#	total pts: 70	a	b	c	d	e
1	2.50	1.00	0.50	0.50	0.50	
2	1.00	0.25	0.25	0.25	0.25	
3	1.75	0.75	0.50	0.50		
4	3.00	0.50	1.50	1.00		
5	1.50	0.75	0.75			
6	2.50	0.50	0.50	1.00	0.50	
7	2.50	0.75	0.50	0.50	0.75	
8	3.50	1.25	0.25	1.00	1.00	
9	2.00	0.50	0.75	0.50	0.25	
10	1.00	1.00				
11	2.75	0.50	0.75	0.50	1.00	
12	4.00	3.00	1.00			
13	7.00	2.00	4.50	0.50		
14	2.00	1.25	0.75			
15	3.25	2.75	0.50			
16	2.25	2.25				
17	2.50	1.25	0.75	0.50		
18	1.50	0.75	0.75			
19	3.00	1.00	1.00	1.00		
20	1.25	0.50	0.50	0.25		
21	2.50	1.00	1.00	0.50		
22	2.00	0.50	0.50	1.00		
23	2.75	1.50	0.50	0.75		
24	2.00	1.50	0.50			
25	3.50	1.50	1.00	1.00		
26	2.00	1.50	0.50			
27	1.75	0.25	1.50			
28	2.75	1.00	1.00	0.75		

BattleActs Practice Exam
2019.Fall
6-Canada
slay the beast

      a.   (1 point)

        Identify 4 areas where the federal government has exclusive authority.

      b.   (0.5 points)

        Identify 2 areas where the provincial government has exclusive authority.

      c.   (0.5 points)

        Identify 2 matters under provincial insurance regulation.

      d.   (0.5 points)

        Identify 1 item under each matter listed in part (c).

Explain whether the following situations are permitted according to Ontario regulations.

a.   (0.25 points)

An insured purchased a new car. Their auto insurance premium increased.

b.   (0.25 points)

An insured was fired from their job. Their auto insurance decreased.

c.   (0.25 points)

An insurer used data from a Usage-Based Insurance program to investigate a suspicious claim.

d.   (0.25 points)

An insurer used data from a Usage-Based Insurance program to deny a suspicious claim.

      a.   (0.75 points)

      Identify 3 pieces of information that must be made available to the TNC and
      insurance providers after an accident where a a ride-sharing vehicle is involved.

      b.   (0.5 points)

      Describe a similarity between UBI and ride-sharing services.

      c.   (0.5 points)

      Describe a difference between UBI and ride-sharing services.

      a.   (0.5 points)

          Define the term "insurance contract" according to IFRS 17.

      b.   (1.5 points)

          Briefly describe the 3 building blocks of the measurement of insurance contract liabilities under IFRS 17.

      c.   (1 point)

          Identify 2 differences between IFRS 17 and current CIA practice regarding measurement of liabilities.

In each of the following scenarios, explain a likely outcome for the insurance company and cite any relevant precedents used to support the conclusion drawn.

a. (0.75 points)

An insured was driving his vehicle in BC when a group of car thieves shot and seriously injured him while attempting to take his vehicle. His auto policy states that he is entitled to no-fault benefits for an injury "that arises out of the ownership, use or operation of a vehicle." The insured argues that the insurance company should provide coverage as the injuries were causally connected to the use of the motor vehicle.

b. (0.75 points)

A man was injured in a head-on collision on an icy road on Markham Ontario. He claimed the city was liable for failing to maintain the roadway in good condition during a winter storm. The city claimed they had ploughed and salted the road in accordance with accepted city standards. They had cleared the snow & ice but it had reformed quickly due to the severity of the storm. The plaintiff sought 6 million dollars in damages.

a. (0.5 points)

Describe the Trilogy ruling.

b. (0.5 points)

Describe 2 reasons for the cap on general (non-pecuniary) damages.

c. (1 point)

Describe 3 exceptions to the cap on non-pecuniary damages <u>and</u> the Supreme Court's reason for the exceptions.

d. (0.5 points)

Describe the effect of the cap on equity between major and minor injuries.

An agricultural producer insures the production of corn under a plan with the
following details:

area of crop:	35 hectares
probable yield:	15,000 kg/ha
coverage level:	80%
insured price:	$0.26/kg

a.   (0.75 points)

Growing Forward 2 is a comprehensive federal-provincial-territorial framework for Canada's
agricultural sector. It consists of 6 Business Risk Management Programmes. Briefly describe
3 Business Risk Management Programmes that could protect this producer against crop
losses or a drop in the price of the crop.

b.   (0.5 points)

If the actual production of corn in a particular year is 330,000 kg, calculate the indemnity
paid to the producer.

c.   (0.5 points)

To calculate probable yield for insurance purposes, we normally use an average of
historical yields. Sometimes, however, historical yields need to be adjusted.
    i   What is the general purpose of such a historical adjustment?
    ii   Identify a specific reason for a historical adjustment.

d.   (0.75 points)

It is important for agricultural insurance to be self-sustainable.
    i   Define the term 'self-sustainability load'.
    ii   What is the statistical definition of 'self-sustainability'?

a.   (1.25 points)

Identify 5 minimum requirements for RSP transfer eligibility.

b.   (0.25 points)

In Ontario, why is only 85% of each risk transferred covered by the RSP.

c.   (1 point)

Compare and contrast FARM and RSPs with respect to:
   i   admission
   ii   participation ratio

d.   (1 point)

Given the following information, calculate the company's loss ratio on their share of the pool. Assume a provincial expense allowance (PEA) of: 27%

	company	province
direct earned **exposures** *not* ceded to the RSP	2,000	25,000
direct earned **premium** ceded to the RSP	40,000	750,000
total incurred **losses** ceded to the RSP	n/a	1,200,000

      a.   (0.5 points)

           Briefly describe how terrorism has changed in recent years.

      b.   (0.75 points)

           Briefly describe how terrorism is defined in Canada.

      c.   (0.5 points)

           Identify 2 considerations in assessing terrorism risk for a business.

      d.   (0.25 points)

           How is terrorism priced in Canada?

Exam: BattleActs 6C Practice Exam 2 (2019.Fall)   page 10
Question: 10
Points: 1.00 points

      a.   (1 point)

          According to "ICBC Affordable and effective auto insurance – A new road forward for British Columbia", identify 4 guiding principles of an effective auto insurance system.

     a.   (0.5 points)

        Identify 2 reasons that coverage for overland flooding has generally not
        been offered to residential customers in Canada.

     b.   (0.75 points)

        Identify 3 areas of government under-investment in risk planning and mitigation.

     c.   (0.5 points)

        Even when private flood insurance is widely available, what useful role can the
        government still provide in ensuring the availability & affordability of flood insurance.

     d.   (1 point)

        Briefly describe the U.K. approach to flood insurance. Your answer should cover 4 separate
        points.

a.   (3 points)

Determine the final A.M. Best rating for the following insurer.

