

ILA 201-I Model Solutions

March 2026

1. Learning Objectives:

3. Analyze the impact of risk diversification, including considerations for modeling and offsets between mortality and longevity risk.
4. The candidate will understand value creation and inforce management techniques for life and annuity products.

Learning Outcomes:

- (3b) Understand the role and framework used by regulators and credit rating agencies for evaluating life insurance companies.
- (3c) Explain and understand the use and application of the Own Risk Solvency Assessment (ORSA) report.
- (4b) Describe, evaluate, and apply the economic value creation framework.

Sources:

Economics of Insurance: How Insurers Create Value for Shareholders, Swiss Re, 2001, pp. 4-31

Financial Condition Testing (FCT) Jan 2023 including Appendix A only
OSFI: Own Risk and Solvency Assessment (E-19), December 2017

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Critique the following statements:

- (i) *The S&P 500 Index can be used as a benchmark to determine the base cost of capital. Most candidates did not define the base cost of capital correctly, consequently stating the S&P500 was not a good benchmark. This question was generally poorly answered.*

This statement is true. The return of the S&P 500 Index minus the replicating portfolio return can be used to determine the base cost of capital, as it refers to the opportunity cost of the shareholder for investing in the insurance company, instead of investing in a financial market.

1. Continued

The cost of capital for an insurance company tends to be higher to further compensate the shareholder for frictional costs such as agency cost, cost of potential financial distress, and regulatory restriction costs that are specific to an insurance company.

- (ii) *A replicating portfolio with fixed income can be used to hedge risks in variable annuities with a rider which guarantees minimum lifetime payments to the annuitant.*

Most candidates did not mention the put option within the variable annuities product; therefore, did not recognize that the fixed income return would not hedge the upside of the VA product. This question was generally poorly answered.

This statement is false. Variable annuities (VA) are usually linked with returns on equities. The VA behaves differently than fixed income securities such as bonds. Guaranteed minimum lifetime payments resemble a put option when the VA is in the money. So, a put option is needed as part of the replicating portfolio for a VA with a guaranteed minimum lifetime payment.

- (iii) *A regulator raises capital charges on risky assets that are used to support a life insurance company's liabilities. This does not affect the economic value of the company.*

This question was generally well answered, with most candidates recognizing increased capital charges would lead to higher frictional costs, which in turn would affect the company's economic value.

This statement is false. Raising capital charges on risky assets will increase the regulatory required capital. This will impact the frictional costs and lead to a reduction in the economic value of the company.

- (iv) *A Canadian life insurance company's Internal Capital Targets may be determined by adding a 5% margin to the Life Insurance Capital Adequacy Test (LICAT) Supervisory Targets.*

Most candidates recognized adding 5% is not appropriate, but not all were able to recommend how the internal capital targets should be determined.

1. Continued

This statement is false. Internal Capital Targets are supposed to be determined from an insurer's ORSA. Sensitivity testing as well as more sophisticated methods especially for more material risks (e.g. stochastic models for interest rate risk) are used to help determine the insurer's expected capital needs. Adding a 5% margin to the supervisory targets would not be sufficient in either case for these conditions.

Commentary on Question:

Overall part (a) was generally poorly answered by the candidates. Please see the comments in red above for each specific section.

(b) You are given:

- Cost of risk capital: 6%
- Default spread: 1%
- Interest rate: 5%

Time (Years)	0	1	2
Premium	100	80	0
Claims	0	-70	-30
Expense	-20	-15	-10
Risk Capital	-15	-50	-7

(i) Calculate economic value.

	0	1	2
Premium	100.00	80.00	0.00
Claims	0.00	-70.00	-30.00
Expense	-20.00	-15.00	-10.00
Cost of risk capital		-0.90	-3.00
Net cashflow	80.00	-5.90	-43.00
Discount factor		0.94	0.89
Economic liability	43.84	40.57	0.00
Economic Value	36.16		

Note: To reflect the cost of default, add 1% default spread to the 5% risk free rate.

This part of the question was generally well answered. Most candidates lost marks from using the incorrect discount rate, as they did not include the 1% default spread and only used the 5% interest rate.

1. Continued

- (ii) Calculate economic profits in years 1 and 2.

