EXAMINATION

6 June 2012 (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. *Candidates should 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

You are the actuary to a general insurance company which writes commercial motor insurance.

i. Explain how credibility techniques can be used to set premium rates for commercial motor insurance policies.

[5]

ii. Outline the issues that you would consider when using credibility models for pricing this business, with specific reference to the complement of credibility.

[9]

[Total 14]

QUESTION 2

Trident is a large general insurance company, which specialises in writing motor insurance for bus fleets.

i. Explain the reasons why this insurer may decide to seek catastrophe excess of loss reinsurance.

[4]

Insurance-linked securities are becoming a popular alternative/compliment to catastrophe reinsurance. Trident is considering issuing a catastrophe bond (a type of insurance-linked security) which will operate as follows:

Trident will issue a bond to investors in the financial markets. Trident will receive a lump sum up front and will promise to pay back (to the investors) coupons at regular intervals and a final redemption payment at some future date.

However, the repayment of coupons and the final repayment are contingent on a catastrophe event not occurring. If a catastrophe event does occur, then the investors will forfeit future repayments. The money which would have been paid to the investors can then be used by Trident to fund the insurance claims arising from the catastrophe event.

ii. Outline briefly the relative advantages and disadvantages to Trident of using a catastrophe bond (as described above) as opposed to using catastrophe excess of loss reinsurance.

[6]

[Total 10]

PLEASE TURN OVER

QUESTION 3

Avisure is an insurance company, which has sold aviation insurance for the past 15 years. Your consulting company, Modact (Pty) Ltd, has been contracted to design and implement an internal model of Avisure's business.

i. State what actuaries are aiming to achieve when they build an internal model for an insurance company.

[1]

ii. List six different ways in which Avisure might make use of an internal model of its business, other than to determine its risk-based capital.

[3]

iii. Explain how the model might be used to determine the company's risk-based capital, including an explanation of the essential requirements of the model to be used for this purpose.

[13]

iv. Describe the advice you would give to the individuals operating the model and using its output to make decisions (some of whom have little past expertise in this regard).

[6]

[Total 23]

QUESTION 4

The multinational general insurance company for which you work, which specialises in employers' liability insurance, is in the process of designing a new computer system for the administration of its book of business.

i. Describe briefly the claims data items that you would expect the new system to include.

[3]

ii. For each of the common data errors listed below, suggest automated checks/processes that could be built into the new system that might help to minimize the incidence of such errors:

a. Information entered onto the wrong claim record
b. Incorrect claim dates entered
c. Incorrect payment dates entered
d. Incorrect amounts (or the wrong currency) entered
e. Incorrect case estimates entered for a claim
f. Information omitted

[6]

[Total 9]

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QUESTION 5

The general insurance company for which you work writes household and liability insurance. The company publishes a separate allowance for total IBNR reserves in its year-end accounts.

i. Explain why a general insurance company may wish to calculate IBNR reserves as a separate element.

[1]

ii. Discuss the relative advantages and disadvantages to the company of each of the following methods for deriving the allowance for IBNR:

a. A fixed percentage of the written premium for the accounting year.
b. A fixed percentage of the total reserves for known and reported outstanding claims at the end of the accounting year.
c. A fixed percentage of the cost of claims reported during the accounting year.
d. The product of earned premiums for the accident year and expected loss ratio less the cost of reported incurred claims for the accident year.

[9]
[Total 10]

QUESTION 6

You work for a general insurance company that specializes in employers' liability insurance. A large local industrial company with 2500 employees has approached you for quotations for the renewal of its employers' liability cover.

i. List 8 rating factors which may be used for employers' liability insurance.

[2]

ii. Define what is meant by a "prospective experience-rating system", and outline how the insurer's underwriting risk is higher with such a system than with a retrospective system.

[2]

iii. Describe how the company could determine the renewal premium for the industrial company using a prospective experience-rating approach.

[12]
[Total 16]

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QUESTION 7

You are an analyst covering the general insurance sector for a firm of stockbrokers. Summarised versions of the most recent published balance sheets of two general insurance companies are included below. Company ABC's published accounts are prepared on an accident year basis, while Company XYZ's accounts are prepared on an underwriting year basis. Premium income levels have remained stable for both insurers for several years.

ABC: Balance Sheet as at 31.12.2010

Assets	**(R mill)**	**Liabilities**	**(R mill)**
DAC	40	UPR	200
Cash	150	Claim reserves	300
Investments	550	Share capital	25
		Share premium account	75
	___	Retained profits	140
Total assets	740	Total liabilities	740

XYZ: Balance Sheet as at 31.12.2010

Assets	**(R mill)**	**Liabilities**	**(R mill)**
Investments	700	Claim reserves	600
		Share capital	25
	___	Retained profits	75
Total assets	700	Total liabilities	700

ABC has announced a takeover of XYZ in which all its shares will be purchased for R125m as at 31.12.2010. After further investigation and discussion with the management of XYZ you obtain the following information about Company XYZ:

- Net premium written evenly over 2010 of R160m with average commission of 25%;
- Expected loss ratio for 2010 underwriting year is 85%.

After discussion with the management of Company ABC you obtain the following additional information:

- ABC's expected loss ratio for business written in 2010 is 65%;
- ABC's management expects to increase XYZ's claim reserves by 5% to be consistent with ABC's level of prudence in claim reserves.

You have been informed that the investments held by both ABC and XYZ comprise entirely of short-dated fixed interest assets (of less than three months' duration).

i. Prepare the balance sheet as at 31.12.2010 for XYZ on an accident year basis.

[3]

PLEASE TURN OVER

ii. Prepare the balance sheet for Company ABC as at 31.12.2010 showing the effect of the takeover.

Assume any goodwill arising will not be written off immediately.

[4]

iii. By calculating appropriate accounting ratios comment on:

a. the types of business written by ABC & XYZ; and
b. the impact of the takeover on ABC's solvency position.

[5]

iv. Discuss the appropriateness of the investments for ABC and XYZ's respective businesses prior to the takeover, and outline briefly what changes you would recommend to ABC's investment portfolio after the takeover.

[6]
[Total 18]

END OF PAPER

