Exam CFESDM

AFTERNOON SESSION

Date: Thursday, October 31, 2019
Time: 1:30 p.m. – 3:45 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This afternoon session consists of 4 questions numbered 6 through 9 for a total of 40 points. The points for each question are indicated at the beginning of the question. Questions 6 through 9 pertain to the Case Study, which is enclosed inside the front cover of this exam booklet.

2. Failure to stop writing after time is called will result in the disqualification of your answers or further disciplinary action.

3. 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 on the exam booklet.

Written-Answer Instructions

1. Write your candidate number at the top of each sheet. Your name must not appear.

2. Write on only one side of a sheet. Start each question on a fresh sheet. On each sheet, write the number of the question that you are answering. Do not answer more than one question on a single sheet.

3. The answer should be confined to the question as set.

4. When you are asked to calculate, show all your work including any applicable formulas.

5. When you finish, insert all your written-answer sheets into the Essay Answer Envelope. Be sure to hand in all your answer sheets because they cannot be accepted later. Seal the envelope and write your candidate number in the space provided on the outside of the envelope. Check the appropriate box to indicate morning or afternoon session for Exam CFESDM.

6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

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Tournez le cahier d’examen pour la version française.

Printed in the U.S.A.
Exam CFESDM-Front Cover

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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.
Beginning of Examination

Afternoon Session

Beginning with Question 6

Question 6 pertains to the Case Study.
Each question should be answered independently.

6. (9 points) Information on Darwin Life can be found in Section 7 of the Case Study.

Darwin currently holds the following asset portfolio in its UL reserve segment.

<table>
<thead>
<tr>
<th>USD $</th>
<th>Statutory BV</th>
<th>Allocation</th>
<th>Credit Rating</th>
<th>Expected Book Yield</th>
<th>Post Tax Capital Charge (% of BV)</th>
<th>Statutory Capital Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash/Treasuries</td>
<td>96,460</td>
<td>10%</td>
<td>AAA</td>
<td>0.50%</td>
<td>0.000%</td>
<td>Cl0</td>
</tr>
<tr>
<td>Corporate Bonds</td>
<td>1,061,060</td>
<td>50%</td>
<td>AA</td>
<td>2.50%</td>
<td>1.027%</td>
<td>Cl0</td>
</tr>
<tr>
<td>High Yield Bonds</td>
<td>0</td>
<td>0%</td>
<td>BB</td>
<td>7.00%</td>
<td>3.634%</td>
<td>Cl0</td>
</tr>
<tr>
<td>Commercial Mortgages</td>
<td>0</td>
<td>0%</td>
<td>A</td>
<td>5.00%</td>
<td>2.054%</td>
<td>Cl0</td>
</tr>
<tr>
<td>Equities</td>
<td>154,336</td>
<td>8%</td>
<td></td>
<td></td>
<td>7.900%</td>
<td>Clcs</td>
</tr>
<tr>
<td>S&amp;P Derivatives</td>
<td>115,752</td>
<td>6%</td>
<td></td>
<td></td>
<td>0.316%</td>
<td>Cl0</td>
</tr>
<tr>
<td>Interest Derivatives</td>
<td>231,504</td>
<td>12%</td>
<td></td>
<td></td>
<td>0.316%</td>
<td>Cl0</td>
</tr>
<tr>
<td>Credit Default Swaps</td>
<td>270,088</td>
<td>14%</td>
<td></td>
<td></td>
<td>3.634%</td>
<td>Cl0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,929,200</strong></td>
<td><strong>100%</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statutory Equity</td>
<td>109,200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The statutory required capital formula for Darwin is

\[
\begin{align*}
C_{10} &= \sqrt{(C_{10} + C_{3a})^2 + C_{1cs}^2 + C_2^2}
\end{align*}

where:

\[
\begin{align*}
C_{10} &= \text{Invested asset risk; calculated as post-tax capital charge x BV} \\
C_{3a} &= \text{Interest rate risk} = 9,646 \\
C_{1cs} &= \text{Equity risk; calculated as post-tax capital charge x asset value} \\
C_2 &= \text{Insurance Risk} = 19,292
\end{align*}
\]
6. **Continued**

(a) *(1 point)*

(i) Calculate the statutory required capital for this segment.