	0	1	2
Premium	100.00	80.00	0.00
Investment return		2.63	2.43
Claims	0.00	-70.00	-30.00
Expense	-20.00	-15.00	-10.00
Cost of risk capital		-0.90	-3.00
Change in Economic Liability	-43.84	3.27	40.57
Economic profit	36.16	0.00	0.00

This part of the question was generally well answered. Some candidates couldn't show it mathematically, but they knew that year 1 and 2 should have economic profits of 0.

Commentary on Question:

Most candidates scored higher on part (b) (calculations) than other parts.

See purple section above for answers to specific parts.

- (c) You are given the following Financial Condition Testing (FCT) results before management actions:

Year	Base Scenario		Going Concern Scenario		Solvency Scenario	
	LICAT Total Ratio (%)	LICAT Core Ratio (%)	LICAT Total Ratio (%)	LICAT Core Ratio (%)	LICAT Total Ratio (%)	LICAT Core Ratio (%)
Current	150	74	150	74	150	74
Year 1	152	74	125	60	92	49
Year 2	153	73	89	52	75	40
Year 3	155	72	86	48	55	32
Year 4	154	71	88	50	48	29
Year 5	155	73	84	53	40	26

Describe the additional information required to issue a satisfactory FCT opinion.

Commentary on Question:

It was determined that Question 1(c) pertained to material that was not on the published syllabus. As a result, adjustments were made to the pass mark for this sitting. The base FCT paper was intended to be on the syllabus (along with Appendix A) and this will be clarified for the July 2026 through July 2027 sittings.

1. Continued

Candidates were able to name the observable items from the table produced, including ratios under the supervisory minimum under what year and what scenario, but using the material on the base FCT paper would have allowed candidates to state what is needed to provide a satisfactory opinion.

A good number mentioned the need to know the internal target ratios, and the management actions. Very few mentioned how the company would ensure the management action could be implemented and their impact on the ratios, and the fact that assets must be greater than liabilities to pass the solvency scenario.

It is noted that the company is marginally above the regulatory targets for the Core Ratio under the Base Scenario. Also, the going concern scenario and solvency scenario falls below the regulatory minimum for both the Core Ratio and Total ratio.

- *The results will also have to be compared against the company's own internal target ratios based on the company's board approved ORSA.
 - *If the capital ratio(s) in the base scenario fall below the company's own internal target ratio(s), there must be a realistic plan to pass the base scenario, i.e. agreed to by Senior Management.**
- *Senior Management's/Board approved management actions for each scenario where the results fall below the threshold required to pass the scenario. Must also know the impact of the mitigating actions on:
 - *the ratios for the going concern scenario and*
 - *the assets and liabilities for the solvency scenario.**
- *Need to know what the assets and the liabilities are for each year in the solvency scenarios. For solvency scenarios, assets must be greater than the liabilities for all years to pass the scenario. This information cannot be determined solely by the LICAT ratios given.*
- *Senior Management's confirmation that they fully understand the various risks that the company is exposed to and the mitigating action plan for each adverse scenario tested. Ideally should know whether the management actions are corrective or routine and be comfortable that any corrective mitigating actions can be carried out.*
- *A minimum of 2 solvency scenarios and 1 going concern scenario should be run for the FCT. Results are only shown for one solvency scenario.*
- *The assumptions used in the projections provided will also be required and must be re-assessed for reasonableness to ensure the results provided are correct.*

2. Learning Objectives:

1. The candidate will understand and apply valuation principles to individual life insurance and annuity products issued by international life insurance companies.

Learning Outcomes:

- (1a) Describe the appropriate IFRS 17 accounting and valuation standards for life insurance and annuity products.
- (1b) Evaluate the appropriate IFRS 17 accounting and valuation standards for life insurance and annuity products.

Sources:

Educational Note: IFRS 17 Risk Adjustment for Non-Financial Risk for Life and Health Insurance Contracts

CIA Educational Note: Estimates of Future Cash Flows under IFRS 17

CIA Educational Note: Discount Rates for Life and Health Insurance Contracts

Commentary on Question:

This question is intended to test various IFRS 17 concepts (estimates of future cash flows, assumption setting, risk adjustment, discount rates).

Solution:

- (a) Critique the following statements. Justify your answer.
 - (i) *A pandemic-type scenario can have adverse impact on incidence and termination rates. For conservatism, a company should reflect the likelihood of this unfavorable extreme scenario when setting morbidity assumptions.*
 - (ii) *Mortality should be a blend of company and industry data, and higher weight should be given to the company's own experience.*

Commentary on Question:

Candidates struggled on part (i), with many candidates recommending excluding extreme scenarios due to their potential impact on pricing. Partial marks were awarded for recognizing that extreme scenarios would be reflected in the risk adjustment.

