

Exam CFE 101

Date: Monday, March 23, 2026

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 5 questions, numbered 1 through 5 with a total of 50 points.

The points for each question are indicated at the beginning of the question. Question 5 pertains to the Case Study.

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.

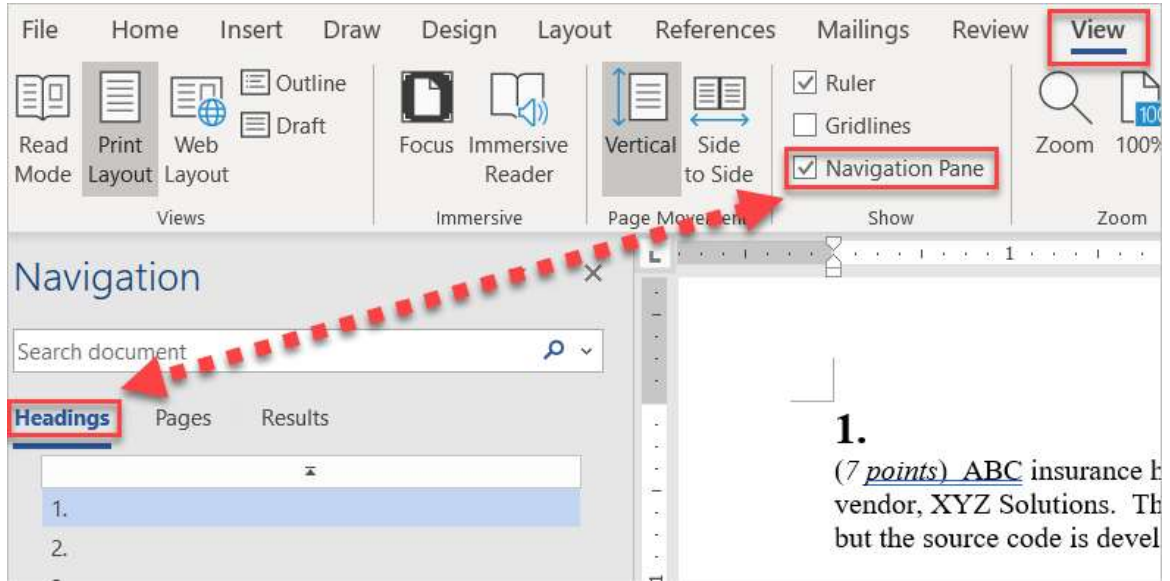
Written-Answer Instructions

1. Each question part or subpart should be answered either in the Word document or the Excel file as directed. Graders will only look at work in the indicated file.
 - a) In the Word document, answers should be entered in the box marked ANSWER. 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 ^ used to indicate a superscript).
 - b) In the Excel document formulas should be entered. 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) For each question part requiring an answer in Excel, (1) clearly identify the inputs to the calculations, (2) show the necessary interim calculations, adding rows and / or columns, if necessary, and (3) enter the final answer in some or all of the cells highlighted in yellow, as applicable in each circumstance. These cells should contain formulas with links to other calculations in the worksheet. Minimize the use of hard-coded figures and maximize the number of interim steps in the calculations that would demonstrate your line of thinking.
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 files 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:



CASE STUDY INSTRUCTIONS

The case study will be used as a basis for some examination questions. Be sure to answer the question asked by referring to the case study. For example, when asked for advantages of a particular plan design to a company referenced in the case study, your response should be limited to that company. Other advantages should not be listed, as they are extraneous to the question and will result in no additional credit. Further, if they conflict with the applicable advantages, no credit will be given.

1.

(10 points) XYZ is a global reinsurer based in the United States with subsidiaries in over 15 countries across the globe. XYZ reinsures a variety of risks including life, health, and property & casualty. You are XYZ's CRO.

XYZ has planned to expand its business into a small tropical island, Tropica, located in the middle of the Atlantic Ocean, and it has invested significant resources in the project. In 2023, a tsunami hit Tropica and caused huge losses. Due to a lack of workforce, Tropica still hasn't fully recovered from the damage. Destroyed health facilities are still under construction. About 20% of the farmland was destroyed and has not been restored.

