overly generic, for example, "insurance"

Part b
Candidates were expected to evaluate AgriInsurance and Workers' Compensation using the criteria they provided in part a. Common errors included: •   Not using each of the criteria identified in part a. to evaluate the programs •   Not explaining how the program met the criteria, for example, simply stating "it is efficient" •   Using an incorrect argument to evaluate the program, for example, "it is insurance since the employee pays premiums"

QUESTION 10	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): B1,B2**
SAMPLE ANSWERS	

Part a: 0.25 point

Sample 1
Protect policyholder in the event of insurer insolvency for unpaid claims and unearned premium.

Sample 2
Compensate the policyholder in case of an involuntary market exit by insurer.

Part b: 1 point

Sample 1
- Pre-insolvency funding of compensation fund through a special levy
- Assessments to solvent members
- The % of a member's assessment is based on the % of written premium compared to the market in the jurisdictions the insolvent insurer was operating
- PACICC limits the assessment to 1.5% of DWP

Sample 2
- Investment income accumulated to fund
- PACICC can borrow money from its fund and delay compensation, to be repaid with interest
- Assess solvent member companies based on their market share
- Assessments are limited to the shortfall between amounts advanced by PACICC and what is recovered from the insolvent insurer & 3rd parties

Part c: 0.25 point

Sample 1
Dividends from the liquidation are returned to the solvent member companies in Canada.

Sample 2
Dividends are kept for future insolvencies in the USA and UK.

EXAMINER'S REPORT

Candidates were expected to understand the role and operations of PACICC and how it compares to other insurer insolvency mechanisms internationally.

Part a

Candidates were expected to understand the role of PACICC in the event of an insurer insolvency.

Common errors included:
- Stating that PACICC prevents insolvencies
- Stating that PACICC protects policyholders without specifying how

Part b
Candidates were expected to list the sources of funding for PACICC. Common errors included: • Listing third party recoveries when member assessments are excess of third party recoveries • Listing compensation fund with no explanation • Stating that the assessment is capped at a % of premium without reference to the actual percent • Listing market financing • Listing government support without any explanation Although PACICC acts like an intermediary between the insolvent insurer, liquidator and policyholder, and PACICC may make payments from the insolvent insurer's liquidated assets, these liquidated assets do not constitute a source of funding for the compensation plan as they would be available for use irrespective of PACICC's existence. Although credit was awarded for this answer in the fall 2019 exam, credit will no longer be given in future exams.
Part c
Candidates were expected to understand the difference between exit costs in Canada vs the US/UK. Common errors included: • Stating how OSFI has a supervisory target capital level for MCT > 150% • Stating that the US/UK does not have an organization like PACICC • Stating that PACICC covers the costs of exit • Confusing Canada with the US/UK

QUESTION 11	
TOTAL POINT VALUE: 4	**LEARNING OBJECTIVE(S): B2, B3**
SAMPLE ANSWERS	

Part a: 2 points

i. Flood

Sample

- Insurance coverage is standalone coverage
- It's underwritten based on a government set pricing and rules
- All claims are covered by government
- Private insurers are only facilitating

ii. Terrorism

Sample

- Can be standalone or bundled with property insurance
- Private insurers write the business and settle the claims
- Private insurers cover terrorism claims up to a specified limit
- Government acts as a reinsurer -> only covers losses for certified terrorism events and only in excess of the imposed limit

Part b: 2 points

Sample

- Bundle coverage with homeowners insurance -> this will ensure subsidization between low and high risk insureds
- Use risk-based pricing – this will make customers more likely to implement risk mitigation initiatives
- Make it mandatory for all properties -> this will maximize take-up rates and ensure loss sharing
- Make government an enabler -> make sure there are accurate flood maps used for risk management and pricing + invest in flood defense infrastructure
- Subsidization by other customers not taxpayers under this design

EXAMINER'S REPORT

Candidates were expected to demonstrate a basic understanding of the US flood and terrorism programs and to demonstrate a strong understanding of insurance program design.

Part a

Candidates were expected to describe the relationship between private and government for flood and terrorism insurance program in the US in full details.

Common errors included:
- Incorrectly describing the current relationship

Part b

Candidates were expected to identify criteria pertaining to an insurance program design and to link these criteria to the impact on affordability or take up rates.

A common error included:
- Not linking the criteria with the impact on either affordability or take up rates

QUESTION 12	
TOTAL POINT VALUE: 3.25	**LEARNING OBJECTIVE(S): B1-B2**
SAMPLE ANSWERS	

Part a: 0.25 point

Sample 1
Every person licensed to drive has access to mandatory auto insurance coverage needed to operate a vehicle.

Sample 2
Ensure availability of auto insurance for everyone who can legally operate an automobile.

Part b: 0.5 point

i. FARM
Sample 1
Residual market for drivers who can't find coverage in voluntary market, declined everywhere

Sample 2
Provide insurance for risks that were not able to find insurance in the private market

ii. RSP
Sample 1
Pool where private insurers can cede their unprofitable high risk business and losses shared with industry

Sample 2
Insurers can send risks with inadequate premium to a pool where premium and losses are shared

Part c: 0.75 point

Differences:
Sample 1
FARM: uses FA rates. RSP: uses ceding company's rates.

Sample 2
Insured is aware they are in FA but not aware if they are in RSP.

Similarities:
Sample 1
Both are mechanisms where losses and premiums are shared among insurers in the industry.

Sample 2
Results/losses are paid for by participating members.

Part d: 1.25 points

Sample
- Must be PPA

- Must not be eligible for FARM
- Must have minimum statutory TPL limit
- Must use approved rates
- Must follow insurer's classification and rating procedures

Part e: 0.5 point

Sample 1

In ON, insurer retains 15% of the exposure from risks ceded into the pool.

$(600 + 100 \times 0.15)/(950 + 50 * 0.15) = 64.23\%$

Sample 2

$950,000 + 50,000(0.15) = 957,500$

$600,000 + 100,000(0.15) = 615,000$

Net RSP Direct LR = $615,000/957,500 = 64.23\%$

EXAMINER'S REPORT

Candidates were expected to understand the objectives and operations of the residual personal insurance markets operating in Canada.

Part a

Candidates were expected to discuss the Facility Association's (FA) goal of ensuring the availability of automobile insurance.

Common errors included:
- Not including enough detail such that FA is concerned with automobile insurance, or other related words like "licensed driver", "vehicle owner", etc.
- Not correctly identifying the goal of FA by stating that FA is only concerned with the Risk Sharing Pool (RSP) or Facility Association Residual Market (FARM) risks instead of ensuring auto insurance is available to all owners and licensed drivers of motor vehicles who need the insurance to legally operate those vehicles.

Part b

Candidates were expected to briefly describe the two risk sharing mechanisms.

A common error included:
- Not including enough detail on the RSP pooling mechanism. Candidates were expected to mention some aspect of the pool being industry wide, and losses being shared.

Part c

Candidates were expected to provide both a meaningful difference and similarity between the FARM and RSP risk sharing mechanisms.

Common errors included:
- Not providing a meaningful comparison, for example, stating "both FA and RSP achieve the goal of FA"

- Not providing a similarity

Part d

Candidates were expected to identify the five requirements to be eligible to transfer risk to the pool.

There were no common errors. Most of the responses not receiving full credit were due to providing fewer than five requirements.

Part e

Candidates were expected to demonstrate knowledge of the RSP structure in Ontario including calculating the direct loss ratio net of RSP cession.