Candidates performed well on part (ii). A strong response explains that weight is directly dependent on credibility level of company data.

1. Continued

(i) This is true. Best estimate morbidity assumptions should reflect the expected value, or the probability-weighted mean, of the full range of outcomes. As such, actuaries should consider the likelihood of extreme scenarios such as a pandemic and their impact when setting morbidity assumptions.

(ii) This is false. Mortality generally is based on a blend of company and industry data, but the weight is dependent on the credibility level of the company data. A higher weight should only be given to the company's data if the company has sufficient historical experience that indicates a higher weight is appropriate. If there is low credibility, industry data should be given a higher weight.

- (b) Your company sells critical illness (CI) insurance that pays a one-time lump sum equal to the face amount if the insured is diagnosed with cancer or experiences a heart attack or stroke.

The following two changes to the product are being evaluated:

- Adding a return of premium on surrender
 - Adding a benefit that pays a one-time lump sum equal to 40% of the face amount if the insured experiences one of several mild illnesses
- a) Propose modifications to the IFRS 17 risk adjustment for each of the above product changes. Justify your answer.
- b) Propose modifications to the IFRS 17 discount rate for each of the above product changes. Justify your answer.

Commentary on Question:

Performance was mixed for this question.

For part (i), many candidates provided insufficient justification for their proposals, and some misinterpreted the question as requiring a specific adjustment to be proposed. Strong responses reference one of the characteristics of the risk adjustment noted in IFRS 17 guidelines.

Responses that differed from the solution below but provided sufficient justification would still receive full credit.

Part (ii) tested candidates' understanding of the liquidity characteristics of policy options and their impact on discount rates. Some candidates correctly identified impact on liquidity, but incorrectly applied this to the discount rate. A strong response clearly indicates the components of the discount rate, and the directional impact to liquidity and to discount rates.

1. Continued

(i) Adding a return of premium option increases the risk adjustment. This option increases the incentive to lapse, with anti-selective lapsation resulting in a higher risk pool of policyholders that retain their policies.

Adding a benefit option that includes milder illnesses would result in a higher risk adjustment. Including milder illnesses would widen the probability distribution under which a payment would be made which increases the risk adjustment.

(ii) In the bottom up approach, the discount rate is based on the risk free rate plus an illiquidity premium.

Adding a return of premium option on surrender would decrease the discount rate. A return of premium enhances the exit value for the policy holder which increases liquidity of the contract. Higher liquidity is associated with lower discount rates.

Adding a benefit option that includes milder illness would increase the discount rate. This feature encourages policyholders to hold onto their contract which builds the contract's inherent value. This results in lower liquidity higher discount rates.

3. Learning Objectives:

1. The candidate will understand and apply valuation principles to individual life insurance and annuity products issued by international life insurance companies.

Learning Outcomes:

- (1a) Describe the appropriate IFRS 17 accounting and valuation standards for life insurance and annuity products.
- (1b) Evaluate the appropriate IFRS 17 accounting and valuation standards for life insurance and annuity products.

Sources:

Educational Note: IFRS 17 Risk Adjustment for Non-Financial Risk for Life and Health Insurance Contracts

The IFRS 17 Contractual Service Margin: A Life Insurance Perspective (Sections 2-4.8 only)

CIA Educational Note: IFRS 17 – Fair Value of Insurance Contracts

Commentary on Question:

This question tested the candidates' understanding of IFRS17 concepts, including actuarial valuation techniques to measure fair value of insurance contracts.

Solution:

- (a)
 - (i) Describe the two actuarial valuation techniques that would be consistent with the income approach to measure the fair value.
 - (ii) Recommend an actuarial valuation technique for the acquired block of policies. Justify your answer.

Commentary on Question:

Performance was mixed for part (i). Most candidates listed the two actuarial valuation techniques, but few provided sufficient descriptions to receive full credit.

Candidates who were able to name the actuarial techniques in part (i) generally performed well on part (ii) by referring to the context and recommending the valuation technique for the acquired block of policies.

3. Continued

- (i) The first approach is the adjusted fulfilment cash flow (adjusted FCF) approach. Under the adjusted FCF, the IFRS 17 FCF are adjusted to reflect the perspective of a market participant (IFRS 13) rather than the entity's view (IFRS 17) and to include other IFRS 13 requirements not included in the IFRS 17 fulfilment cash flows.