		Required Capital Amounts			
asset risk		VaR 95	VaR 99	VaR 99.5	VaR 99.6
(B1)	Fixed income securities risk	190	246	266	270
(B2)	Equity securities risk	113	146	158	161
(B3)	Interest rate risk	116	150	162	165
(B4)	Credit risk	110	142	154	156
U/W risk					
(B5)	Reserve risk	700	1,049	1,187	1,231
(B6)	Premium risk	650	974	1,102	1,143
other risk					
(B7)	Business risk	49	49	49	49
(B8)	Catastrophe risk	100	124	185	226

Recap of Available Capital (AC)	amount
Reported Capital (surplus)	2,660
Equity adjustments *(lura)*	
loss reserves	95
unearned premium	-190
reinsurance	19
assets	0
Debt adjustments *(sd)*	
surplus notes	0
debt service requirements	0
Other adjustments *(fig)*	
future operating losses	0
intangibles	66.5
goodwill	66.5

b.   (1 point)

Identify 4 considerations other than BCAR score that impact balance sheet strength
assessment.

a. (2 points)

Given the following information, calculate the MCT capital available.

qualifying category A common shares	28,500
contributed surplus	2,000
Retained Earnings	6,500
reserves	2,500
AOCI	7,000
qualifying category B instruments	16,500
qualifying category C instruments	6,000
non-controlling interests	500

You'll also need some information on reinsurance ceded to <u>unregistered reinsurers</u>:

UEP ceded: ($) UnEarned Premiums ceded to assuming reinsurer
O/S Recov: ($) OutStanding losses Recoverable from assuming reinsurer
Reins Recv: ($) Reinsurance Receivable
Reins Pay: ($) Reinsurance Payable
NOD: ($) Non-Owned Deposits (RSA + Other) & includes FUNDS to secure pmt
                    from assuming insurer (the FUNDS inclusion is new for 2018)
LOC: ($) Letters Of Credit

UEP ceded	O/S Recov	Reins Recv	Reins Pay	NOD	LOC
15,000	5,000	2,000	9,000	8,000	6,000

b. (4.5 points)

Given the following information, calculate the MCT minimum capital required.

Line of Business	net unpaid *	margin
Line 1	49,000	13%
Line 2	77,000	10%

* net unpaid is discounted but excludes PfADs

Line of Business	prem liabs	margin	DWP (12 mths)	AWP (12 mths)	CWP (12 mths)
Line 1	15,000	18%	81,000	20,000	10,000
Line 2	60,000	16%	104,000	23,000	28,000

Question continues on next page…

Exam: BattleActs 6C Practice Exam 1 (2018.Fall)
Question: 13 *(continued)*

These 2 amounts relate to components of insurance risk:

capital required for unregistered reinsurers:	2,000
capital required for catastrophes:	5,000

The capital required for <u>interest rate</u> risk is:	3,000
The capital required for <u>foreign exchange</u> risk is:	1,000
The capital required for <u>equity</u> risk is:	4,500
The capital required for <u>real estate</u> risk is:	500
The capital required for <u>credit</u> risk is:	4,550

Here is some more information that you'll need:

AWP(ig):	($) AWP (last 12 mths) from intra-group pooling
CWP(ig):	($) CWP (last 12 mths) from intra-group pooling

DWP	AWP	CWP	growth	AWP(ig):	CWP(ig):
185,000	43,000	38,000	22%	0	0

	risk factor
DWP over last 12 months	2.50%
AWP over last 12 months	1.75%
CWP over last 12 months	2.50%
AWP(ig) over last 12 months	0.75%
CWP(ig) over last 12 months	0.75%
premium growth above 20%	2.50%
capital factor *	8.50%

* capital factor applies to total capital required BEFORE operational risk margin and diversification credit.

c. (0.5 point)

Calculate the MCT ratio and state whether it is above or below the supervisory target.

a.   (1.25 points)

Calculate the investment income attributable to insurance operations.

investment yield: 7%

AY	APV yr-end 14	APV yr-end 15	paid in CY 2015
2012	3,000	2,000	800
2013	4,000	3,000	900
2014	4,500	3,500	1,000
2015		4,500	4,000

	yr-end 14	yr-end 15	
UPR	5,000	6,000	<== unearned premium reserve
PDR	600	400	<== premium deficiency reserve
UEcomm	1,200	900	<== unearned commissions
PH Recv	300	100	<== policy holder receivables (agents & brokers)

b.   (0.75 points)

Calculate the excess (deficiency) **amount** for CY 2015 (not the ratio).

Suppose you're given the following information

BALANCE SHEET

	current (1)	prior (0)
Cash	7,800	5,800
Bonds and Debentures	58,300	63,500
Common Shares	4,500	3,400
Real Estate	19,600	23,900
Agents and Brokers Receivables	700	1,200
Unearned Premiums Recoverable	17,100	16,900
Unpaid Claims and Adjustment Expenses Recoverable	?	?
Total Assets	181,100	163,100
Gross Unpaid Claims and Adjustment Expenses	63,400	56,600
Equity	50,300	42,200

INCOME STATEMENT

	current (1)	prior (0)
Net Premiums Written	69,000	79,600
Decrease in Net Unearned Premiums	1,800	1,600
Net **Claims** and Adjustment Expenses	60,400	48,700
Total Acquisition Expenses	7,200	8,100
General Expenses	4,500	5,100
Investment Income	10,000	6,100
Realized Gains	-1,700	800
Investment Expenses	800	600
Income Taxes – Total	4,000	4,100

ALSO:

Net Leverage Ratio *(at end of current year)* :	220%	n/a

a.   (2.75 points)

Calculate these quantities and assess the financial health of the company.

(i)   InvYld (Investment Yield)   (iii)   ROA

(ii)   ROE   (iv)   Net U/W Leverage Ratio

b.   (0.5 point)

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

a.   (2.25 points)

Given the following information, calculate the TOTAL NET COMMISSIONS. Note that I've used abbreviations in the table so the table would fit in the width of the page.

DFcomm: Deferred Commissions   **@ start:** at start of year
UEcomm: Unearned Commissions   **@ end:** at end of year

LOB	(02) DFcomm @ start	(03) UEcomm @ start	(04) Direct	(05) Assm'd	(06) Ceded	(07) Net	(08) DFcomm @ end	(09) UEcomm @ end	(10) Net Comm
			commissions in respect of WP						
1	1,200		1,100	150	500		2,200		
2	1,700		1,200		300	1,000	1,700		
Tot	2,900		2,300		800		3,900		

gross contingent commissions	800
ceded contingent commissions	200
gross other non-deferrable commissions	400
ceded other non-deferrable commissions	75
ceded commission income (LOB1 + LOB2)	1,400

a.   (1.25 points)

Calculate the earthquake reserve using the model method with phase-in. *(EPR is the earthquake premium reserve.)*

Year	2020
deductible	20,000

EastCan.PML.500	60,000
WestCan.PML.500	240,000

EastCan.PML.420	30,000
WestCan.PML.420	120,000

EPR	29,600
Financial Resources	55,000

EastCan.**PTIV**	46,800
WestCan.**PTIV**	196,800

b.   (0.75 points)

Identify and briefly describe 3 principles of earthquake risk management.

c.   (0.5 points)

Identify and briefly describe 2 sound earthquake modeling practices.