A common error included:
- Not accounting for the Ontario specific 15% of transferred risks that remain with the ceding company, for both premiums and losses

QUESTION 13	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): B1-B2**
SAMPLE ANSWERS	

i. AgriInsurance
Sample 1
Protects against decrease in production; funded by insured, provincial government, federal government

Sample 2
Protects producers from decreases in yield. Funded by producers – Prov –Federal

Sample 3
Protects against production loss; Producers 40%, Provincial 24%, Federal: 36%

ii. AgriStability
Sample 1
Protects against margin deterioration; funded by insured, provincial gov, federal government

Sample 2
Protects producers from variation in production margin. Funded by producers – Prov – Fed

Sample 3
Protects against margin decline; Provincial: 40%, Federal: 60%

iii. AgriRecovery
Sample 1
Protects against disasters; funded by provincial and federal governments

Sample 2
Provides recovery after a disaster to producers. Funded by provincial and federal governments.

Sample 3
Protects against natural disaster; Provincial: 40%, Federal: 60%

EXAMINER'S REPORT

Candidates were expected to demonstrate their understanding of agricultural insurance in Canada by briefly describing the coverage offered and funding source of the three agricultural risk management programs.

For the funding source for part (ii) AgriStability, both "producer, provincial and federal governments" as well as "provincial and federal governments" were accepted as valid answers. Although the AgriStability program is mainly funded by the provincial and federal governments in proportions of 40% and 60%, producers make some contributions to cover a portion of expected losses and administrative expenses; therefore answers including and excluding "producers" were accepted.

SAMPLE ANSWERS AND EXAMINER'S REPORT

Common mistakes include:
- Providing the coverage offered only without mentioning funding source.
- Not specifying the level of government involved (provincial or federal).
- Stating percentage of funding source distribution among the sources but providing an incorrect percentage

QUESTION 14	
TOTAL POINT VALUE: 4.75	**LEARNING OBJECTIVE(S): C1**
SAMPLE ANSWERS	

Part a: 1.25 points

Sample 1

Ceded Commission Income = Unearned Commission at Beginning – Unearned Commission at End + Ceded Commissions

600 = 2200 – 2500 + Ceded Commissions

Ceded Commissions = 900

Net Commissions Attributable to the period = Deferred Commissions at Beginning – Deferred Commissions at End + Direct Commissions + Assumed Commissions – (Unearned Commissions at Beginning - Unearned Commissions at End + Ceded Commissions)

17,100 = Deferred Commissions at Beginning – Deferred Commissions at End + 18,000 + 0 – (2200 – 2500 + 900)

Deferred Commissions at Beginning – Deferred Commissions at End = -300

Gross Commission Expense = Deferred Commissions at Beginning – Deferred Commissions at End + Direct Commissions + Assumed Commissions

= -300 + 18,000 + 0

= 17,700

Total Gross Commission = Gross Commission Expense + Gross Contingent Commission + Gross other non-deferable commissions

= 17,700 + 500 + 300

= 18,500

Total Ceded Commission = Ceded Commission Income + Ceded Contingent Commission + Ceded other non-deferable commissions

= 600 + 250 +100

= 950

Total Net Commissions = 18,500 – 950 = 17,550

Sample 2

N = B – H + E

E = 900

I = Deferred Commissions at Beginning – Deferred Commissions at End + C + D – (B – H + E)

Deferred Commissions at Beginning – Deferred Commissions at End = -300

Gross Commission Expense = Deferred Commissions at Beginning – Deferred Commissions at End + C + D

= -300 + 18,000 + 0

= 17,700

Total Gross Commission = Gross Commission Expense + J + L
= 17,700 + 500 + 300
= 18,500

Total Ceded Commission = N + K + M
= 600 + 250 +100
= 950

Total Net Commissions = 18,500 – 950 = 17,550

Sample 3
Total Net Commissions = Total Gross Commission - Total Ceded Commission

Net Commissions Attributable to the period = Gross Commission Expense – Ceded Commission Income
17,100 = Gross Commission Expense – 600
Gross Commission Expense = 17,700

Total Gross Commission = 17,700 + 500 + 300
= 18,500

Total Ceded Commission = 600 + 250 +100
= 950

Total Net Commissions = 18,500 – 950 = 17,550

Sample 4
Total Net Commissions = Total Gross Commission - Total Ceded Commission

I = Gross Commission Expense – Ceded Commission Income
17,100 = Gross Commission Expense – 600
Gross Commission Expense = 17,700

Total Gross Commission = 17,700 + J + L
= 18,500

Total Ceded Commission = N + K + M
= 950

Total Net Commissions = 18,500 – 950 = 17,550

Sample 5
Total Net Commissions = Net Commissions attributable to the period + Net Contingent Commissions + Net Other Non-Deferrable Commissions
= 17,100 + (500 – 250) + (300 – 100)

= 17,500

Sample 6
Total Net Commissions = I + (J - K) + (L - M)
= 17,550

Part b: 3.5 points

Sample 1
Assumed ULAE ratio is a % of Premiums → ULAE = 5.00% * 120,000 = 6,000
ULAE = T * O = 6,000

Net Undiscounted Losses = (Net Unearned Premium – Future Reinsurance Cost) *ELR + ULAE
= [(O – Q) – R] * S + 6,000
= [(120,000 – 6,000) – 5,000] * 88% + 6,000
= 101,920

t	PV@3.5%	PV@2.75%
0.5	60% * 1.035^-0.5	60% * 1.0275^-0.5
1.5	30% * 1.035^-1.5	30% * 1.0275^-1.5
2.5	10% * 1.035^-2.5	10% * 1.0275^-2.5
	Sum = 0.966	Sum = 0.973

Adjustment for average accident date
Adj PV @ 3.5% = 0.966 * 1.035^(1/2 – 1/3) = 0.972
Adj PV @ 2.75% = 0.973 * 1.0275^(1/2 – 1/3) = 0.978

Net PV = 101,920 * 0.972 = 99,066
Gross PV = (120,000 * 88% + 6,000) * 0.972 = 108,475
Ceded PV = 108,475 – 99,066 = 9,409

Net APV = 101,920 * 0.978 + 99,066 * 7.00% + 9,409 * 2.00%
= 106,781

Maintenance Expense = O * Y = 120,000 * 3.5% = 4,200

Premium Liabilities = Net APV + Expected Reinsurance Premium + Maintenance Expense +
Contingent Commission
= 106,781 + 5,000 + 4,200 + 0
= 115,981

Gross Unearned Commissions = H = 2,500

Equity in Unearned Premium = Net UPR – Premium Liabilities + Gross Unearned Commissions
= 114,000 – 115,981 + 2,500
= 519

Since the max DPAE > 0, the premium deficiency is 0.