The second approach is the appraisal value (AV) approach. The AV can be defined as the price established by a prospective buyer to acquire a block of business. In the context of IFRS 17, the only component of the AV relevant to fair value is the present value of in-force (PVIF). $PVIF = PV(\text{After-tax profits}) - PV(\text{Cost of Capital})$. Using the AV technique, one must solve for the amount of assets that would be just enough such that $PV(\text{After-tax profits}) = PV(\text{CoC})$, thus Contractual Service Margin (CSM) = $PV(\text{CoC}) - PV(\text{After-tax profits embedded in the FCF})$. CSM can be viewed as the required amount of assets a market participant needs to provide for CoC and any profit shortfall (or excess) not embedded in the FCF.

- (ii) Given we have previous work done on the projected FCF and CSM provided by external consultants, the first approach, adjusted FCF, is a better choice for ABC Life as it leverages on IFRS 17 concepts.
- (b) Critique the following statements related to the risk adjustment (RA) and CSM:
- (i) *ABC Life makes an adverse mortality assumption change relating to future service on a block of written business that was previously expected to be profitable. A negative CSM is established due to the adverse assumption change and will be amortized through the remaining period.*
- (ii) *The positive reinsurance CSM calculated at initial recognition for reinsurance contracts held will be recognized in the profit or loss (P&L) statement on a gradual and systematic basis over time, but the negative reinsurance CSM calculated at initial recognition should be recognized immediately.*
- (iii) *Due to the changes in the economy, ABC Life decides to revise the discount rates used for the CSM calculation and the impact will be recognized in P&L over time via CSM amortization.*
- (iv) *ABC Life recently reinsured a block of business. The direct best estimate liability (BEL) has been recalculated to reflect risk mitigation from the reinsurance.*

3. Continued

Commentary on Question:

Candidates performed well on parts (i) and (ii). Full marks were awarded for indicating that the statement was false accompanied by a clear rationale.

For part (iii), some candidates received partial credit only if VFA was mentioned, as this is a block of whole life products from the context and GMM would be assumed for the block.

For part (iv), most candidates stated direct BEL would be unaffected by the presence of reinsurance and therefore received partial credits. Candidates who also mentioned that reinsurance hedge may affect the level of compensation required on direct contract received full credits.

- (i) False. When an insurer recognizes that its written business, previously expected to be profitable, is now loss-making (e.g. due to changes relating to future services), the insurer is not allowed to spread the expected losses for that business over time and instead must recognize the losses immediately. It will do so by first extinguishing the CSM and then establishing a Loss Component (LC) in respect of the remaining excess losses.
- (ii) False. When an insurer (or reinsurer) purchases reinsurance, it is not allowed to recognize the expected net cost or net gain for that contract immediately, instead, it must spread that net cost or net gain over time. The reinsurance CSM can only be recognized in the profit or loss statement on a gradual and systematic basis over time, as when reinsurance services are received.
- (iii) False. The discount rate used for CSM calculation is a financial assumption and thus should be locked in for subsequent CSM calculations.
- (iv) False. The direct BEL and RA would be unaffected by the presence of reinsurance unless the reinsurance hedge affects the level of compensation required on the direct contract.

4. Learning Objectives:

1. The candidate will understand and apply valuation principles to individual life insurance and annuity products issued by international life insurance companies.

Learning Outcomes:

- (1a) Describe the appropriate IFRS 17 accounting and valuation standards for life insurance and annuity products.
- (1b) Evaluate the appropriate IFRS 17 accounting and valuation standards for life insurance and annuity products.

Sources:

1-01 - IAN 100 Application of IFRS 17 (Chapter 1, Section A – Introduction to GMM only, Chapter 5, Chapters 7 – 9, and Chapter 16)

1-03 - The IFRS 17 Contractual Service Margin: A Life Insurance Perspective (Sections 2-4.8 only)

1-04 - IFRS 17 – Coverage Units for Life and Health Insurance Contracts

1-06 - CIA Educational Note - Discount Rates for Life and Health Insurance Contracts

Commentary on Question:

This question tests the candidate's knowledge of IFRS17 valuation as it applies to par products. It also tests the candidate's knowledge of CSM amortization using coverage units via calculations, and the principles behind setting up illiquidity premiums in determining discount rates.

Commentary is listed underneath question component.

