

Actuarial Society of South Africa

EXAMINATION

3 May 2018

Subject A301 — Actuarial Risk Management

Paper Two

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.*
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.

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.

QUESTION 1

A well established and listed South African company specialises in becoming a global retailer that provides everyday products at affordable prices. Recently a scandal about this company hit the newspapers, implying that there were significant levels of fraudulent activity within the company, possibly involving top management as well. The share price reduced by more than 80% within 2 weeks.

Describe potential reasons why the share price might have reduced.

[Total 6]

QUESTION 2

- i. Define “corporate governance”. [1]
- ii. Describe the aims of good corporate governance. [2]
- iii. Describe the role of non-executive directors in the context of corporate governance. [3]

[Total 6]

QUESTION 3

- i. State four reasons why a life insurance company does medical underwriting before issuing a life insurance policy. [2]
- ii. After completing the medical underwriting process for a prospective life assured, state what options a life insurance company has in using that information. [3]

[Total 5]

QUESTION 4

The actuarial control cycle has as its core a simple approach to problem solving. State the three central parts of the model and explain what each stage includes.

[Total 8]

QUESTION 5

- i. Define the concept of “liability hedging”. [1]

The liability-driven investment team of a life insurance company has decided that they will use full liability hedging or approximate liability hedging as techniques to choose appropriate assets to back its liabilities.

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For each of the products listed below

- a. describe the typical liability cashflows;
 - b. discuss which of the above two hedging techniques will be most appropriate; and
 - c. comment on the typical assets you would expect to back the liability.
- ii. Without-profit pure endowment [2]
 - iii. Regular premium pure endowment with surrender and maturity value linked to a local all-share index [3]
 - iv. With-profit joint life annuity [4]
- [Total 10]

QUESTION 6

- i. Explain why a general insurer may be willing to take on a risk that may be unacceptable for an individual to retain. [3]

Bovinsure is a general insurance company specialising in the insurance of livestock such as cows and sheep. The product may pay out a benefit in the case of an animal dying or being stolen.

- ii. By means of practical examples, show how the product design and/or policy wording can help to address the ideal requirements for this risk to be insurable. [9]
- [Total 12]

QUESTION 7

Delta Life is a small, but fast-growing life insurance company selling life policies in the local market. The company is approaching firms in the private equity market to raise additional funding by issuing debt. You work for one such private equity firm.

- i. List reasons why Delta Life may require additional funding. [3]

You have been assigned to do research on Delta Life that can assist in assessing the viability of this opportunity.

- ii. Outline what information you would want to gather about Delta Life and the debt to be issued. [9]
- [Total 12]

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QUESTION 8

- i. State the advantages and disadvantages of using reinsurance as a risk management tool. [4]
- ii. In the context of reinsurance, define the following terms:
 - a. Cedant
 - b. Retention
 - c. Surplus [3]
- iii. Define Alternative Risk Transfer (ART) and explain what it does. [2]
- iv. Give five examples of ART and include a brief explanation of how each works and what the main benefit is of entering such a transaction. [10]

[Total 19]

QUESTION 9

Zeta Limited is a company sponsoring a pension scheme. All the active members have defined contribution arrangements, but there are currently a few hundred current pensioners on the scheme receiving defined benefits for as long as they or their spouses are alive. These benefits consist of an income benefit linked to CPI as well as a defined percentage contribution to the medical insurance premiums of the pensioner. There are also some deferred members who will be eligible for defined income benefits in the future.

- i. List the investment risks faced by the pension scheme. [5]

Zeta is considering transferring all the defined benefit liabilities to a life insurance company. In exchange for receiving a lump sum from Zeta, the life office will then assume all the future liabilities relating to these members.

- ii. Explain why Zeta Limited may be considering such a transfer. [3]

You are the actuary to one such life office bidding to take over the defined benefits. You have been assigned to build a deterministic model that can be used to calculate how much Zeta must pay your company to take over these liabilities.

- iii. Discuss how you will go about constructing such a model. Your discussion should include what data and assumptions you will require. [11]

Your boss wants you to demonstrate the potential downside risks in this transaction by means of some scenario analysis.

- iv. Outline what scenarios you might need to consider to quantify this risk. [3]

[Total 22]

[GRAND TOTAL 100]

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END OF EXAMINATION