Sample 2
Net Unearned Premium = O + P – Q = 120,000 + 0 – 6,000 = 114,000
Gross Unearned Premium = O + P = 120,000 + 0 = 120,000

Assumed ULAE ratio is a % of Losses → ULAE = 5.00% * 120,000 * 88% = 5,280
ULAE = T * O * S = 6,000

Net Undiscounted Losses & LAE = (114,000 – R) * S + 5,280
= (114,000 – 5,000) * 88% + 5,280
= 101,200

Gross Undiscounted Losses & LAE = 120,000 * 88% + 5,280 = 110,880

PV factor @ 3.5% = [0.60/(1.035^0.5) + 0.30/(1.035^1.5) + 0.10/(1.035^2.5)] * 1.035^(0.5-1/3)
= 0.9720

PV factor @ 2.75% = [0.60/(1.0275^0.5) + 0.30/(1.0275^1.5) + 0.10/(1.0275^2.5)] * 1.0275^(0.5-1/3)
= 0.9778

Net PV @ 3.5% = 101,200 * 0.9720 = 98,366
Net PV @ 2.75% = 101,200 * 0.9778 = 98,954
Gross PV @ 3.5% = 110,880 * 0.972 = 107,775
Ceded PV @ 3.5% = 107,775 – 98,366 = 9,409

Claims Development PFAD = 98,366 * V = 98,366 * 7.00% = 6,886
Interest Rate PFAD = 98,954 – 98,366 = 588
Reinsurance PFAD = 9,409 * W = 9,409 * 2.00% = 188

Net APV = 98,366 + 6,886 + 588 + 188 = 106,028

Maintenance Expense = O * Y = 120,000 * 3.5% = 4,200

Premium Liabilities = Net APV + Expected Reinsurance Premium + Maintenance Expense + Contingent Commission
= 106,028 + 5,000 + 4,200 + 0
= 115,228

Gross Unearned Commissions = H = 2,500

Equity in Unearned Premium = Net UPR – Premium Liabilities + Gross Unearned Commissions
= 114,000 – 115,228 + 2,500
= 1,272

SAMPLE ANSWERS AND EXAMINER'S REPORT

Since the max DPAE > 0, the premium deficiency is 0.

EXAMINER'S REPORT

Candidates were expected to know the components of total net commissions and be able to determine whether a premium deficiency exists.

Part a

Candidates were expected to understand how to derive the total net commissions using the components from page 80.10 of the P&C Return.

Common mistakes included:
- Not knowing the formula for gross commission expense

Part b

Candidates were expected determine the premium deficiency, or the maximum allowable DPAE, given all the components and assumptions that would normally be available to the actuary when performing the calculation.

Credit was given to candidates when a mistake in calculation led to a negative equity in unearned premium if they indicated this would be a premium deficiency.

Common errors included:
- Assuming the ULAE ratio is applied to both gross and net losses or gross and net premiums, which meant a ceded ULAE > 0. Since this is very uncommon in practice, credit was only given if it was clearly stated that ULAE is assumed to be ceded as part of the reinsurance contract.
- Excluding the expected reinsurance premium when determining ceded losses, either by deducting it from gross unearned premiums, or by calculating ceded losses directly from ceded unearned premiums without adding the expected reinsurance premium.
- Determining the reinsurance PfAD as a percent of the expected reinsurance premium.
- Using gross unearned premiums to calculate equity in unearned premiums, instead of net unearned premiums.
- Not adding gross unearned commissions to the equity in unearned premium.
- Using a commission other than gross unearned commissions in the equity in unearned premium calculation.

QUESTION 15	
TOTAL POINT VALUE: 2.75	**LEARNING OBJECTIVE(S): C1**
SAMPLE ANSWERS	
Part a: 1 point	

Sample

APV(UCL) = 120,000 this is gross basis

Assuming Undisc Gross UCL = L

PV Factor

Age	T	% Incr Paid	Adjusted	PV Factor @ 3%	PV Factor @ 3% - 0.5% = 2.5%
24	0.5	80% - 50% = 30%	30% / 50% = 60%	0.5912	0.5926
36	1.5	20%	40%	0.3827	0.3855
		50%	100%	0.9738	0.9781

$PV(UCL^G) = 0.9738L$

APV(UCLG) = 120,000 = 0.9781L + 0.9738L * 10% No ceded PfAD on gross basis

→ L = 111,578

→ Undisc Net UCL = 111578 * (1 - 30%) = 78105

Part b: 0.75 point

Sample

Ceded unpaid = 111,578 * 0.3 = 33,473.4

APV ceded = 33,473.4 * 0.9781 + 33,473.4 * 0.9738 * 0.1 - 33,373.4 * 0.9738 * 0.01 = 35,674

Part c: 0.25 point

Sample

It is an asset that represents prepayment of taxes as a result that liability deducted for tax purpose being lower than reported in balance sheet.

Part d: 0.75 point

Sample

Net APV = Gross APV - Ceded APV = 120,000 - 35674.0186 = 84325.9814

Reported reserve = net APV

[RR - 95%[min(RR,APV)] * (Tax rate) * (1 - PVFactor(2.5%))

= (84325.9814 - 0.95(83425.9814)) * (0.36) * (1 - 0.97809321) = 33.25160818 => 33.25

EXAMINER'S REPORT

Candidates were expected to know formulas for gross, ceded and net actuarial present values, the definition of the asset for future income taxes and the effects of discounting the asset for future income taxes.

Part a

Candidates were expected to know that the unpaid claims and adjustment expenses from the P&C Return, page 20.20 are on a gross basis and how to calculate items within the gross APV formula.

Common errors included:
- Using the gross APV as the net APV
- Using the gross APV as the undiscounted gross unpaid claims
- Using a cession ratio of 70% instead of 30%
- Not calculating the net undiscounted gross unpaid claims

Part b

Candidates were expected to know how to calculate items within the ceded APV formula.

Common errors included:
- Adding the reinsurance PfAD to the ceded APV instead of subtracting it
- Applying a pro-rata factor to the gross or net APV to calculate the ceded APV
- Missing items in the ceded APV calculation, for example, claims PfAD is missing

Part c

Candidates were expected to know the definition of the asset for future income taxes or know when an asset for future income taxes arises.

Common errors included:
- Providing an incorrect definition, for example, giving the definition for deferred policy acquisition expenses
- Stating that the prepayment of tax as a result of the liability deducted for tax purposes is greater than, instead of less than, the amount reported on the balance sheet
- Not being specific, for example, "It is the tax credit/asset due to losses being understated currently"

Part d

Candidates were expected to know how to apply the formula for estimating the effect of discounting the asset for future income taxes

Common errors included:
- Assuming that there is no discounting effect because the reported amount equals the APV
- Assuming that the discounting effect is equal to the effect of discounting the net APV
- Using the incorrect PV factor
- Using the gross APV in the formula instead of the net APV
- Applying a formula with an error, for example, using "(1 - tax rate)" instead of the "tax rate" in estimating the effect of discounting the asset for future income taxes

QUESTION 16	
TOTAL POINT VALUE: 1.75	**LEARNING OBJECTIVE(S): C1**
SAMPLE ANSWERS	

Sample

Total income = U/W income + Inv. Income

U/W income = NEP – Net loss – expenses

NEP = GEP – ceded EP
    = 450,000 – (.05 + .02) 450,000
    = 418,500

Net losses = 525,000 – min(450,000, 200,000 – 450,000(.2))
        = 525,000 – 110,000
        = 415,000

Expenses = 100,000

Inv Income = (700,000 + 100,000 – (.05 + .02)(450,000)) (.05)
        = 38,425

Total Income = 418,500 – 415,000 – 100,000 + 38,425
        = -58,075

EXAMINER'S REPORT

Candidates were expected to know how to calculate underwriting income including how to calculate net earned premiums and net losses based on the catastrophe reinsurance treaty, as well as how to calculate investment income.