For each of the following scenarios, evaluate whether risk transfer has occurred and briefly explain your answer. Your explanation may be either qualitative or quantitative as appropriate.

a.   (0.75 points)

A risk manager purchases an annual 90% quota-share policy for $1,500,000. The portfolio contains 150 policies. The individual loss distribution is given in the table below:

probability of loss	severity of loss
90%	0
10%	15,000

b.   (0.75 points)

A risk manager purchases a policy with the following terms:

premium: 1,000
probability of loss: 6%
expected severity: 150   *(net of premium)*

a.   (1 point)

Given the following information about Company A and Company B, explain whether the appointed actuary can conclude whether each company is in good financial condition.

Company A	Metric	2019	2020	2021
Base Scenario	MCT Ratio	150%	175%	200%
	Capital *(000s)*	10,000	15,000	20,000
Adverse Scenario	MCT Ratio	120%	150%	155%
	Capital *(000s)*	5,000	10,000	15,000

Company B	Metric	2019	2020	2021
Base Scenario	MCT Ratio	160%	150%	140%
	Capital *(000s)*	2,000	1,000	300
Adverse Scenario	MCT Ratio	150%	135%	95%
	Capital *(000s)*	10,000	10,000	10,000

b.   (1 point)

Define the following terms:
    i   plausible adverse scenario
    ii   reverse stress testing

c.   (1 point)

Suppose the adverse scenario in Company B is investment risk and results in a significant decrease in the value of the company's portfolio. Identify 2 possible ripple effects and 2 possible management actions.

a.   (0.5 points)

Calculate the maximum allowable DPAE and the PDR (if any.)

net UPR	72,890
FutRe	5,960
ELR	85%
ULAE	2,320

discount rate	5.5%
MfAD(inv)	75 bps
MfAD(claims)	10.0%
MfAD(re)	10.0%

APV	58,846

gross (PV+LAE)	62,590
maintenance	3,680
UEComm	1,130

b.   (0.5 points)

Identify the purpose of DPAE and whether it is classified as an asset or a liability.

c.   (0.25 points)

Identify 1 example of a DPAE.

a.   (1 point)

Identify the steps in a natural catastrophe stress test.

b.   (1 point)

Identify the elements of strong cat risk management according to A.M. Best.

c.   (0.5 points)

Identify a conceptual difference between MCT and BCAR regarding the time horizon.

a.   (0.5 points)

Identify 2 considerations in determining concentration risk of an insurer.

b.   (0.5 points)

Briefly describe the 2 approaches which account for the time value of money when evaluating the runoff of claims liabilities.

c.   (1 point)

Identify 4 considerations in determining the interest rate used to discount policy liabilities.

a.   (1.5 points)

Solvency II is a principles-based insurance regulatory system for capital levels of
insurance companies in the European Union. Identify and briefly describe the 3 pillars
of Solvency II.

b.   (0.5 points)

ENID *(Events Not in Data)* are often described as high-severity, low-probability events
not reflected in historical data.

According to the Institute & Faculty of Actuaries reading, "Solvency II Technical Provisions
for General Insurers", what is the **proposed** definition of ENID.
*(This definition is sometimes referred to as the **purpose** of ENID.)*

c.   (0.75 points)

Identify 3 ways ENIDs may be identified.

a.   (1.5 points)

Describe 3 key elements of ORSA.

b.   (0.5 points)

Identify a way that ORSA is a better management tool than MCT.

a.   (1.5 points)

According to the CIA paper on modeling, identify and briefly describe the 3 elements a model should contain.

b.   (1 point)

Identify and briefly describe the 4 steps in validating a newly created model.

c.   (1 point)

Given the following information, use the 2-dimensional model risk rating system to evaluate the overall model risk.

task: forecast capital requirements on a quarterly basis
method: use a brand new untested model of high complexity

model risk considerations:
  - capital requirements are significant
  - model is used frequently
  - there is no documentation for the model
  - a summer intern with no prior actuarial experience is running the model

Question: 26
Points: 2.00   points

       a.   (1.5 points)

           Identify and briefly describe 2 items that should be included in a Risk Appetite Framework.

       b.   (0.5 points)

           Identify 2 elements of good corporate governance.

a.   (0.25 points)

Define the term 'subsequent event'.

b.   (1.5 points)

The Appointed Actuary of a property and casualty insurance company is valuing policy
liabilities as at December 31, 2019. The report date is February 22, 2020. For each of
the following scenarios, briefly discuss the actions that the Appointed Actuary should take.

i   A insurance company's reinsurer became insolvent on Jan 15. The primary
       insurer's actuary became aware on Jan 16.

ii   The stock market suffered a 10% drop in value on Jan 5. The actuary became
       aware on the same day.

iii   A severe winter storm occurred on Jan 19. The actuary became aware
       on Jan 21.

a.   (1 point)

Identify 4 of the legal requirements surrounding the appointment of the Appointed Actuary.
(Note that this is <u>different</u> from the **qualifications** *required of the AA.)*

b.   (1 point)

Briefly describe 4 roles or duties of the Appointed Actuary (AA).

c.   (0.75 points)

Identify 3 objectives of a peer review.

Exam: BattleActs 6C Practice Exam 2 (2019.Fall) - **[ANSWER SHEET]**   page 30
Answer: 1
Points: 2.50 points

Source: McD.Intro

(1 point)   a.   Any 4 of: *(there may be others - I've only listed items from the wiki)*
     - regulation of trade & commerce
     - taxation
     - banking
     - bankruptcy & insolvency
     - aliens & naturalization
     - criminal law

(0.5 points)   b.   Any 2 of: *(there may be others - I've only listed items from the wiki)*
     - provincial taxes
     - civil property rights
     - hiring & supervising provincial employees
     - operating jails & hospitals

(0.5 points)   c.   - contract matters
     - transaction matters

(0.5 points)   d.   For <u>contract matters</u>, any 1 of: *(there may be others - I've only listed items from the wiki)*
     - policy contents
     - policy terms *(includes effective date)*
     - premium payment
     - insurable interest
     - reinstatement
     - designation of beneficiaries

     For <u>transaction matters</u>, any 1 of:
     Agent licensing
     Unfair practices
     Claims handling

Answer: 2
Points: 1.00   points

Source: FSCO.PPA, FSCO.UBI

(0.25 points)   a.   **Permitted.**
      - premium can be based on the value of a car

(0.5 points)   b.   **Permitted.**
      - the insurer **cannot** use employment status, but this situation could still be allowed if
        the premium adjustment (decrease) is based on the insured driving fewer miles by not
        having to drive to work

(0.25 points)   c.   **Permitted.** *(based on new version of syllabus reading)*
      - the current version of the FSCO.UBI syllabus reading **does** permit investigation of claims
        based on UBI data (the previous version did not)

(0.25 points)   d.   **Permitted.** *(based on new version of syllabus reading)*
      - fraud prevention is permitted so if the insurer used UBI to determine a claim is
        fraudulent, they should be permitted to deny the claim

Answer: 3
Points: 1.75   points

Source: AB.TNC, FSCO.UBI

(0.75 points)   a.   accident information:
                        - date/time of accident
                        - circumstances of accident
                       electronic information:
                        - times when driver was logged in/out to the TNC app

