

Exam CFED

Date: Friday, October 28, 2022

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has 9 questions numbered 1 through 9 with a total of 100 points.

The points for each question are indicated at the beginning of the question. Questions 1-2, 4-7, and 9 pertain 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.

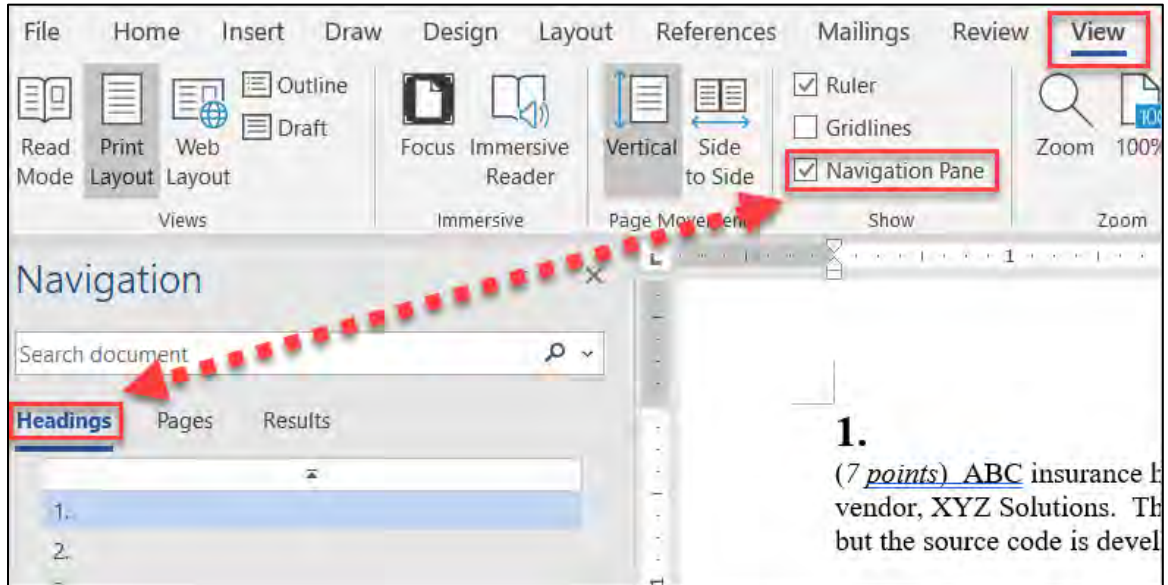
Written-Answer Instructions

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) 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 five-digit candidate number in the filename.
4. The Word and Excel files that contain your answers must be uploaded before time 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.

Question 1 pertains to the Case Study.

1.

(8 points) You are an analyst working for the independent auditing firm hired to review Blue Jay Tire's (BJT) financial statements (Case Study section 3.5). You are aware of the reputational damage done by the BJT tire recall and understand this could be a motivation to issue poor quality financial reports.

- (a) (1 point) List three accounting techniques companies can use to improve their financial position in the current reporting period.

ANSWER:

You decide to investigate possible financial warning signs by analyzing a time series of three metrics:

- Net income versus cash flow from operations
- Inventory turnover ratio
- Receivables turnover ratio

- (b) (3 points)

- (i) Calculate each metric from 2017-2021. Show your work.

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

- (ii) Assess what the results may mean as they pertain to financial warning signs.

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

- (c) (2 points) Recommend three appropriate questions to ask BJT as part of the audit based on your observations in part (b). Justify your recommendations.

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

1. Continued

Your manager states that BJT is likely utilizing a units-of production method for depreciating long-lived assets, which is increasing the firms profit margin in 2020 and 2021, relative to prior years.

(d) (2 points)

- (i) Describe the three methods that can be used for depreciating long-lived assets.

ANSWER:

- (ii) Evaluate your manager's statement based on BJT's financial statements.

ANSWER:

Question 2 pertains to the Case Study.

2.

(11 points) You are an analyst working at Frenz (Case Study section 4). You are asked to assess Frenz's performance, relative to its own past performance and relative to the industry.