Common errors included:
- Calculating covered losses of $110,000 incorrectly
- Assuming the catastrophe treaty applies to all losses, not just those from the catastrophic event
- Not accounting for the reinstatement premium (2% of $450,000)
- Not using cash as investment in the investment income calculation
- Not reducing cash and bonds by the ceded premium and reinstatement premium
- Calculating net income incorrectly, for example:
  o Not including expenses
  o Not including investment income
  o Including assets

QUESTION 17	
TOTAL POINT VALUE: 3	**LEARNING OBJECTIVE(S): C1, C2**
SAMPLE ANSWERS	

Part a: 2.5 points

Sample 1

East Canada PML 500 < West Canada PML 500 and East Canada PML 250 < West Canada PML 250 so East Canada PML 420 < West Canada PML 420

West Canada PML 420 = 0.68 * West Canada PML 500 + 0.32 * West Canada PML 250
= 0.68 * 350 000 + 0.32 * 75 000 = 262 000

Countrywide PML 500 = (East Canada PML $500^{1.5}$ + West Canada PML $500^{1.5}$)$^{1/1.5}$
= (100 000$^{1.5}$+350 000$^{1.5}$)$^{1/1.5}$ = 384 784

Countrywide PML 2018 = Countrywide PML 500*(2018-2014)/8 + max(East Canada PML 420, West Canada PML 420)*(2022-2018)/8
= 384 784 * 4/8 + 262 000 * 4/8 = 323 392

Financial resources = capital & surplus allocated to EQ + EPR + reinsurance coverage + capital market financing = 400 000 * 10% + 25 000 + (100 000 * 50% + 150 000) + 0 = 265 000

Earthquake Reserves = (Countrywide PML 2018 – Financing resources + EPR) * 1.25
= (323 392 – 265 000 + 25 000) * 1.25 = 104 240

Sample 2

East Canada PML 420 = 0.68 * East Canada PML 500 + 0.32 * East Canada PML 250
= 0.68 * 100 000 + 0.32 * 25 000 = 76 000

West Canada PML 420 = 0.68 * West Canada PML 500 + 0.32 * West Canada PML 250
= 0.68 * 350 000 + 0.32 * 75 000 = 262 000

Countrywide PML 500 = (East Canada PML $500^{1.5}$ + West Canada PML $500^{1.5}$)$^{1/1.5}$
= (100 000$^{1.5}$+350 000$^{1.5}$)$^{1/1.5}$ = 384 784

Countrywide PML 2018 = Countrywide PML 500*(2018-2014)/8 + max(East Canada PML 420, West Canada PML 420)*(2022-2018)/8
= 384 784 * 4/8 + 262 000 * 4/8 = 323 392

Financial resources = capital & surplus allocated to EQ + EPR + reinsurance coverage + capital market financing = 400 000 * 10% + 25 000 + (100 000 * 50% + 150 000) + 0 = 265 000

ERC = Countrywide PML 2018 – Financial resources = 323 392 – 265 000 = 58 392

Earthquake Reserves = (ERC + EPR) * 1.25 = (58 392 + 25 000) * 1.25 = 104 240

Part b: 0.5 point

Sample 1
- Nature and adequacy of financial resources
- Identification and assessment of PML factors

Sample 2
- The risk appetite and the risk tolerance of the company
- The data management framework

Sample 3
- Document model assumptions, methods and limitation
- Document data management

Sample 4
- Calculation of PML factors
- Contingency plans supporting the risk

Sample 5
- Monitoring of concentration of exposures
- Models limitation and non-modelled risks

EXAMINER'S REPORT

Candidates were expected to demonstrate knowledge of the earthquake reserve calculation and earthquake exposure risk management policies and procedures documentation.

Part a

Candidates were expected to know how to calculate the earthquake reserves.

Common errors included:
- Not adding the EPR into the financial resources
- Misestimating the PML 500 and PML 250 part of the PML 420 calculation

Part b

Candidates were expected to identify two elements that the earthquake exposure risk management policies and procedures should document.

A common error included:
- Describing only one element

QUESTION 18	
TOTAL POINT VALUE: 2.25	LEARNING OBJECTIVE(S): C1
SAMPLE ANSWERS	

Sample 1

For AY 2017:

Beginning Unpaid Claims & Adjustment Expenses = 189,000 – 26,000 = 163,000

Ending Unpaid Claims & Adjustment Expenses = 195,000 – 65,000 = 130,000

Incremental Paid$_{2018}$ = 65,000 – 26,000 = 39,000

Net Investment Income from Insurance Operations:

Avg. Net UCAE = (184,500 + 179,000 – 16,500 – 16,000) / 2 = 165,500

Avg. Net UPR = (60,000 + 58,000 – 6,000 – 5,800) / 2 = 53,100

Avg. Premium Deficiency = 0

Avg. Unearned Commissions = (1,250 + 1,100) / 2 = 1,175

Avg. DPAE = (9,000 + 8,700) / 2 = 8,850

Avg. Receivables = (40,000 + 35,000) / 2 = 37,500

5,200 = Inv. Yield * (165,500 + 53,100 + 0 + 1,175 – 8,850 – 37,500)

Inv. Yield = 3.0%

Investment Income for AY 2017 in 2018 = 3.0% * (163,000 + 130,000) / 2

= 4,395

Discounted Excess/Deficiency Ratio = $\frac{(163,000 - 130,000 - 39,000 + 4,395)}{163,000}$

= -0.99% (Deficiency of 0.99%)

Sample 2

Net Investment Income = yield rate * [sum (A) – sum (B)] = 5,200

Sum (A) = 59,000 + 181,750 + 1,175 + 0 = 241,925

Sum (B) = 5,900 + 16,250 + 8,850 + 37,500 = 68,500

Yield Rate = 5,200 / 173,425

Yield rate = 2.998%

APV of Net Unpaid for AY 2017 at 12 months = 163,000

APV of Net Unpaid for AY 2017 at 24 months = 130,000

Investment Income = 2.998% * 0.5 * (163,00 + 130,000) = 4,393

Deficiency Ratio = (189,000 – 195,000 + 4,393) / 163,000 = -0.986%

Sample 3

Net Investment Income from Insurance Operations = [(60,000 – 6,000) + (58,000 – 5,800) + (184,500 – 16,500) + (179,000 – 16,000) + 1,250 + 1,100 + 0 – 9,000 – 8,700 – 40,000 – 35,000] * ½ * yield

173,425 * yield = 5,200

Yield = 3%
Cumulative discounted excess/deficiency ratio = [163,000 – 130,000 – 39,000 + .5 * 3% *
(163,000 + 130,000)] / 163,000
= -0.986%

EXAMINER'S REPORT

Candidates were expected to calculate the cumulative discounted excess/deficiency ratio using the information provided. Candidates were also expected to use the correct formula for investment yield based on the fact that net investment income from insurance operations is less than the net income plus share of net income (loss) of pooled funds using the equity method.

