

# EXAMINATION

18 May 2017

## Subject F203 — General Insurance Specialist Applications

*Time allowed: Three hours*

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

- 1. Candidates will be issued with instructions to log-in using a password (which you will be provided with 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 that you have been provided.*
- 4. You have 15 minutes at the start of the examination in which 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 on 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

You are an actuary working for a large reinsurance company writing multiple lines of business in the South African and African markets.

- i.
- a. Define the following terms:
    - Working layer
    - Stability clause
  - b. Suggest reasons why each of the above may be used, and in what circumstances. [5]
- ii.
- c. Describe these two types of reinsurance contracts:
    - Surplus
    - Risk excess of loss
  - d. State the advantages of each of the reinsurance contracts in question ii a) relative to the other for both the insurer and the reinsurer in the context of a portfolio of commercial property insurance. [8]

You are assisting the underwriting department of a reinsurance company. You have been offered participation on a commercial property surplus treaty for the period 01 January 2018 to 31 December 2018. You are provided with the following historic information:

Year	Gross Written Premium	Incurred Losses	Average Rate (Annual Premium/Sum Insured)
2012	R200m	R100m	10%
2013	R300m	R145m	11%
2014	R500m	R900m	12%
2015	R400m	R200m	13%
2016	R500m	R260m	15%
2017 (forecast)	R700m	R450m	17%
2018			18%

In addition the following information is available:

- You have an internal index that shows commercial property losses have increased by 6% per annum for several years.
- A ceding commission of 25% will be payable.
- A profit commission of 20% after 10% reinsurer's expenses will be payable.
- No negative profit commissions can be offset or recouped in following years.

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- iii. Discuss whether you would recommend writing this treaty. Your answer should include the following:
- Performing and showing all calculations
  - Stating any assumptions made
  - Outlining any further analysis required as well as discussing any outstanding issues that need to be addressed
- [15]
- iv. Under the terms of the above treaty the ceding company will provide a half yearly bordereau to the reinsurance company
- a. Explain what is meant by the term bordereau.
  - b. Describe the differences that you might see between the Reinsurance Company and insurance company premium and claim data triangles.

[6]

Your CFO approached you about a ceding company that wants to purchase a reinsurance contract from your company. The terms of the contract proposed are as follows:

The reinsurer agrees to indemnify 100% of the ceding company's aggregate losses between R150m and R200m for calendar year 2018. The ceding company pays R48m for the contract on 01 January 2018. In turn the reinsurer will agree to indemnify the ceding company on the 31<sup>st</sup> of December 2018 for any amounts owed on the contract.

The cedant's history of losses are:

Calendar Year	Aggregate Incurred loss
2013	R140m
2014	R200m
2015	R280m
2016	R210m
2017 (forecast)	R270m

No significant changes occurred in the cedant's book of business from 2013 to 2017. No significant changes are anticipated for 2018.

IFRS 4 states: "*in an **insurance or reinsurance contract**, one party (the insurer) accepts significant insurance risk from another party (the policyholder) by agreeing to compensate the policyholder if a specified uncertain future event (the insured event) adversely affects the policyholder*". Some contracts having the legal form of insurance **may thus not meet that definition**.

- v. Explain whether the cedant will be able to account for the expense of this contract as reinsurance and justify your answer.

[6]

[Total:40]

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## QUESTION 2

Medical professional liability insurance, sometimes known as medical malpractice insurance, is one type of professional liability insurance which protects physicians and other licensed health care professionals (e.g., dentist, nurse) from liability associated with wrongful practices resulting in bodily injury, death, medical expenses and property damage, as well as the cost of defending lawsuits related to such claims.

You are an actuary working for a small general insurance company in South Africa. You have been asked by the CEO and CFO to develop a medical professional protection product to meet the professional indemnity requirements of the medical industry.

- i.
  - a. Describe the following terms:
    - Risk attaching during
    - Losses occurring during
  - b. Describe the merits of each basis when writing medical malpractice insurance and state with reasons the basis you would prefer. [5]
- ii. Discuss the issues involved in developing the product that you would consider in relation to:
  - Licence considerations
  - Marketing the product
  - Product features
  - Distribution channels
  - General administration
  - Pricing
  - Claims
  - Other considerations [20]
- iii. The CEO and CFO were impressed by the points you raised in the development phase of the product. You have now been asked to produce a business plan which they can present to shareholders.
  - a. List the areas likely to be covered in the business plan. [5]
  - b. List the assumptions that you would need to make in preparing the plan. [5]
  - c. List the sources of information you would use to determine your assumptions. [10]

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*Social inflation is the increase in insurance losses caused by such factors as higher jury awards, more liberal treatment of claims by workers' compensation boards, legislated rises in compensation benefit levels, and new concepts of tort and negligence.*

iv. Describe three manifestations of social inflation on medical insurance claims.

[3]

The actuarial students working for you have provided you with the following inflation rates affecting medical malpractice in South Africa:

- Historically (20 years ago) inflation was below 3% per annum.
- The next 10 years saw inflation levels rise rapidly to and fluctuate between 8% and 15%.
- The next 5 years saw inflation levels fall again to fluctuate between 5% and 10%.
- The last 5 years have seen inflation levels increase again to above 15%.

For much of the period of high inflation, real returns on cash and fixed interest assets were nil, whilst other asset categories did provide small positive real returns.

The current expected rate of inflation (implied by comparing respective yields on government fixed interest and index-linked bonds) is approximately 6.6% per annum, with expected rates of return on the various asset categories all between 7% and 12% per annum.

The steering committee that is responsible for the approval of the project is particularly concerned with the possible risks of high future inflation on the profitability of this medical protection product. The steering committee has requested that you provide them with a document in relation to your approach to pricing for this product.

v. Discuss the points you would include in the document relating to allowances for future inflation and investment returns.

[12]

[Total 60]

[Grand Total 100]

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**END OF EXAMINATION**