

# Actuarial Society of South Africa

## EXAMINATION

2 May 2018

### Subject A301 — Actuarial Risk Management

#### Paper One

*Time allowed: Three hours*

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

1. Candidates will be issued with instructions to log in using a password (which will be provided at the exam center).
2. Candidates are required to submit their answers in Word format only using the template provided. You **MAY NOT** use any other computer program (e.g. Excel) during the examination.
3. Save your work continuously throughout the exam, on your computer's hard drive.
4. You have 15 minutes at the start of the examination 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. You must not start typing your answers until instructed to do so by the invigilator/supervisor.
6. Mark allocations are shown in brackets on exam papers.
7. Attempt all questions, beginning your answer to each question on a new page.
8. Candidates should show 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.**

#### **AT THE END OF THE EXAMINATION**

**Save your answers to the hard drive.**

**Hand in your question paper with any additional sheets firmly attached.**

<p><i>In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.</i></p>
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## QUESTION 1

Short-term interest rates are largely controlled by the government through the central bank's intervention in the money market. List and discuss the three (3) reasons why the government alters interest rates.

[Total 5]

## QUESTION 2

A life insurance company has requested that you assist with their capital management. You have considered a range of capital management tools that are listed below.

Provide an example of each method considered, and clearly describe how it can be used to assist the life insurance company with their capital management.

- i. Securitisation [2]
- ii. Subordinated debt [2]
- iii. Derivatives [2]

[Total 6]

## QUESTION 3

Your friend who is an investment analyst says that the true underlying profitability of a general insurance company will differ from that shown in its published accounts. State whether you agree with her or not and explain why.

[Total 4]

## QUESTION 4

A large company is proposing to introduce a group life assurance scheme for its employees. All employees would pay 1% of their salary as a premium and receive life cover equal to four times their annual salary. Only employees whose cover exceeds R5m will have to undergo medical underwriting. All other employees will get the cover without individual medical underwriting.

- i. Define anti-selection and comment on the anti-selection risk for a life insurance company that provides this cover. [4]
- ii. State, with reasons, which employees are likely to benefit most from this proposed arrangement. [7]

[Total 11]

**REMEMBER TO SAVE**

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## QUESTION 5

- i. Define what is meant by “underwriting” and describe reasons why a commercial building and contents insurer may choose to underwrite their prospective risks. You should comment on how you might apply the underwriting where appropriate. [8]
- ii. Describe the nature of this underwriting expense and comment on how it might be allowed for in the pricing of contracts. [4]

[Total 12]

## QUESTION 6

Lamda Sure is an insurance company selling a wide range of general insurance products.

- i. Explain why a general insurance company needs to hold claims reserves. [3]

Recently it has come to light that there have been substantial irregularities in the calculation of their claims reserves.

- ii. List 6 stakeholders who potentially will be most affected by this and discuss why. [10]

[Total 13]

## QUESTION 7

You are the product development actuary for a large general insurer. Your CEO has written to you and has said that he thinks that the personal motorcar insurance is a dying market as driverless cars will dominate the market going forward. He has asked you to develop a new insurance coverage for driverless cars.

- i. List the perils you might consider covering under this new policy. [3]
- ii. Briefly explain what underwriting (if any) you would propose for this new policy. [2]
- iii. Explain how you would calculate the office premium for this new product, clearly stating any issues you would expect in doing this calculation and how you would deal with them. [9]

[Total 14]

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## QUESTION 8

- i. List the main potential attractions and drawbacks of investing in emerging markets.

[4]

You are working in the investment department of a life insurance company. You have been tasked to introduce emerging markets assets into the investment portfolio. These assets will continue to back the company's liabilities. The Chief Investment Officer's expectation is that this introduction should provide an overall higher expected return profile for the investment portfolio.

- ii. By using the Actuarial Control Cycle as a framework, discuss the main considerations and process you will follow to implement this task and deliver on the Chief Investment Officer's expectation.

[13]

[Total 17]

## QUESTION 9

A company provides income protection products with unemployment being the main risk covered. They are reviewing their investment portfolio that backs the liabilities, and they want to restructure their investment to invest only in an inflation-linked bond issued by the local (provincial) authority.

The coupon and redemption payments will be linked to general inflation. The bond has a unique feature that allows coupons to be payable only when economic growth in the local province is positive.

Discuss the investment and risk characteristics of this bond. Where relevant, discuss whether the characteristic considered will make it an appropriate asset for the company's investment portfolio.

[Total 18]

[GRAND TOTAL 100]

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**END OF EXAMINATION**