Common errors included:
- Using the incorrect formula for investment yield
- Mistaking net ultimate losses for net unpaid losses
- Using cumulative paid losses instead of incremental paid losses to determine the excess/deficiency
- Using the only the ending balance sheet values instead of the average of beginning and ending values to determine investable assets
- Using gross average unpaid losses and unearned premiums instead of net

QUESTION 19	
TOTAL POINT VALUE: 5.25	LEARNING OBJECTIVE(S): C2
SAMPLE ANSWERS	

Sample
Capital available

$$= 15,500 + 18,100 - 2,200 + 2,500 + 1,000 + 4,500 - 3,600 + 7,500 + 3000$$
$$= 46,300$$

(the deductions are for goodwill and intangible assets and deferred tax assets)

Check if Cat B+C exceeds the cap: $0.4(46,300 - AOCI) = 16,720 > 7,500 + 3,000$ (it's fine)
Check if Cat C exceeds the cap: $0.07(46,300 - AOCI) = 2,926 < 3,000$ (cap at 2,926)
Hence *capital available* $= 46,300 - (3,000 - 2,926) = 46,226$

For market risk

$$Duration\ of\ asset = \frac{4 * 12,300 + 3 * 7,000}{19,300} = 3.637$$

$$Duration\ of\ liab = \frac{1.5 * 8,000 + 1.75 * 13,500}{21,500} = 1.6569$$

Interest rate risk margin $= |3.637 * 19,300 - 1.6569 * 21,500| * 0.0125 = 432.1344$
Total market risk margin

$$= Interest\ risk\ margin + FE\ risk\ margin + EQ\ risk\ margin$$
$$+ Real\ est.risk\ margin = 1,782$$

I + M + C = 36,282

For operational risk
$Cap = 30\% * (I + M + C) = 10,884$
- Component # 1 : $8.5\% * (I + M + C) = 3,083.9$
- Component # 2 : $2.5\% * P_w = 1,275$
- Component # 3 : $2.5\% * P_c = 132.5$
- Component # 4 : $1.75\% * P_a = 336$
- Component # 5 : $2.5\% * P_\Delta = 2.5\% * [(51,000 + 19,200) - 1.2 * (34,000 + 12,500)]$

Operational risk margin $= \min(10,884\ ;\ 5,187) = 5,187$

For Diversification credit
$DC = I + A - \sqrt{I^2 + A^2 + 2RAI}$ (R = 0.5; $A = M + C = 6,782$; I = 29,500)
$DC = 2,870.75$

Hence, capital required at target $= I + M + C + O - DC = 36,282 + 5,187 - 2871 = 38,598$

$MCT = \frac{Capital\ available}{Capital\ required} * 1.5 = 179.64\% > 150\%$ (meets supervisory target expectations)

SAMPLE ANSWERS AND EXAMINER'S REPORT

EXAMINER'S REPORT
Candidates were expected to calculate the Minimum Capital Test (MCT) and assess whether the calculated ratio meets OSFI's supervisory target expectations. This includes the calculation of capital available, capital required for market risk and operational risk, diversification credit, and the ratio itself. Common errors included: • Not commenting on financial condition through a comparison of the MCT ratio against the supervisory target • Not considering goodwill and deferred tax assets as deductions to capital available • Not computing the limit of capital of category C and B+C

QUESTION 20	
TOTAL POINT VALUE: 3.75	LEARNING OBJECTIVE(S): C2
SAMPLE ANSWERS	

Part a: 0.5 point

Sample answers (two of the following)
- Risk identification and control
- To complement other risk management tools
- Support capital management
- Improve liquidity management
- To evaluate the financial condition of the company
- Aid in setting internal capital targets

Part b: 0.5 point

Sample 1

Determine how far risk factors need to change to result in negative surplus, then determine if the change is plausible. Can help select the plausible adverse scenarios for DCAT.

Sample 2

Reverse stress testing is done by identifying scenarios that would adversely affect the company, such as causing surplus to be negative. Done by changing risk factors and then assessing whether or not such scenarios are plausible.

Part c: 2.25 points

Sample 1

Plausible adverse scenario: use 96th percentile => Gross Cat Loss = 605,000

With excess of loss reinsurance: Net Cat Loss = 605,000 – 400,000 – 150,000 = 55,000

PV(Unpaid Cat Loss) = 55,000 x 0.4 x $1.03^{-0.5}$ = 21,677

CapReq(Unpaid Cat Claims) = (net APV(Unpaid Claims) – pfads) x risk factor

$$= 21,677 \times 15\% = 3,252$$

CapReq(Unpaid Claims, adverse) = 12,750 + 3,252 = 16,002

CapReq(Insurance Risk) = 1,800 + 16,002 + 300 = 18,102

CapReq(Market Risk) = 1,700 + 1,600 + 450 = 3,800

CapReq(Credit Risk) = 700 + 100 = 800

A = 3,800 + 800 = 4,600

Diversification Credit = 4,600 + 18,102 – sqrt(4600^2 + 18102^2 + 2(0.5)(18,102)(600))

$$= 1,915$$

Target Capital Required = 4,600 + 18,102 + 4,300 – 1,915 = 25,087

MCT Ratio = 27,000 / (25,087/1.5) = 161%

Sample 2

Plausible scenario => between 95th and 99th => 96th percentile

Cat Loss = 605,000

150,00 ceded to reins A

400,000 ceded to reins B

55,000 retained by insurer

60% pay in 2019, 40% pay in 2020

$PV(@3\%) = 0.6(1.03)^{-0.5} + 0.4(1.03)^{-1.5} = 0.97385$
$PV(Cat) = 53,562$
Additional cap for unpaid = 53,562 x 0.15 = 8,034
Cap required for unpaid for adverse scenario = 12,750 + 8,034 = 20,784

Insurance Risk = 1,800 + 20,784 + 300 = 22,884
Asset Risk = 1,750 + 1,600 + 450 + 700 + 100 = 4,600
Target Capital = $4,300 + sqrt(22884^2 + 4,600^2 + 22,884 \times 4,600) = 29,797$

MCT = 27,000 / (29,797/1.5) = 135.9%

Part d: 0.5 point

Sample 1
It will increase the insurance risk as unpaid claim risk increases. Thus, MCT will decrease.

Sample 2
Capital available would go down. Credit risk would increase, which would increase the capital required. MCT ratio would go down.

EXAMINER'S REPORT

Candidates were expected to understand aspects of the DCAT process including stress testing, reverse stress testing, and the impact of scenario testing to the capital ratio.

Part a

Candidates were expected to be able to describe the purposes of stress testing.

There were no common errors identified.

Part b

Candidates were expected to define reverse stress testing and relate this testing to the DCAT analysis.

A common error included:
- Failing to mention how reverse stress testing can help the insurer with its DCAT analysis.

Part c

Candidates were expected to calculate the MCT ratio under the conditions of the plausible adverse scenario.

Regrettably, there was a typographical error in this part of the question; the calculation year was misstated as 2018 when it was intended to be 2019. Given this error, multiple interpretations of discounting and payment patterns were accepted.

Common errors included:
- Including MfADs in the calculation
- Failing to account for the capital required under the base scenario
- Failing to calculate the net cat losses under the adverse scenario correctly
- Failing to incorporate the payment pattern to obtain the correct discounted unpaid claims liability
- Failing to include all components in calculating Insurance, Market, Credit risk, or errors while calculating the Diversification Credit

Part d

Candidates were expected to interpret how the MCT ratio would change under an additional adverse scenario.

A common error included:
- Concluding the MCT ratio would increase

QUESTION 21	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): C2**
SAMPLE ANSWERS	

Part a: 0.5 point

Sample

The insurer's financial condition is satisfactory because:

- Base scenario > 150% for all the forecast period
- Base scenario and all plausible adverse scenarios have positive equity

Part b: 1.5 points

Sample 1

i. The capital available decreases because the drop in the value of the common shares portfolio decreases the total assets and the equity.
ii. The capital required for market risk decreases because the equity risk margin decreases due to the decrease in the value of common shares portfolio.
iii. The capital required for operational risk decreases because it depends on the market risk and the market risk decreases.