(0.5 points)   b.   both require new technology
                        - UBI requires a device to be installed in your car
                        - ride-sharing a smart-phone to connect drivers & customers
                       (there are probably also other valid answers)

(0.5 points)   c.   - UBI affects a customer's premiums for <u>traditional</u> auto policies
                       - ride-sharing is a <u>new type</u> of insurance policy to cover the use of personal vehicles to
                         carry paying customers

Source: IFRS 17

(0.5 points)   a.   *You really should memorize this* ***exactly*** *as given* :
                        a **contract** under which 1 party (the issuer)…
                        accepts significant insurance risk from another party (the policyholder)…
                        by **agreeing** to compensate the policyholder…
                        if a specified uncertain future event (the insured event) adversely affects the policyholder

(1.5 points)   b.   Hint: **PV-risk-CSM**
                    1. **P**resent **V**alue of future cash flows
                        - similar to PV(liabilities) (includes acquisition expenses and all premiums,
                          excludes financial risk)
                    2. **risk** adjustment for non-financial risk
                        - similar to PfADs for non-economic risk (claims development, reinsurance recovery)
                    3. **C**ontractual **S**ervice **M**argin (CSM)
                        - represents unearned profit from a group of insurance contracts (so no front-ending
                          of profits)
                        (new concept in IFRS 17 – current CIA standards do allow front-ending of profits)

(1 point)   c.   *Any 2 of:*
                    criteria:
                     IFRS 17: allows PAA for short-term contracts without testing whether PAA reasonably
                       approximates GMA
                    CIA: allows (UEP – DAC) to be used only if it's a reasonable approximation to the explicit
                       valuation approach
                    DAC deferral:
                     IFRS 17: entity may choose deferral or direct expense for short-term contracts
                     CIA: no deferral in explicit valuation, but deferral if (UEP – DAC) is held
                    DAC amount:
                     IFRS 17: allows deferral of DAC that is directly attributable to the portfolio of insurance
                       contracts
                     CIA: allowable deferral is different
                    Discounting of LRC:
                     IFRS 17: entity may choose not to discount (if discounting is not significant)
                     CIA: requires discounting
                    Discounting of LRC:
                     IFRS 17: ignore discounting and financial risk for LIC if:
                         - PAA is used for LRC
                         - LIC cash flows are received ≤ 1 year within incurred date of claims
                     CIA: requires discounting

Answer: 5
Points: 1.50 points

Source: Land.Cases

(0.75 points) a. likely outcome: - insurer must provide coverage
                    precedent: - Amos v ICBC
                    explanation: PURPOSE TEST: was the car being used in a normal way? **Yes.**
                                      CAUSALITY TEST: was there a link between the use of the car
                                          and the shooting? **Yes.**
                                      - Supreme Court agreed that purpose test and causality test had
                                        been satisfied
                                      (Note that this may not be applicable in Ontario where the policy term
                                      "arising from" is replaced by "caused by".)

(0.75 points) b. likely outcome: - city must pay 6 million in damages
                    precedent: - Belangar v Sudbury
                    explanation: - the city claimed they followed established procedures
                                      - appeals court upheld award stating that "standard of care" had
                                        been breached
                                      - city should ADAPT to conditions, not just blindly follow procedures

Answer: 6
Points: 2.50   points

Source: Dav.NonPec

(0.5 points)   a.   The Supreme Court of Canada established a $100,000 cap on non-pecuniary damages.
                    (later given an inflation-adjustment, and subject to certain exceptions)

(0.5 points)   b.   <u>Any 2</u>:
                      - limitless claims by the severely injured lead to extravagant awards
                      - extravagant awards lead to social burdens that impact availability & affordability
                      - plaintiff would already be fully compensated for loss of income & future care
                      - ensures predictability of awards *(creates a good environment for insurers)*

(1 point)   c.   exceptions: - sexual abuse (S.Y. v F.G.C.)
                                         - defamation (Hill v Church of Scientology, Young v Bella)
                                         - negligence causing financial loss

                    reason: - no evidence that cost of insurance or social burden would be increased

(0.5 points)   d.   - minor injuries may be <u>over</u>-compensated
                    - major injuries may be <u>under</u>-compensated *(because past a certain point, there is no
                      longer a distinction based on severity)*

Source: Chev.Agric

(0.75 points)   a.   agricultural insurance: - protects against production loss
                        agricultural stability: - protects against margin decline
                        agricultural recovery: - protects against disaster

(0.5 points)   b.   A = Area   PG = Production Guarantee
                        P = Probable Yield   AP = Actual Production
                        C = Coverage Level

                        PG   Indemnity
                         = A x P x C   = max(0, PG - AP) x (insured price)
                         = 35 x 15,000 x 80%   = max(0, 420000 - 330000) x 0.26
                         = 420,000   = 23,400

(0.5 points)   c.   i   to reflect current production capability
                        ii   *Any 1 of:*
                                 - change in farming or management practices
                                 - change in insurance programme design
                                 - change in data source or data collection technique
                                 - maturity of perennials (yield would vary of their life cycle)
                                 - quality variation of crop from year-to-year (possibly due to insured perils)

(0.75 points)   d.   i   a load in rates to recover deficits and maintain surplus
                        ii   FOR ALL base & adverse scenarios with:
                                 initial deficit = 6th yr, 95th percentile
                                MUST RECOVER DEFICIT:
                                 - in 15 years on average
                                 - in 25 years with 80% probability

Answer: 8
Points: 3.50   points

Source: FA.Dutil

(1.25 points)   a.   - PPA only
                     - insured can't be eligible for FARM
                     - policy must satisfy statutory minimum coverage requirements
                     - insurer must follow proper classification and rating, and provide documentation
                     - insurer must use approved rates

(0.25 points)   b.   insurer has incentive to:
                      - use effective U/W
                      - maintain adequate pricing
                      - manage claims properly

(1 point)   c.   admission:
                      FARM: - only if agent/broker cannot place business with a voluntary company
                      RSPs: - use U/W rules of ceding company

                     participation ratio:
                      FARM: - established separately by jurisdiction, class, AY
                      RSPs: - established in proportion to direct earned exposures for:
                                  Total, Voluntary, PPA, Non-Fleet, 3rd Party Liability

(1 point)   d.   First calculate the participation ratio PR:
                      = (company ceded exposures) / (province ceded exposures)
                      = 2,000 / 25,000
                      = 8%

                     Now, the company's share of the losses is
                      = (province ceded losses) x PR
                      = 1.200,000 x 8%
                      = 96,000

                     And the company's share of the premium is
                      = (province ceded premiums) x PR + (company ceded premium) x PEA
                      = 750,000 x 8% + 40,000 x 27%
                      = 70,800

                     Putting it all together, the loss ratio is
                      = (company's share of losses) / (company's share of premium)
                      = 96,000 / 70,800
                      = **135.6%**   **<== final answer to part (d)**

Source: IIC.Terrorism

(0.5 points)   a.   *Any 2 of:*
                      organized attacks → lone actors
                      bombings → armed attacks
                      state targets → civilian targets

(0.75 points)   b.   Hint: **RIP**
                      Terrorism is defined as an act committed for any of these purposes:
                        Religious
                        Ideological
                        Political

