EXAMINATION

12 November 2015 (am)

Subject F103 — *General Insurance* Fellowship Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Use the instructions and password provided at the examination center to log in.*

2. *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.*

3. *Save your work regularly throughout the examination on the supplied computer's hard drive.*

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 on exam papers.*

7. *Attempt all seven (7) 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 AND hand in 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

PropSure is a newly-established general insurer which writes only commercial property insurance.

i. Outline briefly six aspects for which PropSure might be able to receive technical assistance from a pure reinsurance company.

[3]

PropSure put in place reinsurance treaties with Companies A, B and C, which operate in the order given below:

- 20% Quota Share treaty with Company A.
- First Surplus treaty with Company B, having 5 lines and a maximum retention of \$25m based on Expected Maximum Loss (EML).
- Second Surplus treaty with Company C, having 10 lines, which comes into operation only after all of the lines on the first surplus treaty have been exhausted.

ii. Explain briefly how you would expect the surplus reinsurers' claims experience to compare with each other's on the reinsured portfolio.

[2]

During the first month of operations the total Sums Insured written by PropSure was \$2500m with a total EML of \$1700m. Claims on this business subsequently totalled \$140m. These figures include the three policies below, which were the only policies with an EML in excess of \$25m.

Policy	Sum Insured	EML	Claim Amount
1	\$70m	\$50m	\$5m
2	\$400m	\$250m	\$20m
3	\$830m	\$450m	\$40m

In general PropSure retained as much as possible on each risk. However, with policy 3 above it was decided to reinsure as much as the treaties allowed.

iii. Determine the total reinsurance recoveries that PropSure can make, in respect of the business it wrote during its first month, from:

a. Company A;
b. Company B; and
c. Company C.

[6]
[Total 11]

PLEASE TURN OVER

QUESTION 2

Outline eight key factors that could cause differences in the quality of data collected and maintained by the following two general insurers:

- A medium-sized insurer which writes only personal household business directly to the public; and
- A small insurer which writes only professional indemnity business for engineers sold mainly through independent brokers.

[8]

QUESTION 3

You are the actuary to a general insurance company responsible for setting new business premium rates.

i. Outline the requirements of a good rating factor giving examples where relevant.

[7]

ii. Discuss the initial analyses which should be conducted on the data and explain why they are done before conducting a GLM analysis for pricing with multiple rating factors.

[8]

[Total 15]

QUESTION 4

You are an actuary working for Sure4U, which is a small general insurer writing personal lines motor and household lines of business. A firm of consultants has built a capital model which currently only models household buildings insurance. Sure4U now wants to improve the model by adding in household contents and motor lines of business.

i. Define the term "claims characteristics".

[2]

ii. Describe the claim frequency and severity of each of the three modelled classes.

[6]

iii. Discuss the loss components that will need to be modelled separately in order to capture the above claims characteristics adequately.

[6]

iv. Outline how the correlations between the different lines can be allowed for in the capital model.

[2]

[Total 16]

PLEASE TURN OVER

QUESTION 5

i. List and outline briefly four key accounting concepts and principles that are widely used in relation to the preparation of the financial accounts of general insurers.

[4]

DG Insurer, a large insurer that specialises in personal motor and household insurance, is considering diversifying its product offering to include employers' liability insurance. To achieve this exposure, one of the directors has suggested acquiring an insurer with exposure to employers' liability. Extracts from the financial statements of DG and the target company are summarised below.