Sample 2

i. The capital available decreases because the drop in the value of the common shares portfolio decreases the total comprehensive income, which leads to a decline in the equity.
ii. The capital required for market risk decreases because it includes a risk margin based on the common share portfolio value.
iii. The capital required for operational risk decreases because both the formula and the cap decrease due to the market risk margin decrease.

EXAMINER'S REPORT

Candidates were expected to demonstrate knowledge of the requirements for financial condition to be satisfactory based on DCAT results and the impact of a scenario on different MCT components.

Part a

Candidates were expected to know how to assess the financial condition of a company based on the DCAT analysis results.

There were no common errors.

Part b

Candidates were expected to demonstrate knowledge of the impact of a specific adverse scenario on different MCT components.

Common errors included:

- Mistakenly assuming that the decline in stock market would impact the stock issued by the company

- Answering the capital required for market risk would increase

- Only considering the impact on the capped value of operational risk and not describing an impact if the capital required for operational risk was under the cap
- Only considering the impact on the operational risk margin formula and not describing an impact if the capital required for operational risk was capped and remain capped

QUESTION 22	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVE(S): C2**
SAMPLE ANSWERS	

Part a: 0.5 point

Sample 1
ORSA is an internal capital assessment procedure that is tailored to an insurer's own risk appetite and risk profile. It takes into account risks that are relevant to the insurer and helps the insurer develop and assess its internal capital target.

Sample 2
ORSA considers all risks specific to the insurer and helps management relate risk profile to capital. Setting the internal target is part of the ORSA. It's based on business scale and complexity of the insurer.

Sample 3
Use ORSA to set internal capital target based on insurer's own risk profile. Relate risk to capital based on nature, scale and complexity of the risk to assign capital to each risk category.

Part b: 1.5 points

i) Cyber Risk
Sample 1
Cyber risk is not accounted for in the MCT calculation. It should be considered in the company's internal capital target as the company is exposed to cyber risk from the new technology used in selling products through a mobile application.

Sample 2
Cyber risk is accounted for in the MCT as an insurance risk if it is a product underwritten by the company. Otherwise, if as a systematic risk to the insurer, it's not included. It should be accounted for in the company's internal target because the company's products are sold through sophisticated technology.

Sample 3
Cyber risk could be accounted for in the MCT as part of operational risk. The company should include it in internal targets because of the mobile app distribution.

ii) Interest Rate Risk
Sample 1
Interest rate risk is included in the MCT under market risk. It should be included in the company's internal target since government bonds are interest rate sensitive.

Sample 2
Interest rate risk is accounted for in the MCT and should be accounted for in the company's internal capital target because the discounted liabilities and the government bonds are affected by changing interest rates.

iii) Geographical Diversification
Sample 1
Geographical diversification is not accounted for in the MCT calculation. It should be considered in the internal capital target since the company operates in multiple provinces.

Sample 2
Geographical Diversification is partially included in the MCT in the catastrophe earthquake component; but is not part of the diversification credit, which is only for insurance vs asset risk. It should be included in the company's internal target, since they operate in many provinces.

EXAMINER'S REPORT

Candidates were expected to understand how the ORSA, internal target and MCT are related, and how they differ.

Part a

Candidates were expected to understand how insurers use the ORSA process to assess risks that are material to their own risk profile and then relate the assessed risk to capital through determining an internal capital target.

Common errors included:
- Only discussing the ORSA process without relating it to the internal targets
- Simply stating that ORSA can be used to set internal targets without relating the target selection to the insurer's own risk

Part b

Candidates were expected to understand which risks are incorporated into the MCT formula and which should be recognized in the internal target.

Common errors included:
- For each risk, stating situations in which each item should be included in a company's internal target without relating the decisions to the situation of the company described.
- For each risk, simply stating the risk is company-specific risk, without relating the answer to the company described.
- For each risk, stating that the risk should be included in the internal capital target because all risks should be considered.
- For interest rate risk, stating that the risk should be included in the internal target because it is already part of the MCT.
- For geographical diversification, stating it is included in the MCT as part of the diversification credit without clearly relating the answer to the earthquake component of the catastrophe risk.

QUESTION 23	
TOTAL POINT VALUE: 3	**LEARNING OBJECTIVE: C2**
SAMPLE ANSWERS	
Part a: 2 points	

Sample 1

i. RoR = Net income before taxes / GWP
    = (UW income + Net Investment Income) / (Direct Written Premiums + Assumed Written Premiums) = (17 000 + 13 000) / (200 000 + 30 000) = 13.04%

ii. Net Loss Reserves = Unpaid Claims and Adjustments - Unpaid Claims and Adjustment Recoverable from Reinsurers = 380 000 – 140 000 = 220 000

    Equity = Prior Year Equity + Total Comprehensive Income of the Year – Dividends
    = (700 000 – 600 000) + 30 000 – 1 000 – 4 000 = 115 000

    Net Loss Reserves to Equity = Net Loss Reserves / Equity
    = 220 000 / 115 000 = 208.7%

iii. NWP = 200 000 + 30 000 – 80 000 = 150 000

    Total Net Liabilities = 650 000 – 70 000 – 140 000 = 440 000

    Overall Net Leverage = (Net Written Premiums + Total Net Liabilities) / Equity
    = (150 000 + 440 000) / 115 000 = 513.0%

iv. Investment Yield = 2 × (Net Investment Income + OCI) / (Prior Year Invested Assets + Current Year Invested Assets – Net Investment Income – OCI)
    = 2 × (17 000 + 30 000 – 23 000) / (380 000 + 350 000 – 17 000 – (30 000 – 23 000))
    = 6.8 %

Sample 2

i. RoR = Net income before taxes / GWP
    = (17 000 + 13 000) / (200 000 + 30 000) = 13.04%

ii. Net Loss Reserves = 380 000 – 140 000 = 220 000

    Equity = 100 000 + 30 000 – 4 000 – 1 000 = 115 000

    Net Loss Reserves to Equity = 220 000 / 115 000 = 208.7%

iii. Overall Net Leverage
    = ((200000+30000–80000) + (650000–70000–140000)) / 115000 = 513%

iv. Investment Yield = 2 × Net Investment Income / (Prior Year Invested Assets + Current Year Invested Assets – Net Investment Income)

= 2 × 17 000 / (380 000 + 350 000 − 17 000) = 4.8 % For the investment yield, both answers based on the MSA reading and the Annual Return were accepted.
Part b: 1 point
Sample 1 • RoR is 13.04% > 6.2% ok • Net Loss Reserves to Equity is 208.7% > 200% not ok • Overall Net Leverage is 513 % > 400% not ok Overall, the company is in poor financial position as it has good return but it may be exposed to financial distress if reserves are inadequate. *Sample 2* • RoR: 13.04% > 6.2% ok • Net Loss Reserves to Equity: 208.7% > 200% not ok • Overall Net Leverage: 513 % > 400% not ok Overall the company may be in poor financial condition because the company has good return but there is a risk for the solvency of the company if there are small deviations in outstanding reserves.
EXAMINER'S REPORT
Candidates were expected to demonstrate knowledge of the key financial indicators and how to use them to comment on the financial health of a company.
Part a
Candidates were expected to know how to calculate the key financial indicators and their components. Common errors included: • Using the Total Comprehensive Income as the Other Comprehensive Income • Not using Total Liabilities to calculate the Total Net Liabilities • Using the Total Assets instead of the Total Invested Assets to calculate the Investment Yield
Part b
Candidates were expected to demonstrate knowledge of the key financial indicators thresholds and their meanings A common error included: • Not recalling the required threshold

QUESTION 24	
TOTAL POINT VALUE: 1.25	**LEARNING OBJECTIVE(S): C2**
SAMPLE ANSWERS	

Part a: 1 point

Sample

$$NRC = 7,000 + \sqrt{20,000^2 + 30,000^2 + 10,000^2 + \left(\frac{12,500}{2}\right)^2 + \left(\frac{12,500}{2} + 75,000\right)^2 + 65,000^2 + 15,000^2}$$

$$= 118,761.46$$

$$BCAR = \frac{AC - NRC}{NRC} * 100 = 52.5$$

Part b: 0.25 point

Sample

It shows the statistical independence between different risks and shows it's mostly unlikely that all risks will reach their maximum values at the same time

EXAMINER'S REPORT

Candidates were expected to know how to calculate the A.M. Best's BCAR ratio and the meaning of its components.