(a) (4 points)

- (i) Calculate the Days of inventory On Hand (DOH), Days of Sales Outstanding (DSO), and Total Asset Turnover for the past 5 years. Show your work.

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

- (ii) Evaluate Frenz's operational performance based solely on your calculations in part (i).

ANSWER:

You are provided with the following data about the coffee roaster industry.

	2021	2020	2019	2018	2017
DOH	65.7	63.7	67.5	66.4	66.5
DSO	5.4	5.9	5.5	5.6	5.6

- (b) (2 points) Explain the implications of Frenz's operating efficiency based on the industry ratios above.

ANSWER:

- (c) (1 point) Explain how a change in overhead expense allocation may impact a company's current and future operational results.

ANSWER:

2. Continued

- (d) (2 points) Recommend two actions that Frenz should take regarding operating efficiency. Justify your recommendations.

ANSWER:

- (e) (2 points)

- (i) Calculate Frenz's debt-to-equity ratio over the last 5 years. Show your work.

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

- (ii) Evaluate Frenz's debt-to-equity ratio in part (i) considering the company's expansion plan.

ANSWER:

- (iii) Propose two approaches to reduce the company's internal debt burden.

ANSWER:

3.

(13 points) You are a risk officer for ABC Company, tasked with predicting the likelihood of default on one-year small business loans. You are evaluating two potential models and are given the following:

- The loans total \$100,000.
- The loans have an annual effective interest rate of 10%.
- You assume that ABC is able to recover 40% of the loan value when default occurs.
- You assume that the chance of default (target) is 25%.

The models produce the following results:

	Samples	Precision	Recall
Model 1	100	0.933	0.933
Model 2	100	0.970	0.867

- (a) (1 point) List two key data considerations when designing features of an Analytics Base Table (ABT).

ANSWER:

- (b) (3 points) Create a confusion matrix for Model 1 and for Model 2. Show your work.

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

3. Continued

Management has indicated that they would prefer to evaluate models as follows:

- Models with categorical target features to be based on expected value
- Models without categorical target features to be based on a harmonic mean average class accuracy

Your coworker recommends that you use profit and loss as a performance measure for evaluating the models.

(c) (4 points)

- (i) Evaluate your coworker's recommendation.

ANSWER:

- (ii) Calculate the profit and loss for Model 1 and for Model 2 using the confusion matrices created in part (b). Show your work.

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

(d) (2 points) Recommend whether Model 1 or Model 2 should be adopted by ABC Company. Justify your response, using results from parts (b) and (c).

ANSWER:

(e) (2 points) Determine the annual effective loan interest rate at which the models would produce the same expected profit and loss. Show your work.

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

3. Continued

- (f) (1 point) Recommend one additional performance measure for evaluating the performance of models with categorical target features that management may not have considered. Justify your recommendation.

ANSWER:

Question 4 pertains to the Case Study.

4.

(14 points) Kitty Dunn is reviewing her recent email correspondence with Jeff Bemoski (Case Study section 4.5, Exhibit B).

(a) (2 points)

(i) Describe the agency problem at Frenz, as observed in the email exchange.

ANSWER:

(ii) Describe how Frenz's organizational architecture may reduce agency problems.

ANSWER:

Kitty refines the overhead cost analysis. She establishes the following four cost codes based on product and distribution.

Products	Distribution	Cost Code
Coffee	Frenz Stores	CS
	Other Than Frenz's Stores	COTS
Non-Coffee	Frenz Stores	NCS
	Other Than Frenz's Stores	NCOTS

Kitty reviews the current practice of accumulating all overhead costs in a single pool.

(b) (1.5 points) Describe how each of the four types of overhead costs listed in Kitty's email may be allocated to each of the four cost codes to more accurately reflect how the cost codes consume the overhead resources.

ANSWER:

4. Continued

Kitty has prepared a spreadsheet containing accounting information for the year 2020, as shown in tabs Q4_c-i and Q4_c-ii in the accompanying Excel workbook.

