EXAMINATIONS

26 April 2004 (am)

Subject 303 — General Insurance

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 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 8 questions, beginning your answer to each question on a separate sheet.*

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 Actuarial Tables and your own electronic calculator.

1 State the reasons why a general insurance company might calculate IBNR reserves separately from other claims reserves. [2]

2 A general insurance company that writes commercial property insurance business wants to purchase excess of loss reinsurance protection in order to reduce the overall variability of its claims experience. You have been asked to recommend an appropriate reinsurance structure (limit, deductible, number of reinstatements etc). You decide to build a model of the likely claims experience and reinsurance recoveries.

(i) State the functionality that you would require of this model. [3]

(ii) State the other factors that the insurance company needs to consider before deciding to purchase the reinsurance. [5]
[Total 8]

3 You are the actuary for a general insurance company that writes motor fleet business. One of the options available to the insured is for it to take a voluntary aggregate deductible on its policy.

(i) (a) Define what is meant by a deductible.
(b) Define what is meant by an aggregate deductible.
[2]

A particular insured currently pays £100,000 a year for insurance cover with no deductibles of any kind, and would like to consider the impact on its premium of adopting a £10,000 annual aggregate deductible. It has been suggested that each £1 of aggregate deductible should reduce the premium by £1.

(ii) Discuss, with reasons, whether the suggestion is correct, or whether the true reduction would be higher or lower than this (assuming that any loadings to the risk premium remain unchanged in monetary terms). [6]
[Total 8]

4 (a) State the ways in which a general insurance company can increase its gross written premium.

(b) State the constraints that it faces in doing so. [10]

5 (i) State what is meant by a soft market and explain how it occurs and persists. [4]

(ii) Describe the risks to a general insurance company of under-estimating the softness of a market. [6]
[Total 10]

6 A reinsurance company wants to introduce a new type of aggregate excess of loss treaty covering subsidence claims on household insurance business. The treaty will cover all subsidence claims notified, during a calendar year, to an insurer. The treaty will be subject to an aggregate deductible and an aggregate limit.

(i) State the characteristics of subsidence claims likely to be experienced by the insurer. [5]

(ii) State the advantages and disadvantages to the reinsurer of the proposal. [6]

(iii) (a) List the information that the reinsurance company would request from the insurer if it were trying to price this treaty.

(b) List the information likely to be required from other than the insurer in order to price this treaty.

[8]
[Total 19]

7 You have been provided with the following financial information in respect of a general insurance company.

	1999	*2000*	*2001*	*2002*	*2003*	*Total*
Gross Earned Premium	66	71	187	165	220	709
Reinsurance Earned Premium	12	19	103	72	76	282
Net Earned Premium	54	52	84	93	144	427
Gross Claims Incurred	29	51	210	249	148	687
Reinsurance Claims Recoverable	1	31	155	138	14	339
Net Claims Incurred	28	20	55	111	134	348
Net (of reinsurance) Commission	10	11	32	29	35	117
Net Assets	53	32	91	112	121	409
Management Expenses	5	4	12	14	11	46

(i) (a) Define the terms gross loss ratio, net loss ratio, expense ratio, combined ratio and solvency ratio.

(b) Calculate these ratios for each of the five years of data. [7]

(ii) Describe the changes in the company finances from year to year in the following areas calculating any additional statistics which support your analysis.

(a) The efficiency of the management at controlling expenses.
(b) Growth.
(c) Reinsurance purchasing.
(d) Underwriting profitability. [10]

(iii) Suggest where the management focus should be in the coming year. [2]
[Total 19]

8 You are advising a consortium of insurance professionals who wish to set up a new reinsurance company. The business plan is to write international liability reinsurance on a non-proportional basis. It is intended to reinsure professional indemnity covers and employers liability covers. The company will be able to accept business from any territory.

You have been asked to assist in deriving appropriate rating structures for the company to meet its targets. The financial backers require a return on capital of 40% per annum on average. The company wants to write £100m of premium income for each of the two types of cover.

You have already calculated risk premiums for the two different lines of business.

(i) List the adjustments that should be made to the risk premium to generate the office premium. [2]

(ii) Describe the ideal requirements of an actuarial model. [4]

The company wishes to use a stochastic actuarial model to allocate capital between the two lines of business such that the probability of ruin is the same for each line of business.

(iii) Describe the steps involved in using a stochastic model to derive this common probability of ruin. [5]

(iv) State the advantages and disadvantages of a stochastic model over a deterministic model in this situation. [4]

Using a stochastic model, you determine that professional indemnity reinsurance is a more volatile class of business, and requires 50% more capital to support every £1 of premium underwritten than employers’ liability reinsurance. The business plan shows that the profit available (after allowing for investment returns) on employers liability reinsurance is 12% of the premiums written, and it is intended that all lines of business produce the same return on capital.

(v) Calculate the total capital required for the business based on the business plan if the financial backers’ target is to be achieved. [4]

(vi) Describe the other factors that the consortium should consider before deciding upon a suitable amount of capital for this new company. [5]

[Total 24]

END OF PAPER