Part a

Candidates were expected to know how to calculate the A.M. Best's BCAR.

Common mistakes included:
- Using $0.5 * B_4{}^2$ instead of $(0.5 * B_4)^2$
- Not multiplying by 100 when calculating BCAR score
- Only calculating NRC and forgetting to calculate BCAR

Part b

Candidates were expected to understand the purpose of the covariance adjustment in the BCAR formula.

A common error included:
- Stating that the purpose of the covariance adjustment is simply to account for the fact that the risks are not perfectly statistically independent without explaining that statistical independence means that all the risk components are unlikely to develop simultaneously.

QUESTION 25	
TOTAL POINT VALUE: 1	**LEARNING OBJECTIVE(S): C2**
SAMPLE ANSWERS	

Sample 1

Moody's:
- Uses stochastic cash flows to model economic capital
- Cash flows are projected until all liabilities are settled

Standard & Poor's:
- S&P focuses on evaluating insurer's ERM systems and internal capital models
- Uses a weighted average of S&P's formula and the client's model

Sample 2

Moody's:
- Simulates repeatedly from the distribution of each risk
- The required capital is set by a VaR or a TVaR for the aggregate loss distribution

Standard & Poor's:
- Emphasis on principle-based systems and ERM practices
- S&P reasons that well-managed insurers evaluate their capital needs more accurately than a rating agency can

EXAMINER'S REPORT

Candidates were expected to demonstrate knowledge of the models used by the credit rating agencies.

A common error included:
- Describing the A.M. Best model instead of the required model

QUESTION 26	
TOTAL POINT VALUE: 1.25	**LEARNING OBJECTIVE(S): C2**
SAMPLE ANSWERS	

Part a: 0.5 point

Sample 1
    i)   A catastrophic event in the area that the insurer has a high volume
    ii)   A court ruling to introduce cap on non-pecuniary damage for minor injury

Sample 2
    i)   Unfavourable court decision
    ii)   Unexpected withdrawal of a big competitor

Sample 3
    i)   Catastrophes
    ii)   Court awards

Part b: 0.75 point

Sample 1
-    An insurer identifying ENID likely viewed favourably by regulator
-    "Blue Sky Thinking" in the process will give participants a different perspective/view of the company and is likely to provide more insight
-    Provide a basis for the frequency-severity approach

Sample 2
-    Viewed favourably by regulators
-    Use as a basis in frequency/severity approach to calculate load in ENID
-    Frequency/severity method could be used as check for other methods such as truncated distribution method.

EXAMINER'S REPORT

Candidates were expected to understand the concept of an event not in data (ENID) including identifying typical events and describing the benefits of the identification process.

Part a

Candidates were expected to provide typical examples of ENIDs.

There were no common errors on this part.

Part b

Candidates were expected to describe the benefits of the ENID identification process.

A common error included:
- Equating the process of calculating the ENID loading to that of the DCAT process and thus, providing the advantages of DCAT instead of the benefits of ENID identification.

QUESTION 27	
TOTAL POINT VALUE: 2.5	**LEARNING OBJECTIVE(S): D1**
SAMPLE ANSWERS	

Part a: 1 point

Sample 1
- Longer contracts require higher risk adjustments
- Risks with wider probability distributions require higher risk adjustments
- Less knowledge about current estimate and trend requires a higher risk adjustment
- High severity, low frequency events/risks require a higher risk adjustment

Sample 2
- Should be higher when less information is known
- Should be higher for low frequency, high severity risks
- Should be higher for longer term contracts
- Should be higher for risks with higher volatility

Sample 3
- Amount of uncertainty in the estimate -> select higher
- If low frequency, high severity -> select higher
- If policy term > 1 year -> select higher
- If loss distribution is wide -> select higher

Part b: 0.5 point

Sample 1
- If IFRS 17, do not have to discount LRC if coverage period < 1 year or for longer coverage periods where the effect of discounting is not significant. Canadian ASOP requires taking into account the time value of money
- For IFRS 17, If PAA is used for LRC, no need to account / adjust for time value of money and other financial risks for LIC liabilities if LIC cash flows are expected to be paid / received within 1 year from date claims are incurred. For CSOP, need to account for it.

Sample 2
- IFRS 17 does not depend on the assets that support the liability and also the assumptions on reinvestment while current practice does
- IFRS 17 discount rate is to reflect the characteristic of the liability (timing, currency) while the current practice does not look into these characteristics

Part c: 1 point

Sample 1
- Bottom-up approach – take risk-free yield curve and add illiquidity premium
- Top-down approach – can take portfolio of assets similar to liability (e.g. 10-year spot rate on Canadian bonds) and remove all characteristics not relevant to liabilities in question.

Sample 2

- Bottom-up approach: Select a risk-free yield curve, then make liquidity adjustments (e.g. adding liquidity premium)
- Top-down approach – select a portfolio with similar characteristics as insurer's liability portfolio, then make adjustment to remove anything not related to insurance contracts

Sample 3
- Bottom-up – adjust risk free rate by adding illiquidity premium to reflect the characteristics of liability cash flow expected
- Top-down – using reference portfolio of assets with similar characteristics to the liabilities. Then remove asset characteristics from the yield curve that are not relevant to liabilities.

EXAMINER'S REPORT
Candidates were expected to know the different treatment of risk adjustment and discounting under the current Canadian Standard of Practice and IFRS 17.

Part a
Candidates were expected to know how the risk adjustment for non-financial risk is determined under IFRS 17. A common error included: • Describing the general principles of IFRS 17 rather than those specific to estimating the risk adjustment for non-financial risk

Part b
Candidates were expected to understand the different treatment of discounting between the Canadian actuarial standards of practice and IFRS 17. Common errors included: • Stating that the current Canadian Standards of Practice requires a fixed discount rate • Stating that IFRS 17 does not require discounting without mentioning the specific scenario under which this is not required • Describing the two methods of selecting the discount rate instead of comparing the different treatment under the two standards

Part c
Candidates were expected to understand how discount rates are selected under IFRS 17. Common errors included: • Providing an incorrect method name • Identifying the method name but not describing the method

QUESTION 28	
TOTAL POINT VALUE: 1.25	**LEARNING OBJECTIVE(S): D1**
SAMPLE ANSWERS	

Part a: 0.5 point

Sample 1

Could use the portfolio yield rate which represents the IRR such that PV (all CFs) is equal to book value currently of portfolio

Sample 2

Use the weighted average of effective yield of bonds/shares where the weights = book value * modified or effective duration

Part b: 0.75 point

Sample
- Risk-free rate
- Discount rate used by assuming company
- Discount rate used for <u>net</u> policy liabilities

EXAMINER'S REPORT

Candidates were expected to demonstrate general knowledge about discounting net claim and policy liabilities ceded to reinsurers.