Solution:

- (a) JRT Life launched a new participating whole life product in December 2025. A significant portion is ceded to a Canadian reinsurer. The product is classified as a Direct Participating Contract (DPC).

Critique the following statements:

- (i) *JRT Life has decided to use the General Measurement Approach to value this product.*
- (ii) *JRT Life will aggregate the December 2025 issues with all policies issued in 2026.*
- (iii) *JRT Life must use the bottom-up discount rate method for determining the insurance contract liabilities for this product.*

4. Continued

- (iv) *The reinsurance contract held for this product is classified as a DPC and measured accordingly.*
- (v) *The CSM for this product is adjusted to reflect changes in fulfilment cashflows.*
- (vi) *JRT Life uses risk mitigation techniques and so must put all the changes in underlying items due to financial risk through profit and loss.*

Commentary on Question:

- (i) *Candidates did well on this subpart, correctly identifying that the use of the VFA method was not optional.*
 - (ii) *Candidates did well on this subpart, though some lost marks for indicating contracts must be issued in the same calendar year, not within the same 12-month period.*
 - (iii) *Candidates did well on this subpart, noting that reinsurance contracts cannot be DPCs.*
 - (iv) *Candidates performed poorly on this subpart, failing to note that the CSM was adjusted even if the changes were not related to future service.*
 - (v) *Candidates performed poorly on this subpart.*
- (i) This statement is not appropriate as contracts that are DPCs are accounted for using the VFA.
 - (ii) This statement is not appropriate as groups of contracts can include contracts issued no more than 12 months apart.
 - (iii) This statement is not appropriate there is no specific guidance on which method to use - the company may choose a method to use.
 - (iv) This statement is not appropriate as reinsurance contracts held may not be measured using VFA.
 - (v) This statement is correct - under VFA, unlike GMM, changes in FCF due to financial risk, even if not related to future service, adjust CSM.
 - (vi) This statement is incorrect - under the risk mitigation exception, the company can choose to put **some or all** of the changes in the entity's share of the underlying items due to the effect of the time value of money and financial risk through profit or loss instead of the CSM.
- (b) List the three key principles to follow when determining the illiquidity premium for the discount rate.

Commentary on Question:

Candidates performed poorly on this part. Most candidates were able to identify the first principle but struggled to recall the remaining two.

4. Continued

1. Maximize the use of observable inputs and reflect current market conditions.
2. Exercise judgment to assess the degree of similarity between the features of the insurance contracts and assets with observable prices and make further adjustments as needed.
3. For illiquidity premiums beyond the last observable point, the entity might place more weight on long-term estimates than on short-term fluctuations.

(c) You are given the following information:

Face Amount (FA)	10,000
Opening CSM	200
Annual decrement	6%
Interest accretion rate	2%
Changes relating to future service from favorable mortality assumption update at beginning of Year 5	50

You are also given the following insurance finance expense in the table below:

Period	1	2	3	4	5	6	7	8	9	10
Insurance finance expense	6.0	5.4	4.8	4.2	3.6	3.0	2.4	1.8	1.2	0.6

Calculate the profit realized at the end of years 1 to 10. Show all work.

Commentary on Question:

Candidates typically performed well on this part. Candidates were given full credit for accounting for the changes relating to future service from favourable mortality assumption changes at either the beginning or the end of the period. Some candidates lost credit for mixing the two approaches – i.e., releasing the change in CSM at the end of period 5 but not accreting interest.

Candidates discounting coverage units were also given full credit when applied correctly.

	Period	1	2	3	4	5	6	7	8	9	10
(1)	Face Amount	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
(2)	Survival Prob	100%	94%	88%	83%	78%	73%	69%	65%	61%	57% = (1-decr)^(period - 1)
(3)	Ins Fin Exp	6.0	5.4	4.8	4.2	3.6	3.0	2.4	1.8	1.2	0.6 given in qtn
(4)	Current Service	10000.0	9400.0	8836.0	8305.8	7807.5	7339.0	6898.7	6484.8	6095.7	5729.9 = (1) * (2)
(5)	Current + Future service	76897.5	66897.5	57497.5	48661.5	40355.6	32548.2	25209.1	18310.4	11825.6	5729.9 = SUM((4) from curr prd to end)
(6)	CSM Amort Factor	13%	14%	15%	17%	19%	23%	27%	35%	52%	100% = (4) / (5)
(7)	Opening CSM	200.0	177.5	155.6	134.3	113.6	143.5	113.3	84.0	55.3	27.3 = open val at t = 1, then = prior prd end CSM
(8)	CSM with Interest accretion	204.0	181.0	158.7	137.0	115.9	146.3	115.6	85.6	56.4	27.9 = (7) * (1 + DiscRate)
(9)	CSM Amortized	26.5	25.4	24.4	23.4	22.4	33.0	31.6	30.3	29.1	27.9 = (8) * (6)
(10)	Change in Future Service	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0 given in the question
(11)	Ending CSM	177.5	155.6	134.3	113.6	143.5	113.3	84.0	55.3	27.3	0.0 = (8) - (9) + (10)
(12)	Profit Realized	20.5	20.0	19.6	19.2	18.8	30.0	29.2	28.5	27.9	27.3 = (9) - (3)