(c) (2 points)

- (i) Calculate Operating Income using an overhead allocation to the four cost codes based on 'Sales'. Show your work.

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

- (ii) Calculate Operating Income using an overhead allocation to the four cost codes based on 'Cost of Sales'. Show your work.

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

4. Continued

In 2021, Kitty prepares the table below to compare Operating Income for the four cost codes under the two overhead allocation bases: 'Sales' and 'Cost of Sales'.

Overhead Allocation Driver	CS	COTS	NCS	NCOTS
Sales	76,632	12,428	10,965	(356)
Cost of Sales	159,461	(52,375)	20,109	(27,527)

(d) (4 points)

- (i) Describe how Jeff's bonus will change if the overhead allocation base is changed from 'Sales' to 'Cost of Sales'.

ANSWER:

- (ii) Critique Jeff's statement regarding the true profitability of the non-coffee items.

ANSWER:

- (iii) Recommend a change to Frenz's product mix based on Kitty's overhead allocation analysis. Justify your recommendation.

ANSWER:

4. Continued

Robert Kaplan, Frenz CRO, recommends that Kitty refine her analysis by considering other cost approaches such as Activity-Based Costing (ABC) or Value Chain Analysis (VCA).

(e) (4.5 points)

(i) Contrast ABC and VCA.

ANSWER:

(ii) Explain why VCA would be suitable for Frenz.

ANSWER:

Question 5 pertains to the Case Study.

5.

(16 points) Seaplane Expeditions and Aviation Company (SEA) is focused on setting up partnerships with larger airline companies to provide regional services in the Pacific Northwest. Blue Jay Air (BJA) has responded with an acquisition offer instead. (Case Study sections 2 and 8)

(a) (2 points)

- (i) Explain one common financial synergy from an acquisition that is unlikely to be realized by the combination of BJA and SEA.

ANSWER:

- (ii) Explain why it is important to identify the control premium versus the synergy premium.

ANSWER:

5. Continued

BJA is evaluating potential control premiums and synergies if it acquires SEA. It is considering the impact of:

- Discontinuing the SEA charter service
- Reducing operating costs
- Expanding in the Pacific NW and internationally

You are provided with a partially-completed Excel calculation tool, containing key assumptions and data on BJA and SEA's free cash flows and assumptions on the combined firm.

(b) (7 points)

- (i) Calculate the annual free cash flow impact of discontinuing SEA charter service by completing the Excel template tab Q5_b-i. Show your work.

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

- (ii) Calculate the annual free cash flow impact for the following aspects by completing the Excel template Q5_b-ii. Show your work.

I. Cost reduction

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

II. Growth in Pacific NW region and international expansion

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

5. Continued

- (iii) Calculate the following by completing the Excel template Q5_b-iii. Show your work.

I. The combined firm's value

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

II. Value of the control premium

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

III. Value of the cost synergy

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

IV. Value of the growth synergy

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

(c) (3 points)

- (i) Recommend to BJA an acquisition price for SEA. Justify your recommendation.

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

- (ii) Analyze whether BJA's acquisition offer is likely to be accepted or rejected by SEA.

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

5. Continued

SEA has identified some risks of this acquisition offer.

- A. SEA believes that the expected international growth could start in year 6 versus year 4, and the projected international growth rate would be a constant of 1.99%.
- B. Potentially the international expansion may not bring any additional revenue growth.

(d) (4 points)

- (i) Recalculate combined firm's synergy premium for each risk, A and B, by using the Excel template Q5_d-i. Show your work.

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

- (ii) Explain how each risk, A and B, could change SEA's decision.

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

Question 6 pertains to the Case Study.

6.

(11 points) During a quarterly business review, the owners of Snappy Life Insurance Company (Case Study section 7) have seen projections that they are on target to meet and possibly even exceed their sales goals for the year.

Due to the sales success, CFO Corrie Caille asks you to lead a task force to find solutions for Snappy's increasing exposure to mortality risk.