Part a

Candidates were expected to describe one approach to calculate the discount rate for net claim liabilities.

A common error included:
- Simply stating "portfolio yield rate" without giving any further description of the method

Part b

Candidates were expected to identify various acceptable ways to select the discount rate for ceded policy liabilities.

A common error included:
- Stating the discount rate selected for calculating gross policy liabilities could be used instead of that for net policy liabilities

QUESTION 29	
TOTAL POINT VALUE: 3.25	**LEARNING OBJECTIVE(S): D1**
SAMPLE ANSWERS	

Part a: 1 point

Sample 1

- Has at least 3 years of Canadian experience in the past 6 years with one year in valuation
- Has experience with Canadian legislation and regulation
- Up-to-date in continued professional development
- Doesn't have adverse findings in CIA disciplinary tribunal

Sample 2

- 6 years in the past, 3 years of Canadian experience with 1 year valuation
- Meet professional development requirement
- No adverse findings in disciplinary tribunal
- Experience in SOP

Part b: 0.75 point

Sample 1

- Assess insurer financial health and soundness
- Give confidence in AA's work with the regulators and the public
- Give independent advice to the AA

Sample 2

- Assist OSFI to assess a company's financial soundness and safety
- Assist AA with professional advice
- Provide confidence to the public, regulators & shareholders

Sample 3

- Help OSFI assess safety and soundness of AA's work
- Improve AA's work by providing professional education
- Enhance public confidence of AA's work (regulator, policyholder, creditor)

Sample 4

- Build public trust in insurer competence
- Assist AA and give guidance on ways to improve
- Assist OSFI in assessing financial condition of insurers

Part c: 0.75 point

Sample 1

- Review if the AA used accepted actuarial principles
- Review assumptions and methods
- Review internal and external changes to the insurer

Sample 2

SAMPLE ANSWERS AND EXAMINER'S REPORT

- Validation of assumptions and methods used in DCAT
- That the AA followed accepted actuarial practice
- That the AA documented assumptions and methods

Part d: 0.75 point

Sample 1
- System change
- Valuation assumption change
- Valuation method change

Sample 2
- Change in valuation methodologies
- Change in claim handling practice
- Court decision regarding liability payout

Sample 3
- Rapid growth in the company
- Catastrophe event
- Change to the valuation calculation software

Sample 4
- Change in systems (valuation software)
- Change in material external event (inflation)
- Change in valuation assumptions (LDFs)

Sample 5
- Changes in management or management practices
- Changes in software used for valuations
- Any changes in the insurance landscape due to legal decisions

EXAMINER'S REPORT

Candidates were expected to understand the professional responsibilities of the actuary with regard to the requirements to act as an Appointed Actuary (AA) in Canada and OSFI's expectations for peer review.

Part a

Candidates were expected to know the requirements to act as an AA in Canada.

Common errors included:
- Incomplete answers with respect to the experience qualification, for example, not indicating the 3 years of Canadian experience must be within the latest 6 years or not indicating 1 of which must be valuation experience.
- Stating that an FCAS is qualified to be AA in Canada

SAMPLE ANSWERS AND EXAMINER'S REPORT

Part b
Candidates were expected to understand what OSFI wants to achieve through peer review. Common errors included: • Describing OSFI's expectation of a full peer review instead of OSFI's objectives of peer review, that is, confusing part b. and part c. • Describing the frequency of peer review, not what OSFI wants to achieve through peer review • Repeating answers in different words

Part c
Candidates were expected to know the expected duties of the peer reviewer. Common errors included: • Describing OSFI's objectives of peer review instead of OSFI's expectation of a full peer review, that is, confusing part b. and part c. • Repeating answers in different words

Part d
Candidates were expected to understand three different categories of material changes and provide one example in each category. A common error included: • Providing two similar examples in the same category, for example, answers that are both covered under company operations

QUESTION 30	
TOTAL POINT VALUE: 1.5 points	**LEARNING OBJECTIVE(S): D1**
SAMPLE ANSWERS	

i. Severity of the failure of the model

Sample answers (any three of the following)

- Financial significance
- Importance of model
- Frequency of use
- Reputation risks

ii. Likelihood of model failure

Sample answers (any three of the following)

- Complexity of model
- Expertise of users
- Documentation of model
- Adequacy of testing
- Independence of creator and tester

EXAMINER'S REPORT

Candidates were expected to evaluate model risk exposure.

A common error included:

- Mixing up the criteria used to assess severity of model failure and likelihood of model failure

QUESTION 31	
TOTAL POINT VALUE: 1.5	**LEARNING OBJECTIVE(S): D1**
SAMPLE ANSWERS	

Part a: 0.5 point

Sample 1
- This is not a subsequent event (after report date)
- Since it is an error, if the event is material, amend or withdraw the report and reflect it in the new one

Sample 2
- Not a subsequent event
- Withdraw and amend report due to data error

Sample 3
- Actuary is informed after report date -> not a subsequent event
- Since the data issue is not material -> no action required

Sample 4
- Since small claims are not material, inform only

Part b: 0.5 point

Sample 1
- It is a subsequent event
- It would not make the entity different as it was at the calculation date
- The actuary should disclose the event but not make adjustment in the report

Sample 2
- Subsequent event
- Not an error
- Happened after calculation date
- Entity different after calculation date
- Purpose was to report as it was
- Inform if material

Part c: 0.5 point

Sample 1
- It is a subsequent event because AA became aware between the calculation date and the report date
- The AA should inform only, because the purpose is to report as it was at the calculation date.

Sample 2
- Subsequent event
- Not an error

- After calculation date
- Entity different after calculation date
- Purpose: report as it was
- Inform if material

Sample 3
- Subsequent event
- Does not change the value of entity as at Dec 31, 2018
- So disclose with notes

Sample 4
- It is a subsequent and will impact the company materially, but not retroactively
- So the actuary should disclose the event only

Sample 5
- Subsequent event since it's between Dec 31, 18 and Jan 20, 19
- Non adjusting, does not change company at calculation date
- Disclose in notes

EXAMINER'S REPORT

Candidates were expected to demonstrate an understanding of subsequent events in the context of specific scenarios and the logic that should be used by the AA to determine the appropriate course of action.

Part a

Candidates were expected to know that this is not a subsequent event and to explain the AA's course of action in this scenario.

Common errors included:
- Incorrectly identifying this event is a subsequent event
- Not providing the logic behind the course of action or not providing enough reasons to support the course of action
- Providing more than one course of action which are conflicting without clearly explaining the correct course of action.

Part b

Candidates were expected to know that this is a subsequent event and to explain the AA's course of action in this scenario.

Common errors included:
- Incorrectly identifying this event is not a subsequent event
- Only mentioning that the AA do not need to reflect in the work but without mentioning that the AA should still inform the users
- Not providing the logic behind the course of action or not providing enough reasons to support the course of action

Part c
Candidates were expected to know that this is a subsequent event and to explain the AA's course of action in this scenario. Common errors included: • Incorrectly identifying this event is not a subsequent event • Only mentioning that the AA does not need to reflect in the work but without mentioning that the AA should still inform the users • Not providing the logic behind the course of action or not providing enough reasons to support the course of action