5. Learning Objectives:

2. The candidate will understand international capital requirements, the approaches and tools of financial capital management for international life insurance companies.

Learning Outcomes:

- (2a) Explain and calculate regulatory capital using various international frameworks.
- (2b) Explain and evaluate the respective perspectives of regulators, investors, policyholders and insurance company management regarding the role and of capital.

Sources:

NEW-OSFI Guideline LICAT-Nov 2024 – Chapters 1 to 6

Commentary on Question:

This question was designed to assess the candidate's ability to apply the five risk categories to the product in question (single premium payout annuities).

Solution:

- (a) Assess the capital the company is required to hold for each of the five risk components of the Life Insurance Capital Adequacy Test (LICAT) base solvency buffer (BSB).

Commentary on Question:

Many candidates named and described the 5 risk categories but did not adequately apply the risk categories to the product in question. A few candidates mentioned items like lapse risk which is not relevant for single premium payout annuities.

The five risk components of the LICAT solvency buffer are the following: Insurance risk, Market risk, Credit risk, Segregated Fund Guaranteed risk, and Operational risk. The following considerations are applicable for this company:

- Insurance risk

The main insurance risk affecting single premium payout annuities is the longevity risk. Higher longevity than expected implies having a higher liability for the company. Longevity risk capital is calculated as the sum of the level and trend risk capital. There is no lapse risk for annuities in the payout phase.

5. Continued

- Market risk

The market risk that would be most relevant is interest rate risk as the company invests in fixed income securities. As the insurance cashflows will be paid out for an extended period of time and there are no recurring premiums for the existing policies, there could be extensive losses coming from changes in interest rates if the duration or shape of the asset cashflows is different from the duration or shape of the liability cashflows. The required capital for interest rate risk is calculated as the maximum loss under four different prescribed stress scenarios. Currency risk may also be applicable if the sovereign bonds are in the different currency from the liabilities.

- Credit risk

The credit risk for the investment grade securities is determined as a factor multiplied by the balance sheet value of the asset. This factor will depend on the issuer credit rating and the duration of the asset. The factor for the sovereign fixed income securities would be zero.

- Segregated Fund Guaranteed risk

None, as the company does not sell segregated fund products

- Operational risk

Operational risk is the risk related to running the business. The operational risk for annuities is likely less compared to other types of life insurance as the majority of business operation is comprised of making regular payments to customers and thus relatively simple.

(b) Calculate the following using the information provided in Excel:

- Tier 1 Capital
- Tier 2 Capital
- Core Ratio

Commentary on Question:

Candidates generally struggled with this question. Many were able to apply the LICAT ratio formula, however failed include CSM in Tier 1 Capital, or did not correctly compute Tier 1 deduction and credit risk requirement from the temporary Deferred Tax Asset (DTA).

Refer to the Excel spreadsheet for detailed solution.

5. Continued

- (c) Evaluate the impact of declaring a cash dividend of 1.5 million assuming internal targets are 150% of the LICAT supervisory targets.

Commentary on Question:

Many candidates were able to subtract 1.5m from retained earnings, however very few recognized its impact on Tier 1 deduction (e.g. DTA). One can simply copy and paste the calculation from part (b), subtract 1.5m from the retained earnings input and let the full recalculation flow through.

Refer to the Excel spreadsheet for detailed solution.

Internal Target of 150% of LICAT supervisory

LICAT supervisory target is 70% Core Ratio, 100% Total Ratio

The Internal Target Total Ratio is 150% which is lower than the calculated ratio.
The Internal Target Core Ratio is 105%, which is higher than the calculated ratio.
The company should not issue the declared dividend as the calculated Core Ratio of 104.65% will breach its internal target.

