

Exam ILA 201 I

Date: Tuesday, March 24, 2026

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 6 questions numbered 1 through 6 with a total of 50 points.

The points for each question are indicated at the beginning of the question.

2. While every attempt is made to avoid defective questions, sometimes they do occur. If you believe a question is defective, the supervisor or proctor cannot give you any guidance beyond the instructions provided in this document.

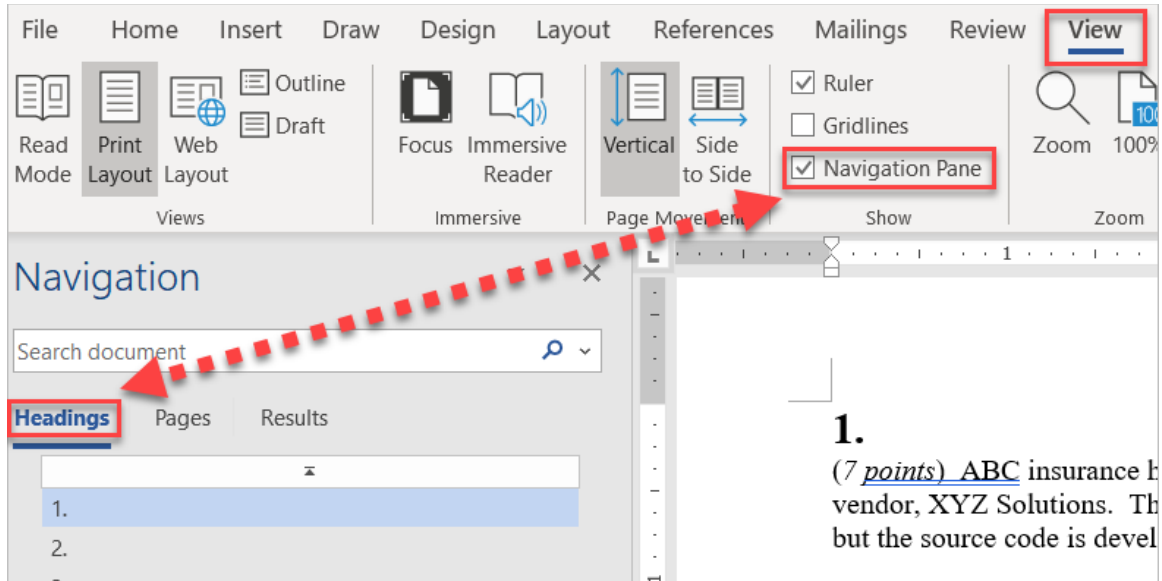
Written-Answer Instructions

1. Each question part or subpart should be answered either in the Word document or the Excel document as directed within each question. Graders will only look at work in the indicated file.
 - a) In the Word document, answers should be entered in the box marked ANSWER within each question. The box will expand as lines of text are added. There is no need to use special characters or subscripts (though they may be used). For example, β_1 can be typed as beta_1, and x^2 can be typed as x^2.
 - b) In the Excel document formulas should be entered. For example, $X = \text{component1} + \text{component2}$. Performing calculations on scratch paper or with a calculator and then entering the answer in the cell will not earn full credit. Formatting of cells or rounding is not required for credit.
 - c) Individual exams may provide additional directions that apply throughout the exam or to individual items.
2. The answer should be confined to the question as set.
3. Prior to uploading your Word and Excel files, each file should be saved and renamed with your unique candidate number in the filename. To maintain anonymity, please refrain from using your name and instead use your candidate number.
4. The Word and Excel documents that contain your answers must be uploaded before the five-minute upload period expires.

Navigation Instructions

Open the Navigation Pane to jump to questions.

Press Ctrl+F, or click View > Navigation Pane:



1.

(11 points)

(a) (4 points) Critique the following statements:

- (i) (1 point) *The S&P 500 Index can be used as a benchmark to determine the base cost of capital.*

ANSWER:

- (ii) (1 point) *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.*

ANSWER:

- (iii) (1 point) *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.*

ANSWER:

- (iv) (1 point) *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.*

ANSWER:

(b) (3 points) 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

1. Continued

- (i) (1 point) Calculate economic value.

The response for this part is to be provided in the Excel spreadsheet.

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

The response for this part is to be provided in the Excel spreadsheet.

- (c) (4 points) 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.

ANSWER:

2.

