

# Actuarial Society of South Africa

## EXAMINATION

9 October 2020

### Subject A311 — Actuarial Risk Management

#### Paper Two

*Time allowed: Three hours and fifteen minutes*

*Total marks: 100*

#### **INSTRUCTIONS TO THE CANDIDATE**

1. *Ensure that you have your candidate number handy to input as part of the exam.*
2. *Questions are only available in the Exam Platform and may not be printed.*
3. *You are required to submit your answers in this Exam Platform only. You MAY NOT use any other computer program (e.g. MS Word or Excel) during the examination.*
4. *You have 15 minutes at the start of the exam to read the questions. You are strongly encouraged to use this time for reading only, however, you may commence answering the paper whenever you are ready. You then have three hours to complete the paper.*
5. *Mark allocations are shown in brackets.*
6. *Attempt all 8 (eight) questions. Your work is saved automatically during the exam.*
7. *At the end of the exam, if you have time left, you may review and make any changes to your answers. Once you are satisfied with your answers, you need to **Finish all and Submit** your work after which you will NOT be able to make further changes. Take this into account when finishing early - once you have submitted you will not be able to make any more changes.*
8. *It is the student's responsibility to ensure that all work is submitted BEFORE the end of the exam time. Take this into account when planning your review and submission.*
9. *You should use your scrap paper to work on any calculations where this is appropriate.*

**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

Describe and contrast the following characteristics of government bonds and corporate bonds.

- i. Security [3]
- ii. Marketability [2]
- iii. Yield [4]

[Total 9]

### QUESTION 2

Recently a virus outbreak created widespread illness, hospitalisation, loss of life and economic damage to a few first world countries in Europe. Locally, the South African government wants to learn from the European outbreak and subsequent response to plan an appropriate set of actions in the event of that same outbreak happening locally.

Briefly outline how the local circumstances might differ from the European environment and what effect that might have on any actions to be taken.

[Total 8]

### QUESTION 3

MarineSure is a South African general insurance company specialising in writing marine insurance business. It is a subsidiary of a large multi-national insurance group, writing all classes of general insurance. MarineSure is reviewing its insurance programme and it is considering the following options:

- a. Not taking out any reinsurance cover and relying on its parent company to provide a capital injection if it cannot cover its liabilities.
  - b. Purchasing a quota share reinsurance policy from its parent company, under which MarineSure would retain 50% of all risks.
  - c. Purchasing a multi-layer excess of loss reinsurance policy from the reinsurance market, where MarineSure retains a portion of the risk and the reinsurers pick up all claims in their layer up to a certain maximum. The layers and the reinsurers are yet to be decided.
- i. Outline the key risks of marine insurance to MarineSure, giving an example of each. [3]
  - ii. Describe the risks avoided and accepted by MarineSure if they go with option a) above. [3]
  - iii. Discuss the advantages and disadvantages for opting for each of options b) and c), compared with option a). [4]

[Total 10]

**REMEMBER TO SAVE**

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#### QUESTION 4

A fellow student has told you that stochastic models are always better as they provide much richer information than deterministic models.

- i. Define the term “deterministic model” and explain how it is used. [2]
  - ii. Define the term “stochastic model” and explain how it is used. [2]
  - iii. By considering the merits of the two models, evaluate the student’s statement. [8]
- [Total 12]

#### QUESTION 5

- i. List six key risks relating to data in an insurer. [3]
  - ii. A small pension scheme has decided to use data from an industry-wide collection on pensioner data in order to set its valuation assumptions. Discuss the risks and issues arising from the use of this data. [10]
- [Total 13]

#### QUESTION 6

A small life insurance company is selling only conventional life annuities and life insurance to the local target market. Until recently they invested all their assets into equities.

- i. Discuss the potential pitfalls of this investment strategy. [4]
  - ii. List the main factors that the company should consider when designing a new investment strategy. [8]
- [Total 12]

#### QUESTION 7

A life insurance company intends to offer a product with very limited underwriting that pays for a funeral on the death of the life assured(s) as well as a total lump sum of R150,000 to nominated beneficiaries.

Discuss the extent to which this risk meets the required and desired criteria of an insurable risk. Where appropriate, comment on product design features that might be required in this offering.

[Total 13]

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## QUESTION 8

CorpSure is a large insurance company specialising in providing general insurance solutions to businesses through a large network of brokers. They are aiming to be the first local insurer to launch a “Cyber” insurance product. The product would provide cover for losses as a result of unauthorised access or “hacking” of an insured’s computer systems.

- i. List six examples of how a claim may arise in practice. [3]
- ii. Describe how the actuarial control cycle may be used in the design, pricing, and ongoing risk management of the product. [20]

[Total 23]

[GRAND TOTAL 100]

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**END OF EXAMINATION**