6. Learning Objectives:

1. The candidate will understand and apply valuation principles to individual life insurance and annuity products issued by international life insurance companies.
4. The candidate will understand value creation and inforce management techniques for life and annuity products.

Learning Outcomes:

- (1a) Describe the appropriate IFRS 17 accounting and valuation standards for life insurance and annuity products.
- (4a) Describe and evaluate fundamental strategies for enhancing value and profitability through active in-force and operational management.

Sources:

1-03 - The IFRS 17 Contractual Service Margin: A Life Insurance Perspective (Sections 2-4.8 only)

1-04 - IFRS 17 – Coverage Units for Life and Health Insurance Contracts

4-08 - Impact of 2017 Tax Changes on Life Insurance, Sun Life Financial

4-09 - Chapter 9, IIT

Commentary on Question:

This question was designed to assess candidates' ability to apply IFRS 17 principles to both traditional life and universal life products. Overall, candidates performed well on part (a), but had more difficulty with part (b), particularly part (b)(ii).

Solution:

- (a) Calculate the Contractual Service Margin (CSM) amortization for years 1 to 5.

Commentary on Question:

Many candidates demonstrated a solid understanding of how assumption changes affect CSM roll forward. However, to gain full credit, candidates need to demonstrate that expense assumption changes are incorporated into the CSM calculation after interest accretion but before amortization, ensuring the ending CSM reflects all relevant updates for the period.

6. Continued

Year	1	2	3	4	5
Face Amount	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00
Account Value	1,000.00	1,060.00	1,123.60	1,191.02	1,262.48
Death Benefit	1,200.00	1,200.00	1,200.00	1,200.00	1,262.48
Profitability of Survival (i_{p_x})	1.00	0.96	0.92	0.88	0.85
Current Service (Cu_t)	1,200.00	1,152.00	1,105.92	1,061.68	1,072.28
Current + Future Service	5,591.88	4,391.88	3,239.88	2,133.96	1,072.28
Contractual Service Margin (CSM) Amortization factor	0.21	0.26	0.34	0.50	1.00
Opening CSM	-	64.40	48.70	19.70	10.15
New business CSM	80.00				
Interest Accretion (Insurance finance expense)	2.00	1.61	1.22	0.49	0.25
Changes related to future service			(20.00)		
CSM amortization	(17.60)	(17.32)	(10.21)	(10.05)	(10.40)
Ending CSM	64.40	48.70	19.70	10.15	-
CSM amortization	(17.60)	(17.32)	(10.21)	(10.05)	(10.40)

- (b) Critique the following statements in relation to the taxation of this group of UL contracts. Justify your answer:
- (i) *The accumulating fund for the exempt test policy should reflect an interest rate assumption consistent with the expected growth rate of the product's account value.*
 - (ii) *Compared to using a lower lapse rate, the assumed 100% lapse rate at the end of the 5th year permits policyholders to deposit more premium in the first five years on a tax advantaged basis.*
 - (iii) *To compute investment income tax (IIT), life investment income is the product of a prescribed yield and the account value of the contracts.*

Commentary on Question:

Many candidates performed well on Part (i). However, Part (ii) was generally not well answered. Rather than providing a focused explanation for why the lapse assumption does not increase tax advantaged premium capacity, many candidates relied on memorized rules such as the 8% and 250% rules or general tax concepts. The question required a clear understanding of the mechanics of Accumulating Fund and Net Premium Reserve, which was seldom demonstrated. For Part (iii), while many candidates correctly identified maximum tax actuarial reserve as a component of the IIT calculation, full credit requires that the prescribed yield is applied to the average maximum tax actuarial reserve.

- (i) False - The legislation defines the interest rate should be using a fixed assumption of 3.5% for the post 2016 policies when measuring the Accumulating Fund (AF).

6. Continued

- (ii) False - The Accumulating Fund (AF) of the actual policy is based on the greater of the Cash Surrender Value (CSV) and the Net premium Reserve (NPR); more premiums will increase the CSV, but the NPR does not reflect lapses, meaning a higher assumed lapse rate such as 100% at the end of year 5 does not reduce the NPR and therefore does not create more room.
- (iii) False - An insurer's life investment income is the product of a prescribed yield and the insurer's average maximum tax actuarial reserves for its taxable life insurance policies for the year. (These reserves are determined without reference to any policy loans or reinsurance arrangements.)