(6 points)

(a) (2 points) Critique the following statements. Justify your answer.

- (i) (1 point) *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.*

ANSWER:

- (ii) (1 point) *Mortality should be a blend of company and industry data, and higher weight should be given to the company's own experience.*

ANSWER:

(b) (4 points) 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

- (i) (2 points) Propose modifications to the IFRS 17 risk adjustment for each of the above product changes. Justify your answer.

ANSWER:

- (ii) (2 points) Propose modifications to the IFRS 17 discount rate for each of the above product changes. Justify your answer.

ANSWER:

3.

(6 points) ABC Life is a multi-national insurance company based in Canada. A block of whole life policies has been recently acquired. External consultants have provided the projected fulfilment cash flows (FCF) and contractual service margin (CSM) for the block.

(a) (2 points)

- (i) (1 point) Describe the two actuarial valuation techniques that would be consistent with the income approach to measure the fair value.

ANSWER:

- (ii) (1 point) Recommend an actuarial valuation technique for the acquired block of policies. Justify your answer.

ANSWER:

(b) (4 points) Critique the following statements related to the risk adjustment (RA) and CSM:

- (i) (1 point) *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.*

ANSWER:

- (ii) (1 point) *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.*

ANSWER:

3. Continued

- (iii) *(1 point) 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.*

ANSWER:

- (iv) *(1 point) ABC Life recently reinsured a block of business. The direct best estimate liability (BEL) has been recalculated to reflect risk mitigation from the reinsurance.*

ANSWER:

4.

(11 points) JRT Life is a Canadian life insurance company.

- (a) (6 points) 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) (1 point) *JRT Life has decided to use the General Measurement Approach to value this product.*

ANSWER:

- (ii) (1 point) *JRT Life will aggregate the December 2025 issues with all policies issued in 2026.*

ANSWER:

- (iii) (1 point) *JRT Life must use the bottom-up discount rate method for determining the insurance contract liabilities for this product.*

ANSWER:

- (iv) (1 point) *The reinsurance contract held for this product is classified as a DPC and measured accordingly.*

ANSWER:

- (v) (1 point) *The CSM for this product is adjusted to reflect changes in fulfilment cashflows.*

ANSWER:

4. Continued

- (vi) (1 point) *JRT Life uses risk mitigation techniques and so must put all the changes in underlying items due to financial risk through profit and loss.*

ANSWER:

JRT Life wants to add a T100 product to its product offering. JRT Life will use the bottom-up approach to determine its discount rate.

- (b) (1 point) List the three key principles to follow when determining the illiquidity premium for the discount rate.

ANSWER:

- (c) (4 points) 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.

The response for this part is to be provided in the Excel spreadsheet.

5.

(9 points) Your company sells only single premium payout annuities. It invests in only investment grade or sovereign fixed income securities.

- (a) (4 points) 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).

ANSWER:

- (b) (3 points) Calculate the following using the information provided in Excel:

- Tier 1 Capital
- Tier 2 Capital
- Core Ratio

The response for this part is to be provided in the Excel spreadsheet.

- (c) (2 points) Evaluate the impact of declaring a cash dividend of 1.5 million assuming internal targets are 150% of the LICAT supervisory targets.

The response for this part is to be provided in the Excel spreadsheet.

6.

(7 points) You are given the following information for a group of universal life (UL) contracts:

Face amount (FA)	1,200
Initial account value (AV)	1,000
Annual account value growth	6%
Payment upon death of the insured	Max (FA, AV)
Annual decrement for mortality & lapse	4%
Lapse rate assumed at the end of 5 th year	100%
Locked-in rate	2.5%

At initial recognition:

PV(premium) discounted using locked-in rate	2,000
PV (claims and expenses) discounted using locked-in rate	1,900
Risk adjustment	20

In year 3, a change to the expense assumption increased the fulfillment cash flow (FCF) by 20

- (a) (4 points) Calculate the Contractual Service Margin (CSM) amortization for years 1 to 5.

The response for this part is to be provided in the Excel spreadsheet.

6. Continued

(b) (3 points) Critique the following statements in relation to the taxation of this group of UL contracts. Justify your answer:

(i) (1 point) *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.*

ANSWER:

(ii) (1 point) *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.*

ANSWER:

(iii) (1 point) *To compute investment income tax (IIT), life investment income is the product of a prescribed yield and the account value of the contracts.*

ANSWER:

*****END OF EXAMINATION*****