EXAMINATION

29 April 2010 (pm)

Subject ST8 — General Insurance: Pricing Specialist Technical

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*

2. *You have 15 minutes before 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 10 questions, beginning your answer to each question on a separate sheet.*

6. *Candidates should show calculations where this is appropriate.*

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet, with any additional sheets firmly attached, 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.

1 (i) List possible parameters within the event set of a hurricane catastrophe model. [1]

(ii) List other natural perils for which a catastrophe model is commonly used. [1]
[Total 2]

2 (i) Define "risk factor" and "rating factor". [2]

(ii) Explain, using examples, the difference between them. [3]
[Total 5]

3 A general insurance company plans to create a system for monitoring lapse experience at renewal for a book of business.

(i) Describe, giving examples, the key features of a good system for this purpose. [7]

(ii) List the data that is likely to be required for the system. [2]

The company plans to introduce a range of operational initiatives designed to reduce the proportion of customers who do not renew their policies after receiving a renewal invitation. It wishes to monitor the effect of the initiatives as quickly as possible to help decide whether to continue them.

(iii) Explain the difficulties that the company is likely to have with measuring the change in lapse experience and how these might be overcome. [5]
[Total 14]

4 (i) State what is meant by a soft insurance market. [1]

(ii) Discuss the reasons why general insurance companies may wish to continue writing business during a soft market. [4]

(iii) Describe and evaluate strategies that a London-market insurance company might adopt during a soft market. [7]
[Total 12]

5 The following table shows pure loss cost Increased Limit Factors for a class of business.

Limit	*ILF*
100,000	1.00
200,000	1.47
500,000	2.05
1,000,000	2.68
1,500,000	3.03
2,000,000	3.18

(i) Calculate the ILFs for the following two layers:

(a) 1 million xs 0.5 million
(b) 1 million xs 1 million

[1]

An underwriter has asked an actuary to analyse two different possible sets of contract terms for a proposed liability insurance contract:

Option A – 1 million xs 0.5 million for a premium of 20,000
Option B – 1 million xs 1 million for a premium of 10,000

(ii) Determine which option appears to be more profitable, using the ILF table provided. [2]

(iii) Suggest further comments that the actuary might make to assist the underwriter. [3]

The actuary wishes to use the ILFs in the table to price a three-year contract starting on 1 January 2011 but discovers that the ILF curve was specifically built for calendar year 2009. Claims inflation has been 5% per annum on average in recent years.

(iv) Stating any assumptions you make:

(a) Calculate revised ILFs for limits of 100,000 and 200,000; and

(b) Calculate the ILF of layer 100,000 xs 100,000 for this contract.

[6]
[Total 12]

6 In July 2010, an underwriter of a London-market general insurance company approaches the company actuary about pricing an insurance policy that is due for renewal in 2010. He asks the actuary to give him an early opinion on an appropriate price for the purposes of preparing the renewal. He expects to get more-detailed information closer to renewal. The policy concerns marine hull insurance.
The following information is available.

- The insurance company has underwritten the policy since 1 October 2007.
- Over that period deductibles have not changed.
- Policies have always been annual and renewed on 1 October.
- The "policy year" runs from 1 October in the year indicated to the following 30 September.

The claims department provides the following claims data for the policy.

Policy Year	*Incurred Claims ($)*	*Comments*
2007	3,317,000	
2008	8,600,000	Includes 1 large loss of $5 million
2009	15,000	

From the insured company's website the actuary finds the gross tonnage (GT) of the insured's fleet at particular historical points, as follows.

Date	*GT (millions)*
01/01/2008	1,909
01/01/2009	1,970
01/01/2010	2,017
01/01/2011 (estimated)	2,050

The actuary decides to use GT as the exposure measure.

(i) Estimate the GT for each of the four policy years commencing 1 Oct 2007 to 1 Oct 2010 inclusive, stating any assumptions that you make. [4]

The actuary estimates that total "non-large" losses in each policy year are currently developed to the following proportions of their ultimate levels:

Policy Year	*Proportion*
2007	95%
2008	60%
2009	45%

The actuary also decides that any individual loss of over $500,000 should be capped at $500,000 and treated as "non-large" prior to estimating ultimate claims.

(ii) Estimate the ultimate "non-large" claims for policy years 2007 to 2009. [2]

(iii) State an alternative approach to calculating the ultimate claims for policy years 2008 and 2009. [1]

(iv) Estimate the "non-large" losses for the 2010 policy year, ignoring claims inflation and stating any assumptions that you make. [3]

(v) Estimate a large-loss loading for the 2010 policy year, ignoring claims inflation. [2]

Because of trends observed in the market as a whole the actuary decides that he should incorporate some claims inflation since 2007 into his calculations.

(vi) Describe how this would alter the analysis in (iv) and (v), particularly regarding the treatment of the deductible. [3]

[Total 15]

7 Company B, a general-insurance broker, has for several years arranged general insurance. All policies have been underwritten by a single general insurance company, S. B is planning to set up a new arrangement under which it will broke policies to a panel of general insurance companies instead of solely to S. Each policy will be underwritten by the panel member offering the lowest quote net of commission. Panel members may decline to quote for each risk, but each policy will be reoffered to all panel members on renewal.

A general insurance company, U, has been invited to join the panel.

(i) List the data that U should request from B for the purpose of creating a pricing structure. [4]

(ii) Discuss the most likely sources of error or distortion in the data requested by U. [5]

U is disappointed with the quality of the data supplied by B, particularly for sole traders and for liability covers.

(iii) Explain the likely effect of the inadequate data on U if it creates a pricing structure based on it. [3]

(iv) Suggest measures that U could take to mitigate the effects of using the poor-quality data. [4]

[Total 16]

8 The Claims Director of a general insurance company has received a report on claims frequencies for its household-contents business. The report shows that policyholders with a professionally-maintained burglar alarm linked to the police have a higher overall frequency of theft claims than policyholders with a lower standard of security. The Claims Director is aware that the Company offers lower prices for policyholders with higher standards of security so would like to understand the reason for the apparent contradiction. The company uses a generalised linear model to assess claims cost for the policies.

(i) Discuss the matters that should be investigated and points that should be raised in a reply to the Claims Director. [6]

(ii) Outline analyses of rating factors in the claims model that could help to illustrate the reply. [3]

[Total 9]

9 Nine months ago a general insurance company underwrote a new motor fleet policy covering 1,000 vehicles. Based on its normal premium-rating assumptions the insurance company expected a claim frequency of 16% per year. To date, 109 claims have been received, and the promptness with which claims have been reported suggests that there are no claims that have been incurred but which have not been reported.

The contract is now being considered for renewal and the underwriter has asked whether or not it is appropriate to rate the new contract on the basis of its claims experience to date.

(a) Explain whether or not you think that this is likely to be appropriate; and

(b) Suggest a claims frequency that might be used in the re-rating.

Base your answers on credibility theory and state any assumptions that you make. [7]

10 A small well-capitalised London-market insurance company underwrites a variety of direct commercial and industrial property and liability insurance. Outline, with reasons, the types of reinsurance it is likely to buy. [8]

END OF PAPER