The task force meets with Red Rover Reinsurance (RRR) to discuss terms for an Excess of Loss (XOL) Reinsurance deal. RRR has provided the following:

- Each component of the treaty has two options, which can be set independently of each other, resulting in eight possible combinations.
- The reinsurance premium will be 110% of RRR's expected claims.

Treaty Component	Options
Point of Attachment	750 or 1,250
Point of Exhaustion	2,500 or 5,000
Proportion Covered by Reinsurance	40% or 70%

Snappy's head of financial modeling provides the following table for Snappy's expected claims due to mortality (in '000s) and their associated probabilities.

Expected Loss Scenario	Probability of scenario	Expected Claims
High	25%	2,980
Average	65%	2,130
Low	10%	1,450

You are given a table in Excel that develops the net cost of the reinsurance agreement.

(a) (4 points)

- (i) Calculate the missing components of the table found in the Excel file tab Q6_a. Show your work.

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

- (ii) Recommend which option combination Snappy should select, if any. Justify your recommendation.

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

6. Continued

- (b) (1 point) Propose a new set of treaty options, other than the eight combinations above, that Snappy might pursue to improve its mortality risk profile. Justify your proposal.

ANSWER:

Corrie notes that reinsurance may not be the most efficient solution to reduce mortality risk. She recommends investigating securitization as an alternative.

- (c) (4 points)
- (i) Explain two ways securitization can help Snappy address inefficiencies in the reinsurance market.

ANSWER:

- (ii) Assess whether each of Snappy's products is suitable for securitization.

ANSWER:

Corrie would like to use this opportunity to build a case for an ERM approach on risk transfer to educate management on the benefits of ERM.

- (d) (2 points) Explain two benefits to Snappy of implementing an ERM program regarding the selection of risk transfer mechanism.

ANSWER:

Question 7 pertains to the Case Study.

7.

(10 points) Big Ben Bank, based in London, England, is subject to the Basel III accord.

- (a) (1 point) Describe which risks from Case Study section 5.1 are most relevant to Basel III.

ANSWER:

7. Continued

You are given the following table for Big Ben at year-end 2021:

Financial Items	Value (£000,000's)
Tier 1 Capital	1,600
On-balance sheet exposures	27,000
Derivative exposures	13,000
Securities financing exposures	800
Off-balance sheet items	4,000
Stock of high-quality liquid assets	5,000
Total net cash outflows over the next 30 calendar days	1,250
Available amount of stable funding	3,000
Required amount of stable funding	5,000

(b) (2 points)

- (i) Calculate the Leverage Ratio, as defined by Basel III, at year-end 2021 from the table above. Show your work.

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

- (ii) Recommend a risk appetite tolerance level to management regarding the leverage ratio. Justify your recommendation.

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

(c) (3 points) Using the table above,

- (i) Calculate a ratio that measures the short term resilience for the bank. Show your work.

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

- (ii) Analyze Big Ben Bank's long-term resilience relative to the Basel III requirements.

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

7. Continued

RPPC, as the parent company of both Darwin Life (Case Study section 6) and Big Ben Bank, wants to understand how the impact of Solvency II on Darwin Life differs from the impact of Basel III on Big Ben Bank.

- (d) (1 point) Describe two key differences between Basel III and Solvency II as they apply to Big Ben Bank and Darwin Life, respectively.

ANSWER:

You are given the following chart for Darwin Life with capital requirements by level of confidence. Darwin Life currently finds itself at the 75% level of confidence.

Risk	75% Confidence (\$000,000)	80% Confidence (\$000,000)	99.5% Confidence (\$000,000)
Non-life underwriting risk	0	0	0
Life underwriting risk	250	280	540
Special health underwriting risk	20	30	40
Market risk	340	390	600
Counter-party default risk	90	130	220
Operational risk	170	260	390

- (e) (3 points) Recommend specific changes, if any, that RPPC would require of Darwin under Solvency II to reach the Solvency Capital Requirement (SCR). Justify your recommendation.

ANSWER:

8.

