ACTUARIAL SOCIETY OF SOUTH AFRICA

EXAMINATION

10 May 2024 (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. *The question paper is only available on the ASSA Exam Platform as a PDF download and may not be printed. Copy/paste of questions or parts thereof is allowed from the question paper to your Word answer document only.*
3. *Download the Word answer document template from the ASSA Exam Platform. Save this Word answer document on your desktop using your Candidate Number as filename. You are required to submit your answers in Word format ONLY using this document. No answers in any other format (e.g. handwritten) will be accepted. Save work regularly.*
4. *Ensure that your Candidate Number appears in the "header" of your Word answer document. [Double-click on the header at the top of the Word document, input your Candidate Number only in the header, then press "Esc" to close the header.]* ***Do not use your name or member number anywhere in your Word answer document.***
5. *You may not access any file from your computer, use any other computer program (e.g., Email or Excel), or open any other browser during the examination. Nor may you use Grammarly, Grammarly Premium or similar add-ins. Microsoft Word spellcheck is allowed.*
6. *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 within the examination.*
7. *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.*
8. *Mark allocations are shown in brackets.*
9. *Attempt all questions, starting each on a new page (as provided for in the Word answer document).*
10. *Show calculations where appropriate. You may use blank paper to carry out rough work calculations. You may use a calculator from the ASSA-approved list only.*
11. *Upload your Word answer document only into the ASSA Exam Platform. Once you have uploaded your document, you must click on* ***Finish Attempt*** *to save your document. You will still be allowed to go back and make changes (****Review Attempt****) if you have time.*
12. *Once you are satisfied with your uploaded document, click* ***Finish Attempt*** *and* ***Finish all and Submit****. Once you have submitted, you will not be able to make any changes.*
13. ***You must submit your Word answer document BEFORE the end of the allotted examination time.*** *You should stop writing and start uploading during the last five minutes. Take this into account when planning your review and submission. There will be no time announcements.*

Note: 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. Outline the differences between deterministic and stochastic models.

[2]

ii. List the advantages of deterministic models relative to stochastic models.

[2]

X-Sure is a new insurance company that writes motor and property insurance. The capital modelling team needs to build a model to calculate the net claims impact of catastrophic events that occur with various probabilities (e.g. 1-in-50 years, 1-in-200 years etc.).

iii. Outline the most important features and components that the model should have to achieve the modelling team's needs.

[5]

iv. Discuss the importance of the following considerations when building this and other actuarial models:

a. Model documentation
b. Sensitivity analysis
c. Flexibility

[6]
[Total 15]

QUESTION 2

You work for GrandSure, a large general insurance company with a well-established book of policies. In an internal report you noticed that the company's required profit margin (expressed as a % of earned premium) is not the same for all classes of insurance.

i. Explain the factors that might result in one class of insurance requiring a higher profit margin than another. Use examples where appropriate.

[5]

Their current offerings are targeted at high-income individuals, but they are now considering developing a product targeting the lower-income market.

ii. Discuss the relative advantages GrandSure has in launching a new product compared to a new insurer entering the market for the first time.

[5]

iii. Describe what competitive advantages a new start-up insurer might have relative to GrandSure.

[3]
[Total 13]

QUESTION 3

i. Define "underwriting" as it applies to individuals wishing to take up insurance coverage.

[2]

ii. Describe the term "financial underwriting" and discuss the importance of performing financial underwriting.

[3]

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In a particular territory, underwriting Private Medical Insurance (PMI) by age, gender or current state of health is not permitted by legislation.

iii. Discuss the possible rationale for this legislation and the impact this will have on PMI business in this territory.

[7]
[Total 12]

QUESTION 4

AlphaLife is a life insurance company offering a range of life insurance products. They are busy reviewing the pricing basis of their immediate annuity product.

i. Outline the types of scenarios AlphaLife would test when evaluating the premium robustness of their immediate annuity product.

[5]

ii. List the main expenses involved in running a book of immediate annuities.

[3]

iii. Explain the concept of marginal costing, its benefits, and the circumstances under which it can be applied in determining the price of a product.

[3]
[Total 11]

QUESTION 5

i. Define the principle of indemnity in the context of general insurance and include two examples illustrating the principle.

[2]

BigSure is a general insurance company that offers a wide range of products. One of their products is something called “Prize Indemnity”. It is aimed at businesses that organise sporting events where there is a big prize (like cash or a car) for an attendee achieving a rare “lucky shot”.

Examples include:

- Hitting a hole-in-one in golf.
- A random spectator being selected at a basketball match and making a long-distance shot from the middle of the court.

In return for a premium (determined and paid per event), the insurer will take over the risk of the organiser having to fund the big prize. There will be certain restrictions on the prizes to qualify for cover.

ii. Explain why this cover meets most of the requirements of a valid insurance product. Where appropriate, comment on what restrictions the insurance company may impose.

[11]
[Total 13]

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QUESTION 6

A company pays the full medical scheme contributions on behalf of their retirees after retirement, until their death. The benefit is funded, and the company has set aside assets in respect of this liability which are invested as follows:

- 50% in a portfolio of local and offshore equities
- 50% in a liquid, 10-year conventional government bond.

An actuary has recently conducted a valuation of both the assets and the liabilities and has reported that the assets (valued on a market value basis) significantly exceed the liability which is calculated on a consistent basis.

i. Describe the liability in respect of this benefit.

[4]

ii. Discuss the suitability of the investment strategy in respect of the assets set aside for this liability.

[4]

The financial director of the company has proposed a cashflow matching investment strategy to reduce the risk of a mismatch between assets and liabilities. The proposed strategy is to use only government issued, inflation-linked bonds.

iii. Discuss the benefits of the proposed strategy.

[2]

iv. Discuss the difficulties associated with implementing the proposed strategy.

[4]

[Total 14]

QUESTION 7

You are working for the chief investment officer of an asset management company in South Africa. The fund is investigating the potential to start investing in property. The company has the option to either invest directly into property or indirectly through pooled property funds.

i. Discuss the merits of indirect versus direct property investment for this company?

[6]

It is now a few years later and the company has grown significantly and built up a sizable property portfolio, made up entirely of investments in pooled property funds. The company is now looking to start investing directly in property by buying a shopping centre that is up for sale. The centre has some big retail tenants, some of which are listed retail companies. Your team is tasked with calculating the initial value for the shopping centre and, assuming it is bought, the ongoing valuation of this investment.

ii. Discuss how the actuarial control cycle can be used as a framework for these tasks. Your answer should include comments on the cashflows and assumptions to consider.

[16]

[Total 22]

[GRAND TOTAL 100]

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END OF EXAMINATION