(0.5 points)   c.   *Any 2 of:*
                      - attractiveness of location as a terror target *(# of employees, profile of business)*
                      - accessibility of location *(security, # of entry points)*
                      - financial impact *(risk to assets, business interruption)*
                      - crisis management framework

(0.25 points)   d.   - a percentage of property premium

Source: ICBC.Affordable

(1 point)   a.   *Any 4 of:*
              Fair, **A**ffordable, **S**ustainable, **E**fficient, **S**imple

Answer: 11
Points: 2.75 points

Source: IBC.Flood

(0.5 points)   a.   *Any 2 of* : [Hint: **adverse-under-maps**]
          adverse: - adverse selection (if offered, only people who definitely need it would
                      buy it, and it would be too expensive)
          under: - government under-investment in risk planning and mitigation
          maps: - lack of effective flood hazard maps

(0.75 points)   b.   *Any 3 of* : [Hint: **BAIL** me out!]
        Building codes that are obsolete
        Asset management that is poor
        Infrastructure is lacking *(levies, sewers,...)*
        Land use planning is inadequate

(0.5 points)   c.   *Any 2 of:*
        - private insurance may have <u>coverage limits</u> that are exceeded in a major disaster
         (so government pays the excess)
        - government may subsidize otherwise <u>uninsurable risks</u> through taxation
        - provide accurate flood <u>maps</u>
        - provide good <u>infrastructure</u> *(levies, sewers)*
        - <u>educate</u> public on ways to mitigate and financially plan for flood losses
        - provide incentives for public to mitigate risks by <u>limiting</u> government compensation

(1 point)   d.   *Any 4 of:*   *(regarding the U.K. flood insurance program)*
        model: *- private*
        purchase: *- voluntary*
        package: *- bundled with homeowner's insurance*
        pricing: *- risk-based*
        subsidies: *- cross-subsidized among policyholders*
        government: *- acts as an enabler through risk: mitigation, flood mapping, zoning*

Answer: 12

Points: 4.00 points

Source: BCAR.Cdn2018

(3 points) a. **step 1:** calculate AC starting with Reported Capital (surplus) and making the indicated adjustments

add: equity adjustments

subtract: intangibles & goodwill

then | AC | = | 2,660 | + | -76 | - | 133 |

= 2,451

step 2: calculate NRC for each VaR level using the covariance adjustment formula

NRC

= (B7) + SQRT [(B1)^2 + (B2)^2 + (B3)^2 + (0.5x(B4))^2 + (0.5x(B4) + (B5))^2 + (B6)^2 + (B8)^2]

		VaR 95	VaR 99	VaR 99.5	VaR 99.6
NRC	=	1,082	1,575	1,774	1,839

step 3: calculate BCAR corresponding to each VaR level using the standard formula

BCAR   =   (AC - NRC) / AC x 100

		VaR 95	VaR 99	VaR 99.5	VaR 99.6
BCAR	=	55.8	35.8	27.6	25.0

step 4: use the BCAR results at the different VaR levels to determine the A.M. Best financial strength rating

| rating | = | very strong |

<== final answer

(1 point) b. Hint: **Q²-SALAMI** *(Cured Salami - put meat on the bones of the basic BCAR numbers)*

<u>Any 4</u>

Q²: Quality of capital, **Q**uality of reinsurance

Stress testing *(how well does the company perform under stress)*

Adequacy of reserves

Liquidity of Capital

Actions of affiliates *(affiliates could drag you down or pull you up)*

Matching of assets & liabilities *(this is desirable for paying your bills on time)*

Internal capital models *(is there a good procedure for assessing capital needs)*

TIP: *Make sure you also look at the practice template for the calculation of B5. This is in BattleQuiz #4 of the BCAR.Cdn2018 wiki article.*

Source: OSFI.MCT

(2 points)   a.   capital available gross of deductions: 69,500 *(sum entries in first table)*
deduction for unregistered reinsurance: 0 *(see full solution in external PDF)*
deduction for excess B & C capital: 1,625 *(see full solution in external PDF)*
MCT net capital available   **67,875**

(4.5 points)   b.   capital required for <u>insurance</u> risk: 35,584 *(sum the components)*
  component: unpaid claims   14,070 *(see full solution in external PDF)*
  component: premium liabilities   14,514 *(see full solution in external PDF)*
  component: unregistered reinsurance   2,000 *(given)*
  component: catastrophes   5,000 *(given)*

capital required for <u>market</u> risk: 9,000 *(sum the components)* [Hint: **Mr. IFER**]
  component: interest rate risk   3,000 *(given)*
  component: foreign exchange   1,000 *(given)*
  component: equity   4,500 *(given)*
  component: real estate   500 *(given)*

capital required for <u>credit</u> risk: 4,550 *(given)*

capital required for <u>operational</u> risk: 10,597 *(see full solution in external PDF)*

MCT minimum capital required: **36,368**
  diversification credit: 5,180

(0.5 points)   c.   MCT ratio: = CapAvail / minCapReq
= 67,875 / 36,368
= 187%

This is ABOVE the supervisery target of 150%. (*They would NOT be under increased scrutiny by OSFI.)*

Source: CCIR.ARinstr

(1.25 points) a. investment income = (yield rate) x (money lying around)

= 7% x 19,100

= 1,337.0 <== final answer to part (a)

money lying around = + items - - items

= 19,100

+ items	average		- items		average
UCAE	12,250		DPAE		0
UPR	5,500		receivables: installment premiums		0
PDR	500		receivables: PH + agents & brokers		200
UEcomm	1,050				
total	19,300		total		200

The UCAE average of 12,250 is calculated as the average of (CY 2015) & (CY 2014) as follows:

CY 2014: SUM(APV at Dec14) over all accident years

= 3,000 + 4,000 + 4,500

= 11,500

CY 2015: SUM(APV at Dec15) over all accident years

= 2,000 + 3,000 + 3,500 + 4,500

= 13,000

UCAE average = average(11,500 , 13,000)

= 12,250

(0.75 points) b.   We must apply the following formula for each AY for CY 15 and then SUM

excess amount = [U(beg) - U(end) - Pd(All) + ii]

Let's first reorganize the given information into triangles to make it (hopefully) easier to understand.

paid loss during CY

AY / CY	CY 12	CY 13	CY 14	CY 15
AY 12	0	0	0	800
AY 13		0	0	900
AY 14			0	1,000
AY 15				4,000

discounted UCAE (including PfAD) at END of CY

AY / CY	CY 12	CY 13	CY 14	CY 15
AY 12	0	0	3,000	2,000
AY 13		0	4,000	3,000
AY 14			4,500	3,500
AY 15				4,500

Let's calculate (excess amount)$_{AY12}$ in detail, then the other AYs are similar:

(excess amount)$_{AY12}$	=	3,000	-	2,000	-	800	+	ii	
	=	3,000	-	2,000	-	800	+	175.0	
	=	375.0							

where ii = investment income

ii$_{CY12}$	=	7%	x	average(	3,000	,	2,000	)
	=	175.0						

	=	4,000	-	3,000	-	900	+	245	=	345.0
	=	4,500	-	3,500	-	1,000	+	280	=	280.0
	=	cannot be calculated for the most current AY / CY combination: set = 0 by defn								0

final answer to part (b) ==> total AY12, AY13, AY14, AY15 = 1,000.0

Source: MSA Ratios

(0.75 points) a.