(ii) Calculate the statutory capital ratio (Statutory Equity / Required capital) for this segment. Statutory equity is 109,200.

Anne Košky, VP Life Insurance, suggests replacing some of the investment grade corporate bonds with high yield bonds and commercial mortgages to enhance asset yield on both the existing portfolio as well as the forthcoming new business launch.

Roger Heilman, Chief Corporate Actuary, notes that a statutory capital ratio of at least 250% is required to maintain Darwin’s AA Financial Strength rating.

(b) *(1 point)* State the objective function.

(c) *(2 points)* State three constraint functions that would need to be considered by Darwin. Justify your answer.

Assume that Darwin will only invest in Corporate Bonds and High Yield Bonds.

(d) *(5 points)* Determine a feasible solution along a boundary using two of the constraints identified in part (c) that produces a higher yield than the current portfolio. Justify your answer.
Question 7 pertains to the Case Study.
Each question should be answered independently.

7. (10 points) Information on Frenz can be found in Section 4 of the case study.

Robert Kaplan, CRO of Frenz, would like to use total cost measures to manage Frenz’s supply-chain risks and proposes using a Supplier Performance Index (SPI) model to better understand the costs of doing business with these suppliers on a continuous basis.

Frenz currently utilizes two suppliers in Costa Rica: Luna Beans, and Vida Coffee. Information for Luna Beans and Vida Coffee is provided below. Information for all of Frenz’s coffee bean suppliers, including the two aforementioned suppliers, is also provided.

<table>
<thead>
<tr>
<th></th>
<th>Luna Beans</th>
<th>Vida Coffee</th>
<th>All Bean Suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deliveries</td>
<td>900</td>
<td>40</td>
<td>2600</td>
</tr>
<tr>
<td>Total Value of Deliveries</td>
<td>$97,600,000</td>
<td>$2,400,000</td>
<td>$205,400,000</td>
</tr>
<tr>
<td>Cost from Late Deliveries</td>
<td>$1,740,000</td>
<td>$310,000</td>
<td>$13,380,000</td>
</tr>
<tr>
<td>Cost from Bean Shortages</td>
<td>$1,090,000</td>
<td>$0</td>
<td>$9,810,000</td>
</tr>
</tbody>
</table>

(a) (1 point) Calculate the SPI for Luna Beans and Vida Coffee. Show your work.

(b) (1 point) List two drawbacks of using SPI.

(c) (2 points)

(i) Calculate an adjusted SPI using the Q adjustment factor. Show your work.

(ii) Interpret the adjusted SPI results.

The four typical features of vertical market failure are provided below:

I. Low Number of Buyers and Sellers
II. High Asset Specificity
III. High Transaction Frequency
IV. Uncertainty, Banded Rationality, and Opportunism
7. Continued

(d) (2 points) Determine whether each of these four features are relevant for Frenz’s proposed Vietombia project. Justify your answer.

Other than pursuing a strategic alliance with the government of Vietombia, CRO Robert Kaplan would like to know what other cooperative strategies are available for Frenz to be able to offer the Vietombia Finca Palmilera coffee bean. Luna Beans and King Coffee are two companies that may cooperate with Frenz. More information about them is available in the case study.

(e) (4 points)

(i) Identify which company is the best candidate for an alliance for Frenz to be able to offer the Vietombia Finca Palmilera. Justify your response.

(ii) Identify a type of corporate-level cooperative strategy that Frenz could pursue with the company selected in part (i). Explain how the proposed strategy would work.

(iii) Describe one advantage and one disadvantage of the strategy proposed in part (ii) over the strategy with the government of Vietombia outlined in the case study.
8. (10 points) Information on Blue Jay Tire (BJT) can be found in Section 3 of the case study.

BJT produces three types of tires: car, truck, and specialty. The budgeted overhead for the production of tires is $2.5 million.

