EXAMINATION

11 May 2023 (am)

Subject A311 — Actuarial Risk Management Core Principles

Paper Two

Time allowed: Three hours and fifteen minutes (which includes 15 minutes of reading time),

plus an additional five minutes to allow for scrolling on the ASSA Exam Platform

Total marks: 100

INSTRUCTIONS TO THE CANDIDATE

1. *Ensure that you are logged in and authenticated through Examity before you attempt the examination.*
2. *Questions are only available on the ASSA Exam Platform and may not be printed.*
3. *Type all your answers within the ASSA Exam Platform only. No answers in any other format (e.g. handwritten) will be accepted.*
4. *You may not access any file from your computer, use any other computer program (e.g., Email, MS Word or Excel), or open any other browser during the examination.*
5. *You may not use any other material (e.g., a Formulae and Tables book) during the examination. Any such information that may be required will be provided to you in the examination.*
6. *You are strongly encouraged to use the first 15 minutes as reading time only, however, you may start answering the paper whenever you are ready.*
7. *Mark allocations are shown in brackets.*
8. *Attempt all questions.*
9. *Show calculations where appropriate. You may use blank paper to carry out rough work calculations. You may use a calculator from the approved list only.*
10. *You may return to your answers to review and amend during the allotted examination time. Once you are satisfied with your answers you must click on **Finish all and Submit.** Once you have submitted, you will not be able to make any change.*
11. *You must submit all work before the end of the allotted examination time. Take this into account when planning your review and submission. There will be no time announcements.*

Note: Answers will be saved automatically during the examination if you are connected to the ASSA Exam Platform. However, the Actuarial Society of South Africa will not be held responsible for loss of data where candidates have not followed instructions as set out above.

END OF INSTRUCTIONS

QUESTION 1

i. Define the term "economic capital".

[2]

ii. Describe reasons why a company may decide to use the regulator's prescribed model instead of an internal model for calculating capital requirements.

[2]

Company A and Company B are both life insurers operating in the same market and are of comparable size. It is known that Company A reports a significantly lower economic capital requirement than Company B.

iii. Compare features of Company A with Company B, explaining why these may result in a lower economic capital requirement.

[6]

[Total 10]

QUESTION 2

Betasure is a general insurance company writing various lines of business. They are looking to refresh their risk management framework. Their plan is to start with how they identify risks to which the business is exposed.

i. Discuss the techniques they could consider to assist them in risk identification and who might be involved with the process.

[6]

Climate change has been identified as one of the risks that can affect Betasure's business.

ii. Explain three distinct risks that climate change can expose Betasure to. For each risk, briefly propose a risk mitigating action.

[6]

[Total 12]

QUESTION 3

Techbank provides banking services, and its clients are predominantly employed in the technology sector. The bank has, over the past two years, received a massive volume of deposits from its main clients in the technology sector. The bank invested the proceeds of these deposits in liquid, long-term government bonds.

The bank also has a large mortgage book of business with the same clients.

More recently the technology industry has entered a period of decline and these depositors have been recalling their assets at a much faster and higher rate than anticipated. At the same time, both short- and long-term interest rates have risen significantly.

i. Describe the assets and liabilities of this bank and explain what recent events could mean for the bank's solvency and liquidity.

[6]

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ii. Explain how the bank can raise capital using securitization of mortgages and outline the advantages, disadvantages and risks of this approach for Techbank.

[7]

[Total 13]

QUESTION 4

XCredit is a new "small loan" platform that is being designed by a major bank. The vision is that a potential client needs to enter only the most basic personal information on their website and give their consent to access external big data platforms. After stating their loan amount and term, the platform will give them a decision and terms.

i. List the likely information a user would need to enter and suggest how this data might be supplemented with additional information from other sources.

[4]

Key to XCredit's success would be to accurately model expected default probabilities by duration on the proposed loans. To assist in building a model, the bank parent has provided the last ten years' worth of data and experience on their other credit products to XCredit.

ii. Outline how this data might be modified, analysed and used to build a predictive model.

[9]

[Total 13]

QUESTION 5

DeltaSure is a large South African general insurance company insuring all lines of property. The only reinsurance they currently have in place is an annually renewable Catastrophe Excess of Loss (Cat XL) reinsurance agreement. The Cat XL will cover all losses incurred in a 72-hour period as a result of any single event, with a requirement that there must be at least three or more policyholders suffering loss from the same event. The Cat XL structure provides four layers of cover:

- Layer 1: R300m excess R200m
- Layer 2: R1.5bn excess R500m
- Layer 3: R3bn excess R2bn
- Layer 4: unlimited cover above R5bn

Each layer is reinsured separately by a panel of international reinsurers and arranged with the assistance of a reinsurance broker. When there is a claim in a layer, DeltaSure needs to pay a premium to reinstate the cover.

i. Outline the benefits and risks of this reinsurance arrangement for DeltaSure.

[6]

When discussing the upcoming renewal of the Cat XL structure, the reinsurance broker has indicated that it is very likely that the total premiums for the structure will increase drastically. This is even though DeltaSure did not claim against the Cat XL in the current year.

ii. Describe possible reasons why the cost of the structure is rising.

[4]

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iii. Suggest options for DeltaSure to retain some protection against catastrophes, while reducing the price increase of the Cat XL structure for the upcoming year.

[4]

[Total 14]

QUESTION 6

Z-Chat is a new artificial intelligence platform that has taken the world by storm. Trained, using a snapshot of the internet in 2020, it is producing astonishingly human like responses to almost any question posed to it, often quite accurately as well. It can even produce reports, process data, write computer code and build basic models.

KappaLife is a life insurance company writing a range of product lines. They have engaged with the consultancy you work for to assist in reviewing their internal economic capital model and capital management. After playing around with Z-Chat and KappaLife's data, some of your colleagues suggested that the consultancy can save a lot of time, by using the Z-Chat platform's suggestions and modelling output.

i. Discuss the professional considerations you would take into account to decide how to do the consulting work for KappaLife.

[12]

ii. List other areas that actuaries can possibly consult on for KappaLife.

[5]

[Total 17]

QUESTION 7

Rest-insure is a general insurance company specialising in providing comprehensive insurance solutions to the restaurant industry. Their clients range from single hot-dog stands to large restaurant chains.

The insurer was recently approached to consider a proposal to provide property and business interruption cover to a large restaurant in a popular game reserve.

i. State, with reasons, the likely rating factors and policy features that Rest-insure will consider when determining a premium for this proposal.

[8]

As part of Rest-insure's underwriting process, they may send an underwriter to visit the prospective client's premises to inspect the risk.

ii. Explain why underwriting is an essential part of Rest-insure's risk management framework. Where appropriate, comment on how a visit to the client's premises might enhance the underwriting outcome.

[8]

iii. Describe four other general insurance products that a restaurant might require.

[5]

[Total 21]
[GRAND TOTAL 100]

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END OF EXAMINATION