InvYld	=	2	x	NII	/	(	InvAss0	+	InvAss1	-	NII	)
	=	2	x	7,500	/	(	96,600	+	90,200	-	7,500	)

InvYld = 8.37%   <== final answer to (i) - use judgment to assess financial health *(Looks pretty good!)*

NII	=	InvInc	+	Realized Gains/Losses		-	InvExps
NII	=	10,000	+	-1,700		-	800
	=	7,500					

InvAss	=	cash	+	bonds & debentures	+	commons shares	+	real estate	
InvAss0	=	5,800	+	63,500	+	3,400	+	23,900	= 96,600
InvAss1	=	7,800	+	58,300	+	4,500	+	19,600	= 90,200

(0.75 points)

ROE	=	(	NI.preTax	-	Tot. Tax	)	/	equity
	=	(	6,200	-	4,000	)	/	50,300

ROE = 4.37%   <== final answer to (ii) - compare to acceptable minimum of 5.4%   BAD

NI.pretax	=	NEP	-	net.CAE	-	TotAcq	-	GenExps	+	NII
	=	70,800	-	60,400	-	7,200	-	4,500	+	7,500
	=	6,200								

NEP	=	NWP	-	change(UEP)				
	=	NWP	-	[	current(UEP)	-	prior(UEP)	]
	=	69,000	-	[	-1,800	]		
	=	70,800						

(0.75 points)

ROA	=	(	NI.preTax	-	Tot. Tax	)	/	(2-yr average of assets)		
	=	(	6,200	-	4,000	)	/	average (	181,100	, 163,100

= 1.28%   <== final answer to (iii) - compare to acceptable minimum of 2.6%   BAD

(0.5 points)

Net U/W Leverage Ratio	=	NWP	/	equity
	=	69,000	/	50,300

= 137%   <== final answer to (iv) - compare to acceptable MAXIMUM of 300%

GOOD

(1 point)   **Calculation of UCAE:**   *We're given the value for Net Leverage Ratio, so let's write down the formula and see where it leads…*

Net Leverage Ratio	=	(	NWP	+	Net.Liabs	)	/	equity
220%	=	(	69,000	+	Net.Liabs	)	/	50,300
==> Net.Labs	=	41,660	<== Net.Liabs was the only unknown so I decided to solve for it

Ok, but where do we go from here? You need to relate the unknown, UCAE recoverable, to quantities we have. To do this, it helps to recall that "Net" means "Net of reinsurance". Then we can relate "Net" and "Total" liabilities with this formula…

Net.Liabs	=	Tot.Liabs	-	UCAE recoverable	-	UEP recoverable
41,660	=	130,800	-	UCAE recoverable	-	17,100
UCAE recoverable	=	72,040	<== final answer to UCAE recoverable			

The term "Tot.Liabs" used in the above calculation was calculated as follows:

Tot.Liabs	=	Tot.Assets	-	equity	=	181,100	-	50,300	=	**130,800**

Source: CCIR.ARinstr

(2.25 points)   a.   The key is knowing the layout of the exhibit and the formulas to complete the columns. It is
exactly like 2016.Spring #18. I found the answer in the <u>examiner's report very confusing</u>.
It's much easier if you put everything into a table like in **Exhibit 80.10**. You can see the layout
of this **net commissions exhibit** in the sample quarterly statement.

There is a <u>summary box</u> to this exhibit that isn't given in the statement of the problem. You
have to memorize this. The only number you don't have is the ***commission expense.***

summary of commissions		
gross		
commission expense	1,550	**= (02) + (04) + (05) - (08)** [use totals row]
contingent commission	800	*<-- given*
other non-deferrable commission	400	*<-- given*
total gross	2,750	*= sum of gross commissions*
ceded		
commission income	1,400	*<-- given*
contingent commission	200	*<-- given*
other non-deferrable commission	75	*<-- given*
total ceded	1,675	*= sum of ceded commissions*
TOTAL NET COMMISSIONS	**1,075**	*= (total gross) - (total ceded)*

final answer ----> (points to TOTAL NET COMMISSIONS row)

So, we have to get the total for column (05). We need the corresponding value for LOB 2.
This is easy. We just use the standard formula:

Direct + Assumed - Ceded = Net

Rearrange this as follows:

Assumed = Net - Direct + Ceded
                     = 1,000 - 1,200 + 300
                     = 100

Substitute this into the table below and calculate the sum of column (05). ***C'est très facile!***

	(02)	(03)	(04)	(05)	(06)	(07)	(08)	(09)	(10)
	DFcomm	UEcomm	**commissions in respect of WP**				DFcomm	UEcomm	Net
LOB	@ start	@ start	Direct	Assm'd	Ceded	Net	@ end	@ start	Comm
1	1,200		1,100	150	500		2,200		
2	1,700		1,200	100	300	1,000	1,700		
Tot	2,900		2,300	250	800		3,900		

Now we calculate the commission expense using the green highlighted values:

          commission expense   = (02) + (04) + (05) - (08)
                                  = 2.900 + 2,300 + 250 - 3,900
                                  = 1,550

Source: OSFI.Eqk

(1 point)   a.   ERX_1 (Earthquake Risk Exposure) *without phase-in*

= ((East Canada PML500)^1.5 + (West Canada PML500)^1.5) ^ (1/1.5)

= (60,000^1.5 + 240,000^1.5) ^ 1/1.5

= 259,605

ERX_2 (Earthquake Risk Exposure) *with phase-in*

= ERX1 **x (year - 2014)/8** + max([East Can PML420], [West Can PML420]) **x (2022 - year)/8**

= 259,605 x (6/8) + 120,000 x (2/8)

= **224,704**

ERC (Earthquake Reserve Component)

= ERX_2 - (Financial Resources)

= **224,704** - 55,000

= 169,704

ER (Earthquake Reserve)

= (ERC + EPR) x 1.25

= (169,704 + 29,600) x 1.25

= **249,130**   **<== final answer**

(0.5 points)   b.   *Any 3 of:*

risk management

 - earthquake exposure risk management policies are subject to oversight by Board of
   Directors and implemented by Senior Management

data management

 - data required is MORE than for traditional ratemaking

 - must address data **I**ntegrity, **V**erification, **L**imitations (**IVL**)

models

 - understand (assumptions, methods, limitations) of earthquake models

PML *(Probable Maximum Loss)*

 - PML = Total Expected Ultimate Cost

 - includes considerations for data quality, non-modeled exposure, model uncertainty
   multi-region exposure

financial resources & contingency plan

  - Financial Resources: quantification of how financial resources cover PML

  - Contingency Plan: how to continue efficient business operations after disaster

(0.75 point)   c.   *Any 2 of:*   [Hint: **DAQKD-UP**]

Docs: - document use of model within risk management program

Alternative: - explain why a particular model is used versus alternatives

Qualified: - qualified staff needed to run in-house models regularly

Knowledge: - AML (require KNOWLEDGE of Assumptions, Methods, Limits of Model)

Data: - must show that GRANULARITY & QUALITY of data is appropriate

Uncertainty: - understand how uncertainty affects: (capital adequacy, reinsurance)

