

# EXAMINATION

6 April 2006 (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 6 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** You are the actuary for a small general insurance company with a low solvency margin. The insurer only writes commercial property and household risks which are located in a small country.
- (i) Explain the differing claims characteristics of these two classes of insurance. [3]
  - (ii) Suggest, with reasons, the types of reinsurance that this company might purchase. [7]
- [Total 10]
- 2** You are the actuary for a general insurance company writing household buildings and contents insurance.
- (i) List the information you would seek to determine estimates of exposure for future flood damage. [3]
  - (ii) Describe how the total exposure to a major flood loss could be assessed using the information in (i). [7]
  - (iii) Discuss the degree of difficulty that you would expect to arise in obtaining the information. [3]
- [Total 13]
- 3** An insurance company specialises in writing commercial property insurance business. As part of the company's business planning, it prepares financial projections using a number of stress tests. One such stress test makes the following assumptions:
- (a) A geographic region where the company writes 25% of its business is subjected to a strong earthquake and
  - (b) A rise in interest rates causes a 20% fall in the bond market.
- Describe the particular risks that the company would face under such a scenario. [15]

- 4 You are an actuary working for a reinsurance company. You have been asked to help price a new quota share reinsurance contract protecting a short tail class of business. You have been given the following historical data from 2001 to 2005 underwriting years on the business that is subject to the quota share.

| <i>Year</i> | <i>Written Premium<br/>£m</i> | <i>Incurred Losses<br/>£m</i> | <i>Rate Change</i> |
|-------------|-------------------------------|-------------------------------|--------------------|
| 2001        | 120                           | 144                           | N/A                |
| 2002        | 130                           | 143                           | 50%                |
| 2003        | 150                           | 120                           | 10%                |
| 2004        | 150                           | 120                           | 5%                 |
| 2005        | 140                           | 126                           | 0%                 |

Rate change figures indicate the percentage increase / decrease in premiums collected from an identical risk from one year to another.

You also know that claims inflation has been running at 4% per annum over this period for this class of business and that premium rates in 2006 are expected to fall by 5%.

- (i) Calculate the loss ratio that can be expected for 2006 for this class based on all of the historical experience and the rate change and inflation assumptions given above, stating any assumptions you make. [9]
- (ii) State other information that you would require in order to determine if this quota share contract is expected to be profitable for 2006. [5]
- (iii) The ceding company has told you that it expects its loss ratio in 2006 to be 85%. Suggest reasons why the ceding company's expected loss ratio for this contract might be different from the value calculated in part (i). [5]

[Total 19]

- 5** (i) Explain how you would obtain an indication of the strength of a general insurance company's claim reserves based on published information. [5]

Company ABC is a general insurance company. The following information is available:

|                             | 2001  | 2002   | 2003   | 2004   | 2005  |
|-----------------------------|-------|--------|--------|--------|-------|
| Gross written premium (GWP) | 2,000 | 2,500  | 3,000  | 3,250  | 2,000 |
| Outstanding claims b/fwd    |       | 100    | 465    | 927    | 1447  |
| Policy count at mid-year    |       | 30,000 | 32,000 | 35,000 |       |

All monetary amounts are \$000s.

Unearned premium reserve brought forward into each year is 10% of the GWP in the previous year. Claims paid in each year are 60% of the GWP in that year. Over the period 2002 to 2005 commission has been paid to intermediaries at 8% of the gross written premium. Expenses of writing and handling claims on the business are \$5 per policy and 2% of claims paid in the year respectively. Reinsurance costs are 5% of gross written premium. Investment return is earned at a rate of 5%. Cost of capital and free reserves are to be ignored in calculating investment return.

- (ii) Using the above information, and stating any assumptions you make, calculate the pre tax profit ABC made in 2002, 2003 and 2004. [9]
- (iii) Comment on the results in (ii). [4]
- [Total 18]

- 6** You are the pricing actuary for a general insurance company that underwrites event insurance. You have been approached by a charity that is organising a fun run for up to 2,000 people and wishes to arrange suitable insurance cover. To maximise possible attendance the organisers will be accepting entries on the day. Your company is not authorised to write motor insurance.

- (i) Describe the types of insurance cover, excluding motor insurance, that the event organising company may wish to purchase. [8]
- (ii) List, with reasons, the information you might require from the event organiser in order to establish the risk premium for this event. [10]
- (iii) List, with reasons, the policy exclusions you would expect to see under each of the products described in part (i). [7]
- [Total 25]

**END OF PAPER**