Due to the current resource limitations on Tropica, the CEO of XYZ is concerned about compounding risks but would still like to assess whether the expansion is viable. The CEO asks you to analyze the risks XYZ might face once it expands into Tropica.

(a) (4 points)

(i) (2 points) Provide one relevant example for XYZ for each of the three types of compounding risk.

ANSWER:

(ii) (2 points) Recommend one strategy to strengthen XYZ's risk management for each risk in part (i). Justify your answer.

ANSWER:

1. Continued

- (b) (2 points) The CEO wants more information about risks that may emerge for XYZ if it moves forward with the expansion into Tropica.

To evaluate emerging risks, an analyst on your team, Chris, suggests using a Bow-Tie diagram because it is a linear Cause-and-Effect model that helps users visualize emerging risks. She believes this method will help the CEO to better understand emerging risks.

Another analyst, Kyle, recommends using Scenario Analysis. He mentions that this is a simple but powerful method where XYZ can identify the two or three most likely scenarios and then allocate resources evenly among them to effectively prepare for emerging risks.

- (i) (1 point) Critique Chris' suggestion.

ANSWER:

- (ii) (1 point) Critique Kyle's suggestion.

ANSWER:

- (c) (1.5 points) XYZ's CEO has now switched his focus to regulatory capital. Tropica is subject to European Solvency II capital requirements. The CEO asks you to calculate how much more capital XYZ needs to meet the Solvency Capital Requirement.

Refer to tab "Q1.c" of the Excel spreadsheet.

You are given:

- XYZ follows the standard Basic Solvency Capital Calculation method.
- Your assistant provided the correlation matrix shown in the Excel file for use with the Solvency Capital Calculation.
- You are given the capital amount provided in the Excel file for each risk.

Calculate the additional capital XYZ needs to satisfy the Solvency Capital Requirement. Show your work.

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

1. Continued

- (d) (2.5 points) Recommend to the CEO whether XYZ should move forward with its expansion in Tropica. Justify your answer using all of the analysis from parts (a) through (c).

ANSWER:

2.

(11 points) SHL Life Insurance Company, an established insurance provider of life insurance products, has recently launched a new business unit. The company's management decided to use Embedded Value as a metric to evaluate the profitability and the value generated for the shareholders over the next 3 years.

In a project meeting, your colleagues shared their perspectives on Embedded Value:

- **Statement A:** "Since Embedded Value and stock price are correlated, a higher Embedded Value will directly lead to an increase in the company's stock price."
- **Statement B:** "Changes in Embedded Value are mainly driven by economic factors such as investment returns and discount rates, while non-economic factors like policyholder behavior and mortality assumptions play a more limited role."
- **Statement C:** "Management compensation should be tied to changes in Embedded Value, as it best aligns the interests of executives with those of shareholders."
- **Statement D:** "Embedded Value is a comprehensive measure of an insurance company's worth, making it an appropriate basis for determining goodwill in acquisition transactions."

- (a) (2 points) Evaluate each of the four statements by identifying one valid point and one invalid point. Justify your assessment.

ANSWER:

2. Continued

(b) (4 points)

You are given:

- Opening Free Capital: \$30 million
- Opening Locked-In Capital: \$0 million
- Hurdle Rate: 10%

Amounts in \$ million	After-Tax Profits	After-Tax Investment Income on Capital	Increase in Locked-In Capital
Year 1	\$5	\$2.0	\$5
Year 2	\$6	\$2.2	\$4
Year 3	\$7	\$2.5	\$3
Year 4	\$0	\$0.0	-\$12

Refer to tab “Q2.b” of the Excel spreadsheet.

(i) (2 points) Calculate the Embedded Value at time 0 using the Profits to Shareholders Method. Show your work.

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

(ii) (2 points) Calculate the Embedded Value at time 0 using the Cost of Capital Method. Show your work.

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

2. Continued

- (c) (5 points) In Year 2, the regulator in SHL’s state of domicile is considering a revision to the capital adequacy framework, which would reduce required capital levels. SHL currently maintains a solvency ratio well above the regulatory minimum.

