EXAMINATION

24 May 2019 (am)

Subject F103 — *General Insurance*
Fellowship Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1.   Enter all the candidate and examination details as requested on the front of EACH OF your answer booklets.

2.   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.

3.   You must not start writing your answers in the booklet until instructed to do so by the supervisor.

4.   Mark allocations are shown in brackets.

5.   Attempt all seven (7) questions, beginning your answer to each question IN A SEPARATE BOOKLET.

6.   Show calculations where this is appropriate.

AT THE END OF THE EXAMINATION

Hand in your answer booklets, with any additional sheets firmly attached to the correct booklet, AND this question paper.

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

i. Define the following in the context of payments between a reinsurer and cedant, stating for each the type(s) of reinsurance with which they are commonly associated:

    a. Profit commission; and
    b. Ceding commission.

[4]

A general insurer writes commercial property insurance and has reinsurance treaties in place which operate in the order given below:

- 20% Quota Share; and
- Surplus, which has the following conditions:
  - ➢ A maximum retention limit of $4m; and
  - ➢ A maximum of 7 lines of cover.

The insurer classifies its risks as follows for the purposes of reinsurance:

- Category 1: Covering all risks with a Sum Insured not exceeding $5m. No Surplus reinsurance is used for such risks.
- Category 2: Covering all risks with a Sum Insured above $5m but not exceeding $20m. The EML on each such risk is taken to be 60% of the Sum Insured, and the insurer retains as much of each risk as is possible under the reinsurance arrangement above.
- Category 3: Covering all risks with a Sum Insured in excess of $20m. The EML on each such risk is taken to be 80% of the Sum Insured, and the insurer reinsures as much of each risk as is permissible under the reinsurance arrangement above.

ii. Determine:

    a. The largest risk, in terms of Sum Insured, which the insurer is able to write;
    b. The maximum single recovery possible from the Quota Share reinsurance;
    c. The maximum single recovery possible from the Surplus reinsurance; and
    d. The maximum single claim payable by the insurer net of reinsurance recoveries.

[8]
[Total 12]

PLEASE TURN OVER

QUESTION 2

You are the marketing actuary working in a branch of a reinsurance company which currently only writes life insurance business. You are looking at expanding the business by reinsuring some property and casualty lines of business.

    i.   Outline the main factors you would need to consider before deciding to present a business proposal to the CEO.

[9]

    ii.   Outline the main data requirements you would need to consider in order to price the potential new business appropriately.

[4]
[Total 13]

QUESTION 3

Due to ever-increasing reporting requirements and more stringent deadlines for producing quarterly results, the reserving actuary has asked you as senior analyst to investigate areas of the reserving process that can be made more efficient.

    i.   Suggest and describe briefly potential areas in which a reserving process can be improved through automation.

[6]

    ii.   Describe two diagnostic tests available to an actuary to validate the accuracy of results obtained from an automated reserving exercise, and how they would be applied in practice.

[5]
[Total 11]

PLEASE TURN OVER

QUESTION 4

A summary of the assets of a local general insurance company that specialises in commercial property insurance is provided below:

Assets	31/12/2018
	R millions
Fixed assets	55
Investments:	
Cash	15
Fixed interest	90
Agent balances	37
Current assets	5
Total assets	202

Further analysis reveals that:

- Fixed assets include a small office block occupied by the insurer (R35m) and decorations which include a collection of rare artwork (R15m).
- Fixed interest assets are mostly risk-free with outstanding terms of 1-5 years.
- Premiums written in 2018 were R250m and shareholder funds at 31/12/2018 were R60m.

i. Outline the characteristics of the liabilities and assets, and hence discuss the suitability of the investments made by the insurer.

[8]

A director has suggested that a portion of the fixed-interest asset portfolio should be invested in capital market structures known as sidecars to enhance returns and provide diversification benefits.

ii. Explain what is meant by the financial structure known as a "sidecar".

[2]

iii. Comment on the director's suggestion.

[5]
[Total 15]

PLEASE TURN OVER

QUESTION 5

    i.   List the components of the technical provisions (e.g. IBNR, IBNER etc.) to be calculated when applying the Basic Chain Ladder (BCL) method to:

          a.   reporting year cohorts;
          b.   accident year cohorts; and
          c.   underwriting year cohorts,

    using paid claims data.

[3]

    ii.   Define the IBNER and explain its impact on the claims reserves, calculated using the BCL, when case estimates are considered to be prudent.

[3]

You work for a medium-sized general insurer. You are busy reviewing the sufficiency of the case estimates for the year-end reserving exercise as at 31/12/2018. In order to assist with your investigation you have gathered the following information for a specific class of business:

Year reported	Cumulative paid claims development by year (R'000s)				Case estimates (R'000s)
2015	886	1 703	2 263	2 784	658
2016	1 043	2 011	2 716		1 324
2017	1 208	2 283			1 908
2018	1 143				2 978

- The above claims triangle shows cumulative claims development by the year in which the claim is reported. For example, for all claims reported in 2018, R1 143 000 has been paid as at 31/12/2018.
- The case estimates shown above are the reserves for outstanding reported claims as at 31/12/2018.
- Discussions with the claims team indicate that a tail factor of 10% should be applied when deriving the cumulative development factors from the claims triangle above.

    iii.   Determine the sufficiency of the case estimates from the company's financials by applying the BCL to calculate the IBNER.

[7]

    iv.   Outline two additional investigations you could perform to assess the adequacy of the case estimates.

[2]

A colleague has commented that calculating the IBNER separately is not a worthwhile exercise, as the IBNR calculated using the BCL implicitly includes the IBNER.

    v.   Discuss the validity of this comment.

[3]
[Total 18]

PLEASE TURN OVER

QUESTION 6

    i.   Explain the concepts of moral hazard and fraud as they relate to a general insurer.

                [2]

An insurer suspects a large increase in the level of fraudulent behaviour in the past few years on its motor and household books.

    ii.   Describe four examples of how fraud may be committed in the above products.

                [4]

    iii.   Outline four potential reasons for the observed increase in fraudulent activity.

                [4]

    iv.   Outline the steps to follow in updating the premiums to reflect the effects of claim fraud.

                [4]

                [Total 14]

QUESTION 7

An insurer in a particular country provides a wide range of products, incorporating personal and commercial lines. The company is concerned about the effect of the upcoming elections on its mortgage indemnity guarantee insurance book. The political situation in the country has been stable for decades, but there is the potential for volatility following the upcoming elections.

    i.   State the perils covered and benefits provided by mortgage indemnity guarantee insurance.

                [3]

    ii.   Outline four key risks the insurer may be exposed to on its mortgage indemnity guarantee book of business following the elections.

                [4]

    iii.   Outline the key steps and assumptions in modelling the risk-based capital requirement for this book of business.

                [8]

The regulator has suggested that the capital requirement should be increased due to the uncertainty surrounding the elections.

    iv.   Outline briefly the key points you would make in response to this suggestion.

                [2]

                [Total 17]

END OF PAPER