PML: - if PML_1 <> PML_2: explain (differences, subsequent model adjustments)

Source: Reinsurance

(0.75 points)   a.   transfer of risk: - yes
                     type of method: - qualitative
                     method: - apply the 'substantially all' rule
                                            - the insurer <u>can</u> suffer a loss, but it isn't large enough to pass the
                                              ERD test *(see below)*
                                            - but since the quota-share percentage is 90%, we can apply the
                                              'substantially all' rule to conclude there <u>is</u> risk transfer
                                            - this may be a situation where the risk manager wants to withdraw
                                              immediately from the market

this shows that the ERD test fails ==> - ERD *(Expected Reinsurer Deficit)*
(but it doesn't matter in this case)   - frequency of loss = 10%
                                               - severity of loss as a % of premium = 15,000/1,500,000 = 1%
                                               - ERD = frequency x severity = 10% x 1% = 0.1% < 1%
                                            - this test requires ERD > 1% for transfer of risk
                                            - by the ERD test there would be NO transfer of risk

(0.75 points)   b.   transfer of risk: - no
                     type of method: - quantitative
                     method: - ERD *(Expected Reinsurer Deficit)*
                                            - frequency of loss = 6%
                                            - severity of loss as a % of premium = 150/1000 = 15%
                                            - ERD = frequency x severity = 6% x 15% = 0.9% < 1%
                                            - this test requires ERD > 1% for transfer of risk
                                            - therefore there is NO transfer of risk

Source: CIA.DCAT

(1 point) a. Requirements for good financial condition:
 [1] MCT ratio > 150% (*for base scenario, for all years*)
 [2] Capital > 0 (*for base and all adverse scenarios for all years*)

Company A: good financial condition
 - condition [1] is satisfied
 - condition [2] is satisfied because capital > 0 for base & adverse scenario for all years

Company B: cannot conclude good financial condition
 - condition [1] is <u>not</u> satisfied because MCT < 150% for 3rd year of base scenario
 - condition [2] is satisfied because capital > 0 for base & adverse scenario for all years

(1 point) b. **plausible adverse scenario:**
 - (set of assumptions) for an (undesirable but reasonably possible event) relating to
   (insurer's financial condition)
 - statistically, the scenario should lie between the 95th and 99th percentile on the loss
   distribution *(the CAS seems to require this as part of the definition)*
 reverse stress testing:
 - HOW FAR must risk factors change TO DRIVE the insurer's surplus negative during forecast
   period THEN determine whether such change is plausible

(1 point) c. There are lots of valid answers. Here are the ones I chose:
 ripple effects:
 - significant reduction in cash flow
 - forced sale or liquidation *(to pay policyholder claims)*
 management actions:
 - sell assets to raise cash
 - change investment strategy *(rebalance portfolio from stocks to bonds to reduce risk)*

Exam: BattleActs 6C Practice Exam 2 (2019.Fall) - **[ANSWER SHEET]**   page 51
Answer: 20
Points: 1.25   points

Source: CIA.PrLiabs

(0.5 points)   a.   *This is the easy version of the DPAE problem. You should also practice the harder version where you are __not__ given **APV** but have to calculate it. There is a practice template for both versions in the BattleQuizzes for CIA.PrLiabs.*

DPAE	=	UPR	-	PolLiabs(UPR)	+	UEComm
	=	72,890	-	68,486	+	1,130
	=	5,534		<== *final answer to part (a)*		

PolLiabs(UPR)						
	=	APV	+	FutRe	+	maintenance
	=	58,846	+	5,960	+	3,680
	=	68,486				

(0.5 points)   b.   DPAE is an <u>asset</u>. Its **purpose** is to recognize prepaid policy expenses over the policy term provided such costs are recoverable from equity in the UPR. *(This has the advantage of matching of revenue and expenses.)*

             Not part of the question: *Only 1 of DPAE and PDR can be non-zero. Also, PDR is a* <u>*liability*</u> *.*

(0.25 points)   c.   *Any 1 of:*   *(there are probably other examples also)*
             - commissions
             - TLF (Taxes, Licenses, Fees)
             - advertising

Source: BCAR.Cat

(1 point) a. **surplus**: - reduce reported surplus by PML (net post-tax 1-in-100 year event)

reinsurance: - increase reinsurance recoverables by at least 40% of ceded PML

reserves: - increase reserves by 40% of net PML

optional: - adjust PMLs used in cat risk portion of standard BCAR score due to changes in reinsurance structure after 1st cat event

After completing these 4 steps, recalculate the BCAR score according to the standard methodology.

This is <u>different</u> from the answer given in examiner's reports for <u>2018.Spring and prior</u> .
(The syllabus changed for 2018.Fall)

(1 point) b. **catastrophe modeling:**
- parameter selection is critical & use more than 1 model
data quality:
- accurate property location & coding (type of building)
- accurate property value & insurance-to-value
- conduct site reviews (so that information is up-to-date)
- safeguards to prevent manipulation by insured
aggregate loss exposure:
- use aggregate losses as a secondary test of model
monitoring (MML):
- Measure, Monitor, Limit exposure on a continuous basis

(0.5 points) c. BCAR: - capital must support <u>current & future</u> premium risk

MCT: - focuses more on <u>current year's</u> risk

Note: DCAT usually projects for 3 years, so if you combine MCT with DCAT, you get a longer time horizon *(not part of answer, just a side note.)*

Exam: BattleActs 6C Practice Exam 2 (2019.Fall) - **[ANSWER SHEET]**

Answer: 22

Points: 2.00 points

Source: CIA.Disclosure, CIA.Runoff, CIA.Discnt

(0.5 points)   a.   *Any 2 of:*

diversification:	- by line of business *(more lines is better)*
diversification:	- geographically *(greater diversification is better)*
U/W limit:	- lower is better
reinsurance:	- more sources of reinsurance is better

(0.5 points)   b.   - discount the paid & unpaid amounts at time *t* back to time *t - 1*

    - subtract investment income earned during calendar year *t* on supporting assets and liabilities

(1 point)   c.   *Any 4 of:* [Hint: **MARY-(IE)-CapG**]

    Methods for asset valuation and reporting investment income

    Allocation of assets and investment income by LOB

    Return on assets <u>at</u> balance sheet date

    Yield on assets acquired <u>after</u> balance sheet date

    Investment **E**xpenses and losses from default

    CapG: capital gains/losses on assets sold <u>after</u> balance sheet date

Notes: a.   *from wiki article CIA.Disclosure*

    b.   *from wiki article CIA.Runoff and 2016.Fall #26d*

    c.   *from wiki article CIA.Discnt and **BattleHack #1: Top Questions***

Source: Odo.FinReg, IFA.Solvency2

(1.5 points)   a.   **3 pillars:**   [Hint: **QGT**]

Quantitative Pillar:
  - sets SCR & MCR *(Solvency Capital Requirement & Minimum Capital Requirement)*
  - SCR corresponds to 99.5% VaR *(Value at Risk)*

Governance Pillar:
  - requires adequate governance for:
        - internal audit
        - actuarial
        - risk management
        - compliance

