

EXAMINATION

9 November 2018 (am)

Subject F103 — General Insurance Fellowship Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. Follow log in and saving instructions issued to you at the exam venue.
2. Save your work throughout the exam.
3. You are required to submit your answers in Word format only using the template provided. You **MAY NOT** use any other computer program (e.g. Excel) during the examination.
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 supervisor.
6. Mark allocations are shown in brackets.
7. Attempt all seven (7) questions, beginning your answer to each question on a new page.
8. Show calculations where this is appropriate.
9. If answer booklets are used for any question(s) start each question IN A SEPARATE ANSWER BOOKLET, entering all candidate and examination details on **EACH**.

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

*Check that you have saved your work as per instructions given to you.
Hand in any answer booklet(s) you used, 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

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 of 4 lines of cover;
 - A maximum retention limit of \$40m; and
 - A minimum retention limit of \$8m for each risk reinsured under the surplus treaty.

You have been provided with the following information:

Policy	Sum Insured	Expected Maximum Loss (EML)	Claim
1	\$120m	\$80m	\$100m
2	\$50m	\$40m	\$20m

- i. Determine the maximum and minimum amounts which could be recovered from the surplus reinsurer in respect of each of the above claims.
[7]
- ii. Determine the maximum and minimum EMLs for which the insurer would be able to use all of the surplus lines of cover.
[2]

[Total 9]

QUESTION 2

A reinsurance-pricing actuary is reviewing the non-proportional reinsurance rates for a general insurance company that writes household business.

- i. Outline the steps involved in calculating the burning cost risk premium and discuss the factors to consider when using premium as the exposure measure.
[6]
- ii. Explain briefly the main difference in deriving the risk premium for a stop loss reinsurance contract compared to other excess of loss reinsurance contracts.
[1]
- iii. Outline the process, and important considerations, for deriving the stop loss risk premium.
[5]

[Total 12]

PLEASE TURN OVER

QUESTION 3

You are an actuarial analyst working for a general insurance company which writes direct commercial lines business. You have recently received data relating to the insurer's reinsurance arrangements.

- i. Outline briefly 8 main uses of reinsurance data to the insurer. [4]
 - ii. Outline briefly 4 analyses which could be carried out on the performance of the insurer's reinsurance arrangements. [2]
 - iii. Outline briefly the main risks the insurer faces relating to reinsurance. [5]
- [Total 11]

QUESTION 4

- i. Define what is meant by "Funded accounting" and explain where it is used. [3]

An insurer specialising in personal accident insurance has been preparing its accounts using Funded (or Underwriting Year) accounting. An extract of its financials for the last two years, together with additional information, is shown below:

	2016 (R millions)	2017 (R millions)
Written premiums	100	120
Outstanding claims carried forward	60	72
Commission paid	5	6
Other expenses paid	5	6

You have been given the following additional information about the insurer:

- Ultimate claims are 80% of written premiums, with risk evenly spread over the policy year;
- Assume that policies are written half way through each calendar year on average;
- Assume that 50% of claims are reported and settled within 3 months of an accident, and the remaining 50% are reported and settled within the subsequent 3 months.

The insurer is now required to prepare its accounts on an Annual (or Accident Year) basis.

- ii. Stating any additional assumptions made, prepare the Revenue Account for the insurer on an Annual (or Accident Year) basis for 2017. [8]

One of the directors has suggested that all of the insurer's assets should be invested in index-linked bonds.

- iii. Explain whether this is a sensible investment strategy for this insurer. [5]
- [Total 16]

PLEASE TURN OVER

QUESTION 5

You are a consulting actuary. You have recently acquired a new client in a foreign country, a large general insurer which writes a diverse range of business in a number of territories. You will be performing all actuarial reserving for your client, and you have gathered the following information about your client's business:

- Motor and property insurance constitute the majority of your client's business.
- Your client started selling marine insurance last year in order to diversify its book.
- Your client's country is susceptible to hail storms, which commonly occur in the last three months of the financial year. In the last year there was a severe storm two days before the financial year-end cut-off, which severely affected the motor and property classes.
- Your client has proportional, non-proportional and catastrophe reinsurance in place, and over the past three years your client has steadily been increasing its net retention in order to increase profits.
- In the last year there was a change in the case estimation philosophy from a prudent basis to a best estimate level. This change was applied retrospectively.
- Inflation has been volatile over the past four years due to a weakening exchange rate.
- The underwriting standards for the accident and health class have been relaxed with the result that the premium volumes increased by 50% over the last year.

You are setting the IBNR reserves for regulatory reporting. Current regulation requires that the IBNR reserves are calculated (for all classes of business) as the larger of:

- 10% of the outstanding reported claims reserves; and
- 7% of the previous year's earned premium for the class of business.

The percentages above were set to be appropriate for the average insurer in the market.

- i. Discuss the advantages and disadvantages of this approach for calculating IBNR reserves for regulatory reporting.

[4]

The regulator will be amending current regulation which will require that the IBNR reserves are calculated using generally accepted actuarial principles for regulatory reporting. No other changes to the solvency regime are anticipated.

- ii. Discuss the key considerations that you should take into account when using the Chain Ladder method to set your client's IBNR reserves.

[7]

- iii. Outline another generally accepted actuarial reserving method that you are likely to use on your clients data, indicating when it may be suitable to use that method.

[2]

You have completed the reserving exercise which shows that the claims reserve calculated using generally accepted actuarial principles is 30% higher than under the current formula.

PLEASE TURN OVER

- iv. Discuss the possible implications for your client of calculating the IBNR using generally accepted actuarial principles.

[4]

[Total 17]

QUESTION 6

A general insurer sells both motor and household insurance. As a result of the motor insurance market being particularly competitive the marketing director has proposed that the company offers very low premiums for new motor policyholders, steadily increasing the premiums at subsequent annual renewals leveraging off customer loyalty.

- i. Define what is meant by “persistence”.
- ii. Discuss the advantages and disadvantages of the proposed strategy.
- iii. Define what is meant by “risk-based capital”.
- iv. Outline the potential effect the proposed strategy may have on the company’s free capital.

[1]

[7]

[2]

[4]

[Total 14]

QUESTION 7

A new insurer is entering a competitive private motor insurance market, by offering a motor insurance product where the majority of customer interaction is through an internet/app only; there is no direct interaction with people. The quote process asks only essential questions for rating purposes. All systems have been developed in-house as opposed to purchasing existing insurance software commonly used by other insurers in the industry. This has allowed the insurer to incorporate the ability for policyholders to more easily update details of their cover or cancel at any stage.

- i. Discuss the advantages and disadvantages of this design from a marketing perspective.
- ii. Define what is meant by “anti-selection”.
- iii. Discuss the extent to which the company is exposed to anti-selection.
- iv. Outline how the company might analyse conversion rates (i.e. the rates of conversion from quotations to effecting cover) in order to detect anti-selection.
- v. Outline 5 other distinct key risks the insurer is exposed to, particularly in the early stages of the business. For each risk, outline a strategy for managing the risk.

[4]

[2]

[3]

[2]

[10]

[Total 21]

END OF PAPER