(12 points) You recently joined ABC Bank as a risk analyst, and your first project is to assist your manager with stress testing.

- (a) (1 point) Describe two benefits and two challenges of performing stress testing.

ANSWER:

You are preparing the scenarios for the stress testing. Your manager suggests the following approach:

“All the stress scenarios should be based on actual historical events. When things have truly happened in the past it gives us more confidence that they will happen again. Also, do not stress more than one risk factor in these scenarios, as it will increase the complexity but not add much value.”

- (b) (1 point) Propose a better method for developing stress scenarios than was suggested by your manager. Justify your answer.

ANSWER:

After running all the stress scenarios, your manager wants to know what the portfolio would look like under the worst-case scenario. He gives you the following information and asks you to determine the potential maximum loss of the portfolio.

- Current portfolio value: \$1.7 Million
- Delta of portfolio: \$0.5 Million
- Gamma of Portfolio: \$4.4 Million

- (c) (2 points)

- (i) Estimate the worst-case scenario result using the information provided. Show your work.

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

- (ii) Explain the estimation method you used in part (i) in the context of scenario analysis.

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

8. Continued

After one year, your manager wants to evaluate the stress testing results you had previously completed. He creates the following table that compares the prior work with the actual results over the year.

Scenario	Description	Interest Rate	Market Index	Gain/Loss (\$ Millions)
Expected – 1 year ago	Baseline	5%	5,000	\$14
Stress test – 1 year ago	Interest Rates -200 bps	3%	5,000	\$4
	Market Index -10%	5%	4,500	\$9
	Credit Downgrade	5%	4,700	\$10
	Operational Risk Event	5%	5,000	\$7
Actual Result		4%	4,800	\$6

(d) (1.5 points) Evaluate the stress testing results using the information provided.

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

Senior management thinks that actual results this year were heavily influenced by the following:

- Customers bringing a class action lawsuit against the company, and
- Unfavorable hedge cash flows

(e) (2 points) Design an approach to help validate the hypothesis of senior management. Justify your recommendation.

ANSWER:

8. Continued

Senior management wants to be able to understand the attribution of risks based on their stress testing results.

(f) (2 points) Recommend one improvement to each of the following that accomplishes this goal going forward:

(i) the current stress testing approach

(ii) the current scenario set

Justify your recommendations.

ANSWER:

Currently, some of the stress testing process takes too long because of using the median result from a large set of stochastic scenarios.

(g) (2.5 points)

(i) Describe how predictive modeling could be used to address this challenge.

ANSWER:

(ii) Explain why the predictive model could go stale over time.

ANSWER:

(iii) Describe three ways to extract a signal indicating that the model might go stale.

ANSWER:

Question 9 pertains to the Case Study.

9.

(5 points) Blue Jay Air (BJA) (Case Study section 2) has decided to acquire Seaplane Expeditions and Aviation Company (SEA) (Case Study section 8).

- (a) (1 point) Evaluate if BJA should structure SEA as a subsidiary versus fully integrating SEA into BJA.

ANSWER:

Upon acquisition, SEA's executives would be offered one of two possible compensation packages if they are retained.

Package	Base Salary	Stock Option	Pension and other Deferred Compensation
A	10%	70%	20%
B	20%	10%	70%

- (b) (1 point) Recommend which executive compensation package SEA's executives should choose if they are retained. Justify your recommendation.

ANSWER:

9. Continued

Assume BJA offered SEA existing executives compensation package B. Executives at SEA are now asked to review and prioritize the following projects (Case Study section 2.5).

- I. Upgrade fleet
- II. Enhance booking system
- III. Improve business lounges
- IV. Discontinue travel agency programs
- V. Discontinue free luggage check-in

- (c) (2 points) Explain how the compensation structure may affect the preference of the SEA executives for each of the projects above.

ANSWER:

Assume the acquisition price is USD10,000,000.

- (d) (1 point) Recommend a suitable financing approach BJA can use for the acquisition of SEA. Justify your response.

ANSWER:

****END OF EXAMINATION**