

EXAMINATION

9 September 2005 (pm)

Subject ST3 — General Insurance 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 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.*
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.

- 1** (i) Explain the difference between accident year accounts and funded accounts. [2]
- (ii) Give four examples when funded accounts could be appropriate. [2]
[Total 4]
- 2** (i) Define the terms:
- (a) suretyship
- (b) moral hazard [2]
- (ii) Explain how a general insurance company writing suretyship business can minimise the risk of moral hazard in respect of the cover it provides. [4]
[Total 6]
- 3** You are a consulting actuary who has been approached by a general insurance company, which writes more than one line of insurance business.
- (i) You have been asked to comment on the recent relative profitability of the different lines of business for this company. State, with reasons, the types of investigations that you will need to carry out in order to do so. [3]
- (ii) On completion of the above task, you are asked to comment on the company's reinsurance structure. List the types of investigations that you would carry out. [4]
[Total 7]
- 4** A reinsurance company writes a book of catastrophe reinsurance contracts to an expected combined ratio of 60%. It estimates that its aggregate claims distribution is compound Poisson with $\lambda = 20\%$ and the claim size distribution is exponential with mean of \$1m.
- (i) Calculate the minimum amount of capital it needs to ensure that its ultimate probability of ruin stays below 0.5%. [5]
- (ii) Ignoring investment income, calculate the return on capital that the reinsurer would generate if it held the amount of capital that you calculated in (i) above. [1]
- (iii) Suggest potential practical limitations of the above solution. [1]
[Total 7]

- 5** You are an actuary working for a general insurance company that writes a wide variety of classes of insurance. You have been asked to attend a cross-functional group looking at how to improve the company's defence against fraudulent claims. As part of your preparation you have been asked to suggest ways in which fraudulent policyholder behaviour may be reduced.

Outline the suggestions you would make. [14]

- 6** The government of a small developing country wants to encourage the development of the agricultural sector in its country. One of the measures it has taken is to establish a specialist insurance company to provide crop insurance to farmers in its country.

The insurance company would charge an annual premium and provide compensation to farmers for crop failure resulting from drought, disease or pests during the policy year. The compensation provided will equal the sum insured less the proceeds from the sale of the crop.

- (i) List the rating factors that the insurance company might use to set premiums. [3]
- (ii) Describe the characteristics of claims that the insurer can expect to receive. [5]
- (iii) State the factors that will influence the level of capital that the insurer will need. [5]

[Total 13]

- 7** You are an actuary working for a general insurance company that has been in business for three years, writing only motor insurance third party liability, in a country that does not allow claims equalisation or catastrophe reserves.

- (i) State the required technical reserves likely to appear in the management accounts and the matters you would consider in determining the reserving methods to calculate these reserves. [18]
- (ii) Discuss how you would overcome any particular issues or difficulties faced in applying the methods discussed in (i). [6]

[Total 24]

8 You are a general insurance actuary working for an insurance company which writes only household business.

- (i) Describe, with examples, the adjustments that may be made to the base experience to obtain the burning cost premium. [10]
- (ii) Explain the adjustments that may be made to the burning cost premium to calculate the premium the customer is charged when initially taking out a policy. [10]
- (iii) Describe any further adjustments that may be made to the premium in (ii) to derive a renewal premium. [5]

[Total 25]

END OF PAPER