<table>
<thead>
<tr>
<th>Tire Type</th>
<th>Car</th>
<th>Truck</th>
<th>Specialty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted Units</td>
<td>30,000</td>
<td>15,000</td>
<td>5,000</td>
<td>N/A</td>
</tr>
<tr>
<td>Budgeted Time per Unit (minutes)</td>
<td>20</td>
<td>45</td>
<td>90</td>
<td>N/A</td>
</tr>
<tr>
<td>Budgeted Volume (hours)</td>
<td>10,000</td>
<td>11,250</td>
<td>7,500</td>
<td>28,750</td>
</tr>
</tbody>
</table>

During 2018, the actual overhead incurred was $2.8 million and the following number of units were produced.

<table>
<thead>
<tr>
<th>Tire Type</th>
<th>Car</th>
<th>Truck</th>
<th>Specialty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Units</td>
<td>33,000</td>
<td>10,000</td>
<td>10,000</td>
<td>N/A</td>
</tr>
<tr>
<td>Standard Volume (hours)</td>
<td>11,000</td>
<td>7,500</td>
<td>15,000</td>
<td>33,500</td>
</tr>
</tbody>
</table>

For parts (a) and (b) only, assume BJT treats all their overhead expenses as a variable expense based on volume:

(a) (1 point) Determine whether the overhead account is under- or over-absorbed. Show your work.

There are three components to variance of the absorbed amount:

I. Spending
II. Efficiency
III. Volume

(b) (2 points) Calculate the variance components (I to III) of the absorbed amount.
Jane Mulroney has expressed concerns that $1.5 million of the budgeted expenses should be categorized as fixed expenses. The recalculated overhead variances using this basis are shown below:

Overhead Spending Variance = + $152,174
Overhead Efficiency Variance = – $17,391
Overhead Volume Variance = – $247,826

(c) (1.5 points) Explain the change of each variance component, with respect to its favorability or unfavorability, after the re-allocation of $1.5 million to fixed expenses.

Mulroney’s compensation is partially based on the number of tires sold.

(d) (1.5 points) Explain how Mulroney’s compensation influences her decision regarding the classification of the $1.5 million in expenses using the absorption costing system.

(e) (1.5 points) Recommend one change to Mulroney’s compensation based your answer in parts (c) and (d). Justify your answer.

(f) (1.5 points) Sketch the Decision Management Versus Decision Control model as it relates to the classification of the $1.5 million in expenses.

(g) (1 point) Recommend a change to the decision-making process based on your answer in part (d).
Question 9 pertains to the Case Study. Each question should be answered independently.

9. (11 points) Information on Darwin Life Insurance Co can be found in Section 7 of the Case Study.

(a) (2 points) Identify the business-level strategy for each of the following opportunities being considered by Darwin. Justify your answers.

(i) Development of a digital distribution platform

(ii) Organic growth generated by the innovation program

(b) (6 points) Explain how the adoption of each of the two strategies described in part (a) would change Darwin’s competitive position among other life insurance companies with respect to the following three aspects of the Five Forces of Competition Model.

a. Threat of new entrants

b. Bargaining power of buyers

c. Rivalry among competitors

Three members of the senior management team were tasked to evaluate both options and provide feedback to help the CEO decide which strategy to pursue:

I. VP, Distributions: “Life insurance is traditionally sold by agents, not bought by the everyday person. Digital distribution does not have the personal touch, how can it convince customers to buy life insurance? Let’s be realistic. The relationships with our agents and brokers are important and have been profitable for us; I value these people and a digital approach is not fair to them. In my opinion, we should pursue the innovation strategy.”

II. VP, Product Development: “Technology identifies the potential customers, and we can follow up with the traditional personal touch. We do not even need the consultants! My team can develop new strategies of targeting the best opportunities through analysis of the data we collect through the digital platform.”
9. Continued

III. **VP, Business Strategy**: “Everyone in the industry is talking about technology. It is all about technology and innovation. Today’s younger generation will be 80% of our target market in 5 years, but we have only made minimal in-roads. We need to make the change now before it becomes too late. Do we want to be the next Kodak?”

(c) (1.5 points) Identify one bias exhibited in each of the three stakeholders’ opinions above. Justify your answer.

(d) (1.5 points) Identify the task role that each member is playing within the senior management team in the context of providing assistance to select the business strategy based on the opinions given above. Justify your answer.

**END OF EXAMINATION**

Afternoon Session
USE THIS PAGE FOR YOUR SCRATCH WORK