Refer to tab “Q2.c” of the Excel spreadsheet.

- (i) (1 point) Analyze how the lower capital requirement impacts the calculation of Embedded Value.

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

The CFO is considering adjusting the company’s capital strategy in response to the upcoming regulatory changes. The management team is evaluating the following three proposals:

- Proposal A: Increase shareholder dividends and share buybacks to enhance investor returns.
- Proposal B: Invest in riskier asset classes, such as high-yield bonds or equities, to improve investment income.
- Proposal C: Expand into new product lines with different risk characteristics, such as variable annuities or long-term care insurance.

- (ii) (4 points) Evaluate the three proposals in terms of impact on risk profile of SHL and potential impact on Embedded Value by completing the chart in tab “Q2.c” of the Excel spreadsheet. Justify your response.

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

3.

(12 points) ABC Life is a small life insurance company which offers both level term and whole life products. ABC has received a strong credit rating, “A with stable outlook”, from a local rating agency. ABC plans to leverage this strong credit rating to help raise capital and improve sales.

ABC plans to grow aggressively and add more products in the next few years. It currently sells its products through an in-house sales team and an independent financial advisory channel - One IFA.

You are a pricing actuary at ABC Life and have recently completed its annual lapse experience study. You have observed that ABC’s term product, Easy Term, is showing a higher-than-priced-for lapse rate, especially for policies renewing after the first year. You are concerned that continued low persistency for Easy Term might lead to challenges in maintaining its financial position, potentially leading to a ratings downgrade by the local rating agency.

(a) (4 points)

(i) (2 points) Evaluate the expected impact of a rating’s downgrade on the following aspects of ABC Life’s business operations.

1. Raising Capital
2. Sales

ANSWER:

(ii) (2 points) Propose two drivers, other than sales distribution and producer incentives, that might be contributing to the higher observed lapse rates. Justify your response.

ANSWER:

3. Continued

On further analysis of the lapse experience study, you find that persistency of business sold by One IFA is lower than persistency for business sold by the in-house team.

Currently, ABC and One IFA have a Service Level Agreement (SLA) which specifies that ABC Life will provide marketing materials to One IFA and perform reviews every three years on One IFA's sales practices. This SLA has not been reviewed or revised in the past few years to keep it in line with new, stricter regulations related to sales incentives, commission clawbacks and advisor training.

ABC's CEO has suggested hiring ACE Insurance Consulting to help with analyzing ABC's arrangement with One IFA.

ACE Insurance Consulting is known for expertise in managing product portfolios, risk management and strategic turnarounds.

(b) (6 points) ACE has started analyzing One IFA's effectiveness in selling the Easy Term product and is evaluating shortfalls which might be affecting persistency for Easy Term.

(i) (2 points) Describe the Principal-Agent Problem and how it applies to ABC Life in this situation.

ANSWER:

(ii) (2 points) Describe two actions for each of the following that, if taken by One IFA, could lead to conduct risk for ABC.

1. Sales Incentives
2. Advisor Training

ANSWER:

3. Continued

(iii) (2 points) Evaluate whether each of following is an appropriate area of focus for ACE. Justify your response.

- Commission and commission clawback rules in the outdated SLA.
- Sales training conducted by the One IFA for selling Easy Term by its sales team.
- Administrative system used by the One IFA to record sales of Easy Term and report to ABC.

ANSWER:

(c) (2 points) ACE is currently developing a report following its assessment of ABC's sales distribution channels and the impact on the overall persistency for ABC's term product.

Propose three actions, based on the preceding analysis, that ACE can recommend to ABC to improve persistency for Easy Term. Justify your response.

ANSWER:

4.

(7 points) You are a consultant who specializes in Economic Capital. The CRO of MEK Bank is concerned that the Value at Risk (VaR) framework used for estimating economic capital might be hiding problematic scenarios in the tail of the loss distribution. Therefore, he is considering switching from VaR to Expected Shortfall (ES) for the economic capital calculations of MEK. The CRO has approached you to understand the implications of this change.