Profit and Loss Accounts for 2014
(all figures are net of reinsurance)

	DG Insurer	**Company A**
	R millions	R millions
Premiums written	1200	7200
Premiums earned	1150	7950
Claims paid	875	7305
Claims incurred	850	7050
Commission paid	30	576
Other expenses paid	250	450
DAC c/f	10	270
DAC b/f	8	360
Investment Returns (on insurance funds)	35	450
Investment Returns (on SH Funds)	60	150
Tax	15	135
Dividends	25	105

Balance Sheets at 31 December 2014

	DG Insurer	**Company A**
	R millions	R millions
Assets	1595	9735
Liabilities		
Outstanding claims	325	4500
UPR c/f	400	3375
DAC c/f	-10	-270
Current Liabilities	3	75

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Shareholder Funds		
Share capital	100	150
Share premium account	200	900
Profit & Loss account	577	1005

ii. Calculate the following Profit and Loss items for both companies:

a. Underwriting profit
b. Insurance profit
c. Profit after tax
d. Retained profit

[4]

iii. Calculate the following ratios for both companies:

a. Claim ratio
b. Profit margin
c. Return on shareholder funds held at 31 December 2013
d. Solvency ratio at 31 December 2014

[4]

iv. Outline the limitations of the information provided (and calculated) for the purpose of deciding whether to acquire the company.

[5]
[Total 17]

QUESTION 6

You are an actuarial manager in a large consultancy firm. You are carrying out an independent annual review of the IBNR reserves for one of your clients, a large South African short-term insurance company. This is the second time that your firm is performing such a review for the insurer. Your analyst, who reports directly to you, has recalculated the IBNR reserves for the motor class of business. Your analyst's IBNR reserves differ materially from the insurer's own estimates (calculated by its own actuaries). Your analyst has confirmed that he has had minimal contact with the insurer and that he has used the same methodology and assumptions as last year to calculate the IBNR reserves. Last year the insurer used the BF method based on incurred data (for the last two accident years) and the chain ladder method on incurred data (for prior accident years).

In a recent discussion with the insurance company's chief actuary you noted the following:

- As part of a reserve clean-up exercise performed during the latest year the insurer has set all case estimates that were outstanding for more than 7 years from the date of incidence to zero.
- There was a significant increase in the volume of motor insurance sold to taxi drivers in the latest year. The insurer has confirmed that reporting delays for taxi drivers are expected to be longer than for individuals. The insurer has calculated the IBNR reserves for taxi business together with other motor insurance.

PLEASE TURN OVER

- The recent deterioration in the rand over the last year has increased the cost of imported parts. Allowance has been made in the selected prior loss ratio for the most recent year.
- The last year saw a sharp increase in motor premium rates primarily in reaction to significant hail damage suffered in the previous year.
- Earlier this year the insurer moved to a new claims administration system which has decreased the delay to settlement of claims across all accident cohorts. No adjustment has been made for this.

i. Outline possible reasons, other than those which emerged in your recent discussion with the insurer, which could have explained the differences between your analyst's IBNR estimates and the insurer's estimates.

[5]

ii. Describe the impact that each of the points noted in your discussion with the insurer could have on the IBNR, and identify any problems this may cause in your estimation of the IBNR.

[7]

iii. Outline briefly reasons why the claims reserves (for reported and unreported claims) between different classes of business may be correlated.

[3]

[Total 15]

QUESTION 7

A large carpentry (wood-working) business has approached your insurance company for an insurance quote. The company has 10 stores around South Africa where they sell furniture and other wooden items, with one large workshop in Gauteng where they create the products using modern wood-working tools. Wood is purchased from an independent plantation and is transported to the workshop using the carpentry company's own fleet of trucks. Once the furniture has been made it is transported to the various stores around the country. The company employs 20 staff to run the stores where sales are made and 15 carpenters to make furniture from the wood at the workshop. The management and administration staff, as well as their 3 drivers, are also based at the workshop.

i. List eight key risks that this carpentry company is exposed to. For each risk, suggest a type of insurance that will be suitable to cover the risk.

[6]

ii. Define the term "adjustment premium" and discuss the suitability of an adjustment premium in this scenario.

[3]

iii. The company has requested a discount on its premium due to its operations being spread around the country.

Outline the points you would make in response to this request.

[5]

iv. Suggest, with reasons, four ways the company could reduce their insurance premium.

[4]

[Total 18]

END OF PAPER