

# Actuarial Society of South Africa

## EXAMINATION

3 May 2017

### Subject A301 — Actuarial Risk Management

#### Paper One

*Time allowed: Three hours*

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

1. *Candidates will be issued with instructions to login 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

Describe the terms 'required returns' and 'expected returns' in the context of asset class returns.  
[Total 3]

## QUESTION 2

A pension fund is considering a subset of its liabilities, specifically those that are guaranteed in monetary terms. List and describe three asset-liability matching techniques that can be used for this category of liabilities.  
[Total 6]

## QUESTION 3

List the factors that might influence a person/organisation's risk appetite.  
[Total 3]

## QUESTION 4

Your friend recently joined a company that offers a defined benefit pension fund. Over dinner last night he mentioned to you that since he is now a member of a defined benefit fund, he can rest assured knowing that his benefits are guaranteed and that his retirement is "taken care of".  
Discuss the points you would raise in your response to this statement.  
[Total 7]

## QUESTION 5

An insurance company is considering launching an automated online advice tool that will advise consumers how much insurance they should buy and how much they should be saving for retirement. Your legal department is concerned about the regulation of the tool by the relevant authorities.

- i. State the principal aims of financial market regulation. [2]
  - ii. Give and briefly explain what aspect(s) of regulation the legal department might be concerned about in relation to the tool. [4]
  - iii. The regulator does not currently have formal regulation of these tools. State what forms of regulation they could consider introducing. [3]
- [Total 9]

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## QUESTION 6

In the United Kingdom, many life insurers reinsure 100% of the risk.

- i. List reasons why insurers might follow this route. [2]
- ii. Give the disadvantages of an insurer doing this. [4]
- iii. List reasons why a reinsurer might be prepared to accept this risk. [2]
- iv. State the main disadvantage for a reinsurer accepting this risk. [1]

[Total 9]

## QUESTION 7

You have recently been appointed as the statutory actuary at a small insurance company that focuses only on life, disability and pension benefits.

- i. List the reasons why you might need to calculate reserves. [4]
- ii. The previous statutory actuary used a Discounted Cash Flow method for valuing the liabilities using a risk discount rate. Explain what a risk discount rate is. [3]
- iii. There is a mismatching reserve set up in the accounts and your managing director doesn't understand why there is a need to hold such a reserve. State why it may be needed. [2]
- iv. The experience on your individual lump sum disability product is running much worse than expected. While the premiums have been appropriately adjusted for any new sales, unfortunately the company has guaranteed premium rates for the lifetime of the existing policies. Explain what you as the statutory actuary will need to do to allow for this worsening of experience in the valuation. [5]
- v. You have noticed that the previous statutory actuary never performed an analysis of surplus. Give the reasons why you might perform an analysis of surplus. [4]

[Total 18]

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## QUESTION 8

- i. Define what is meant by risk management and briefly discuss five processes typically involved in the risk management process. [7]
- ii. Explain the difference between managing risks at the business unit level versus at the enterprise level. Comment on the relative merits of each approach. [4]

[Total 11]

## QUESTION 9

You work for SureCorp, a large general insurance company. SureCorp is considering launching a product that will provide farmers with insurance against the losses they might incur as a result of drought or other event(s) reducing the size of their harvest at the end of the season.

Your colleague feels that this risk cannot be taken on by the insurance industry.

- i. Discuss the points you will highlight in reply to your colleague. [12]
- ii. Explain how government might become involved in providing benefits to farmers and how this involvement might impact the product design of the proposed SureCorp product. [4]

[Total 16]

## QUESTION 10

A South African health insurance company is contemplating expanding into a neighbouring country. It is anticipated that similar products will be offered to those currently available in South Africa.

You are completing a project appraisal exercise to determine the viability of the initiative, and are therefore considering the cash flows that can be expected.

- i. List all the cash flows that you should consider. [10]
- ii. List the typical appraisal techniques that can be applied to the cash flows identified in i. [2]
- iii. Discuss the factors that should be considered when determining an appropriate risk discount rate. [6]

[Total 18]

[GRAND TOTAL 100]

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**END OF EXAMINATION**