

# Actuarial Society of South Africa

## EXAMINATION

8 October 2020

### Subject A311 — Actuarial Risk Management

#### Paper One

*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

Due to recent extreme market volatility, a small insurance company has breached the required solvency capital requirements. The insurance company is therefore at risk of becoming insolvent.

- i. Briefly describe the regulation that monitors an insurance company's solvency. [2]
- ii. Discuss the regulatory intervention, and the consequences thereof, that the insurance company can expect after it breached the regulatory solvency requirements. [6]

[Total 8]

## QUESTION 2

Magna Life is a life insurance company selling underwritten life products. Recently, after announcing a partnership with a large internet company, Magna Life have begun marketing themselves as a "big data driven insurer".

Describe what is meant by "big data", where Magna Life can obtain data and how the data might possibly be used by them.

[Total 8]

## QUESTION 3

- i. Identify and explain which stakeholders ultimately bear the longevity, investment, and expense risks in:
  - a. A sponsor-funded defined benefit scheme [3]
  - b. A defined contribution scheme [3]
  - c. A State-sponsored pay-as-you-go defined benefit scheme [2]
- ii. List six roles the State may play in the provision of retirement benefits. [3]
- iii. List eight ways the South African government regulates the cost or level of life assurance benefits. [4]

[Total 15]

**REMEMBER TO SAVE**

**PLEASE TURN OVER**

#### QUESTION 4

Capital management is a critical function for financial services companies.

- i. Define 'capital management'. [3]
- ii. List a financial services company's major development expenses that will require start-up capital. [3]
- iii. Apart from start-up capital, list and describe the main reasons why a financial services company requires capital. [6]

[Total 12]

#### QUESTION 5

A South African health insurer is contemplating expanding into a neighbouring country, and they plan to offer similar products to those offered in South Africa.

You are completing a project appraisal exercise to determine the viability of the initiative.

- i. List all the cashflows you should consider. [9]
- ii. List four typical appraisal techniques that can be applied to the cashflows identified in i. [2]
- iii. Discuss the factors that should be considered when determining an appropriate risk discount rate. You are not required to comment on the merits of the proposed expansion. [5]

[Total 16]

#### QUESTION 6

- i. List the different approaches to incorporate property investments in your investment portfolio. [2]
- ii. Describe the two main categories of the property market. [2]

A worldwide pandemic has resulted in a complete lockdown of the local economy. Most businesses were forced to close for a period of time, and many companies have enabled their employees to work from home. The general sentiment from business owners is that the work-from-home trend will continue even after the pandemic is something of the past.

- iii. Discuss the impact that the pandemic and the work-from-home trend might have on the property market. Consider the impact on the relevant categories separately. [8]

[Total 12]

**REMEMBER TO SAVE**

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## QUESTION 7

- i. Define the term ‘risk budgeting’ as it relates to investment management and discuss the risk budgeting process.

[4]

In managing an investment fund, managers will often face two conflicting objectives: to ensure security, and to achieve high long-term investment returns.

- ii. Discuss how these two conflicting objectives will affect the key stakeholders differently in with-profit vs conventional (non-profit) insurance products. Also describe the key factors that will influence how these two objectives are balanced.

[8]

The investment policy needs to reflect the extent to which the risks of lower stability and security are accepted in order to aim for higher returns.

- iii. Describe the process followed to establish an investment policy that addresses this balance.

[2]

[Total 14]

## QUESTION 8

MoveSure is a large general insurance company that mainly writes vehicle insurance products. They are considering introducing a car hire option on their vehicle insurance product. In the event that a policyholder damages or loses his vehicle, MoveSure wants to partner with a car rental company to provide the policyholder with a mid-range rented vehicle until such time the vehicle is repaired or replaced. MoveSure wants to annually contract a fixed price per day of rental with the company.

The company intends to provide the benefit by charging a fixed extra monthly amount to all those choosing the option. As an actuary working in pricing for MoveSure, you have been tasked with modelling the premium required to provide this benefit at both a best estimate and 75<sup>th</sup> percentile level.

- i. Outline the data that you would require to perform this exercise.

[3]

- ii. Explain how you will model the required premium for this benefit and highlight any assumptions required.

[9]

After your presentation of results, management feels that the additional premium for this benefit is too expensive.

- iii. Describe actions that can be considered to lower the additional premium.

[3]

[Total 15]

[GRAND TOTAL 100]

**REMEMBER TO SAVE**

**END OF EXAMINATION**