(a) (3 points)

Refer to the tab labeled “Q4.a” in the Excel spreadsheet.

(i) (1 point) Calculate the Economic Capital for MEK using both VaR and ES at a 99.5% confidence level. Show your work.

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

(ii) (2 points) Calculate the Diversification Benefit for both measures. Show your work.

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

(b) (4 points) An analyst has alerted you that the total simulated losses for the four scenarios with the highest total losses were each underestimated by 50 million Euros. No other errors were found. The CFO would like to understand the impact of the corrected losses.

(i) (2 points) Evaluate (qualitatively) the impact of the corrected data on VaR, ES, and their respective diversification benefits.

ANSWER:

(ii) (2 points) Evaluate whether to shift from VaR to ES as a risk measure used for Economic Capital for MEK considering the results obtained.

ANSWER:

Question 5 pertains to the Case Study

5.

(10 points) Giant Auto Motors (GAM) is implementing a Voluntary Buyout Window (VBW) through its pension plan to help derisk the Company.

Refer to Section 1.6 of the Case Study.

Main Features of the VBW:

- Participants with deferred pension rights can elect to receive their pensions in a single payment (the Buyout), rather than as an annuity.
- Buyouts are available on a strictly voluntary basis as required under federal law.
- The Buyout Window (election period) will remain open from July 1, 2026, to September 30, 2026.
- Buyout payments will be made directly from GAM pension assets on July 1, 2027, nine months after the Buyout Window closes.

Statutory Buyout Valuation Assumptions

- Discount rates based on duration matched AA bond rates on September 30, 2026, using rates published by the IRS.
- Unisex mortality rates (50/50 blend of male/female), using tables published by the IRS.

Other:

- Percent of eligible group assumed to elect the Buyout: 70%.
- Estimated Buyout disbursements payable July 1, 2027: \$12 billion.
- Pension asset allocation: 80% liability matching assets, 20% return seeking.

5. Continued

(a) (4 points) You are advising GAM on risks associated with the VBW initiative.

(i) (1 point) Identify one financial risk associated with the VBW that cannot be effectively mitigated. Justify your response.

ANSWER:

(ii) (2 points) Identify one financial risk associated with the VBW that can be mitigated and recommend an appropriate risk mitigation strategy. Justify your response.

ANSWER:

(iii) (1 point) Identify one non-financial risk associated with the VBW that can be mitigated and recommend an appropriate risk mitigation strategy. Justify your response.

ANSWER:

5. Continued

- (b) (6 points) The CFO of GAM asks you to conduct a risk impact assessment following the completion of the Voluntary Buyout Window (VBW), using a July 1, 2027, measurement date.

Assume the following:

- The June 30, 2027, Corporate and Pension Balance Sheet entries are equal to the values provided in Section 1.6 of the Case Study.
- Lump Sum payments totaling \$12 billion are made on July 1, 2027.

Refer to tabs “Q5.b.i”, Q5.b.ii”, and “Q5.b.iii” in the Excel spreadsheet.

- (i) (1 point) Calculate GAM pension plan’s surplus and funding ratio after the VBW. Show your work. Refer to tab “Q5.b.i” in the Excel template.

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

- (ii) (1 point) Calculate GAM’s corporate debt-to-equity (D/E) ratio under the current accounting standards (FAS 158 and IAS 19) before and after the VBW. Show your work. Refer to tab “Q5.b.ii” in the Excel template.

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

- (iii) (1 point) Calculate GAM’s corporate debt-to-equity (D/E) ratio under the Augmented (or Holistic) Balance Sheet approach, before and after the VBW. Show your work. Refer to tab “Q5.b.iii” in the Excel template.

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

- (iv) (1 point) Evaluate which balance sheet method, mentioned in (b)(ii) or (b)(iii), provides a more informative view of the economic impact of the VBW on GAM’s corporate leverage.

ANSWER:

- (v) (2 points) Evaluate the impact of the VBW on three key stakeholders, considering the findings from above.

ANSWER:

****END OF EXAMINATION****