

# Actuarial Society of South Africa

## EXAMINATION

14 May 2020

### Subject A311 — Actuarial Risk Management

#### Paper One

*Time allowed: Three hours and fifteen minutes*

#### **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 Moodle and may not be printed.*
3. *You are required to submit your answers in this Moodle learning 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, but notes may be made. 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 return to your attempt to review and make any changes to your answers. Once you are happy 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 to your answers.*
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

- i. Define self-regulation. [1]
  - ii. List the advantages and disadvantages of self-regulation. [3]
  - iii. Describe the main reasons why industries would choose to self-regulate. [2]
- [Total 6]

## QUESTION 2

- i. Define the terms ‘active management’ and ‘passive management’ as it relates to investment management. [2]
  - ii. Discuss the rationale for and against active management. [3]
  - iii. Describe the terms “strategic risk” and “active risk” as it relates to investment or asset portfolios. [2]
- [Total 7]

## QUESTION 3

You have recently been employed at a small insurance company. You want to incorporate property investments as part of your investment portfolio. You consulted an expert and she suggested that, given the size of your investment portfolio, you will have to consider indirect property investments as an option.

- i. List and describe the main disadvantages of direct property investments that may make it impractical for your investment portfolio. [5]

You have decided that you will invest via a Listed JSE Real Estate Investment Trust (REIT) in order to get the relevant property exposure. Your team has shortlisted two different Company REITs for final consideration, out of which you need to choose the final one.

- ii. List the eight main aspects or characteristics of the Company REITs that will influence your final decision. [4]
- [Total 9]

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#### QUESTION 4

- i. Describe the mark to market approach when valuing liabilities using replicating portfolio methods. [4]

You are the valuation actuary on a retirement fund. The fund provides defined contribution benefits. However, all members also enjoy the benefit of a minimum investment return on their investments once they reach retirement age. The guarantee states that if the investment return during a member's contribution period is less than the corresponding period's inflation rate, then the retirement fund will guarantee a return equal to inflation.

Your colleague stated that the value of this guarantee is fairly easy to calculate as you should simply use the projected inflation rate as the investment return in your valuation process.

- ii. Discuss the merits of your colleague's suggestion. [3]
- iii. Describe an appropriate method to value the guarantee inherent in this retirement fund benefit. [3]

[Total 10]

#### QUESTION 5

For each of the following types of actuarial advice, list the principal stakeholders involved and briefly explain their aims or interests:

- i. Advising the South African government on a new type of savings regime designed to encourage the population of the country to save more for retirement [4]
- ii. Advising a short-term insurance company who wish to offer motor insurance only to those drivers who qualify as 'low-risk' drivers by certain criteria [4]
- iii. Advising the Department of Health on whether a new hospital should be entirely government-built or whether it should be built and financed in conjunction with a private-sector consortium [3]
- iv. Advising the sponsor of a defined benefit retirement fund on the contribution level required [4]

[Total 15]

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## QUESTION 6

A life insurance company is about to enter the annuity market for the first time. It intends to sell non-profit immediate annuities. The company makes use of a sophisticated modelling system.

Show how the actuarial control cycle can be used in the pricing and ongoing financial management of the project, and what uses you would put the modelling system to. Note that you do not need to discuss how the product would be administered.

[Total 18]

## QUESTION 7

LifeCorp is a life insurance company selling a range of underwritten life products. Aside from whole of life and term insurance policies they also sell critical illness products, either as stand-alone policies or as rider benefits to other products.

- i. Discuss why critical illness policies are typically regulated and how LifeCorp may be impacted by regulatory requirements.

[8]

Management has decided to investigate the possibility of adding the diagnosis of Illness X to the list of qualifying conditions covered by the product. You have been tasked with deriving the future incidence rates of this illness to be incorporated in pricing for the local market. LifeCorp's reinsurer has provided you with some historical experience data from another market where Illness X is already being insured.

- ii. Explain how you may use this data to set the required incidence rates.

[8]

[Total 16]

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## QUESTION 8

L-Sure is a life insurance company providing underwritten life products to individuals and groups through a network of brokers. They are the subsidiary of a large, multi-disciplinary financial services group.

- i. List ten examples of sensitive policyholder information that L-Sure may need to process to provide a product to a prospective policyholder.

[5]

L-Sure's management team recently updated the company's internal data governance policy.

- ii. Explain what is meant by a data governance policy, what it contains and how it may affect the operation of L-Sure's underwriting department.

[9]

A colleague recently made the following statement: "Data governance is an example of an expense without any measurable financial benefit to the company."

- iii. Comment on the accuracy of this statement.

[5]

[Total 19]

[GRAND TOTAL 100]

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**END OF EXAMINATION**