Transparency
  - supervisory reporting & public disclosure
    (increases market discipline because companies know their decisions are public)

(0.5 points)   b.   - the <u>balancing amount</u> required to bring the best estimate of loss reserves before ENID
    up to an amount allowing for all possible future outcomes

(0.75 points)   c.   *Any 3 of:*   consider...
      - future settlements of past events
      - potential future claims related to current exposures
      - catastrophes
      - court awards
      - legislative changes

Exam: BattleActs 6C Practice Exam 2 (2019.Fall) - **[ANSWER SHEET]**   page 55
Answer: 24
Points: 2.00 points

Source: OSFI.ORSA

(1.5 points)   a.   *Any 3 of:*

     risk identification and assessment:
      - identify & assess the materiality of foreseeable & emerging risks
     relate risk to capital:
      - set internal capital using stress-testing techniques
      - must withstand a specified loss without falling below supervisory capital requirements
     responsibilities of Board of Directors:
      - review reasonableness & appropriateness of risk profile & capital requirements in the
       context of board approved risk appetite & risk tolerance
     monitoring & reporting of risks:
      - annual reports to Board of Directors & Senior Management on risk profile & capital
       assessment
     internal controls & objective review
      - review for accuracy, integrity, reasonableness
      - objective reviewer: internal or external auditor OR skilled professional not involved in
       the ORSA process

     NOTE: *The answers given in the examiner's report for 2015.Fall #23 are very long. I think shorter answers could still receive full credit because each element is only worth 0.5 points.*

(0.5 points)   b.   *Any 1 of:*

     - ORSA considers **more risks** than MCT and includes all material risks
     - ORSA considers **dependencies** and correlations between risks whereas MCT uses a
      simplified approach that only considers correlation between insurance and asset risk
     - ORSA includes assessment of **internal controls** to allow for better management
     - ORSA allows for the setting of an **internal target** to reflect an insurer's risk appetite
     - ORSA allows for a better **qualitative** assessment of risk *(MCT is only quantitative)*
     - ORSA is **tailored** to a company's own risk profile, whereas MCT is a
      formula-based approach that is not specific to the company
     - ORSA is more of a **forward-looking** measure
     - ORSA is used for **mitigation** *(or prevention)* of future problems

     Note:
     - several of these also apply to BCAR versus MCT

Source: CIA.Models

(1.5 points)   a.   **model elements:**
- all models require 3 elements: [Hint: **SIR**]
model **S**pecification
==> a description of the <u>parts</u> of a model and their <u>interactions</u> *(includes data,*
assumptions, methods, entities, events)
model **I**mplementation
==> the <u>systems</u> that perform the calculations *(computer programs, spreadsheets,...)*
model **R**un
==> the <u>inputs/outputs</u> of the implementation

(2 points)   b.   **validating a new model:**   *(see BattleCard answers for more details if desired)*
review specification:
==> verify that DAMs are appropriate *(**D** ata, **M** ethods, **A** ssumptions)*
validate implementation:
==> do backtesting with historical data
deal with limitations:
==> understand the range of uses for which the model was designed & tested
keep documentation:
==> how the model was chosen & tested *(should also note limitations of model)*

(2 points)   c.   For severity of failure, consider: [Hint: **FIF**]
Financial significance: high *(so risk is high)*
Importance of Model: no info provided
Frequency of use: high *(so risk is high)*
Conclusion: severity risk is HIGH

For likelihood of failure, consider
complexity: - high *(so risk is high)*
expertise of user: - low *(so risk is high)*
docs: - none *(so risk is high)*
testing: - none *(so risk is high)*
Conclusion: likelihood of failure is HIGH

Overall conclusion: risk of model failure is HIGH

Source: OSFI.CorpGov

(1.5 points) a. *Any 2 with 2 sub-points:* *(See 2015.Spring #4 for other answers)*
Risk Appetite Statement
 - reflects aggregate <u>level</u> of risk
 - reflects <u>type</u> of risk
Risk limit/Risk tolerance is the allocation of the FRFI's risk appetite statement to
 - specific risk categories *(IMCO: insurance, market, credit, operational)*
 - line of business
Roles/Responsibilities of those implementing Risk Appetite Framework
 - Board of Directors
 - Senior Management

(0.5 points) b. *elements of good corporate governance:*
 - **incentivize** good corporate behaviour
 - **enable monitoring** of operations & performance

Source: CIA.Subseq

(0.25 points) a. **subsequent event:**
      - an event the AA becomes <u>aware of</u> after the calculation date but before the report date

(1.5 points) b.   i   - actuary became aware after the CalcDt but before the RptDt, therefore this
         is a subsequent event and we're on the middle branch
       - **E**rror: <u>no</u>
       - **W**hen did event occur: <u>after CalcDt</u>
       - **D**ifferent *(did the event make the entity different?)* : <u>yes, before CalcDt</u>
        (failure provided further evidence of deteriorating conditions with reinsurer)
       --> **reflect** *(assuming the event is material)*

    ii   - actuary became aware after the CalcDt but before the RptDt, therefore this
         is a subsequent event and we're on the middle branch
       - **E**rror: <u>no</u>
       - **W**hen did event occur: <u>after CalcDt</u>
       - **D**ifferent *(did the event make the entity different?)* : <u>yes, after CalcDt</u>
       - **P**urpose: report on entity as it <u>was</u>
       --> **inform only** *(assuming the event is material)*

    iii   - actuary became aware after the CalcDt but before the RptDt, therefore this
         is a subsequent event and we're on the middle branch
       - **E**rror: <u>no</u>
       - **W**hen did event occur: <u>after CalcDt</u>
       - **D**ifferent *(did the event make the entity different?)* : <u>yes, after CalcDt</u>
       - **P**urpose: report on entity as it <u>was</u>
       --> **inform only** *(assuming the event is material)*

Answer: 28
Points: 2.75 points

Source: OSFI.AA

(1 point) a. **legal requirements:** Any 4 of…
  - insurer must appoint an AA
  - insurer must notify OSFI of the appointment
  - AA must be a FCIA
  - AA cannot be CEO/COO or anything similar without authorization from OSFI
  - AA cannot be CFO without audit committee permission
  - insurer must notify OSFI if the Board of Directors revokes AA's appointment
  - outgoing AA must submit report to Board of Directors & OSFI on reasons for leaving
  - incoming must review outgoing AA's report within 15 days *(if report is available)*

(1 point) b. **roles & duties:** *Any 4:*   See 2016.Fall #34c
  - perform valuation of policy liabilities at year-end using accepted actuarial practice
  - produce <u>AA</u> report
  - produce annual <u>financial position</u> report to Board of Directors
  - produce <u>financial condition</u> report when directed by OSFI, possibly using DCAT
  - produce <u>MAE report</u> (Material Adverse Event) for items requiring rectification
  - produce <u>policyholder report</u> on whether policyholders are treated fairly regarding
    dividends, bonuses, other benefits
  - final opinion/memo on financial statement items requiring significant calcs or judgment

(0.75 point)   Hint: **AAC**   See 2016.Fall #27f
  Assist OSFI in assessing insurer safety & soundness
  Assist AA by providing independent advice and a source for professional development
  Confidence: increase confidence in the AA with management, public, regulators