# EXAMINATIONS

April 1998

## Subject G — General Insurance

*Paper One*

*Time allowed: Three hours*

***INSTRUCTIONS TO THE CANDIDATE***

1. *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.*

2. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*

3. *Write your surname in full, the initials of your other names and your Candidate's Number on the front of the answer booklet.*

4. *Mark allocations are shown in brackets.*

5. *Attempt all 21 questions, beginning your answer to each question on a separate sheet.*

*AT THE END OF THE EXAMINATION*

*Hand in BOTH your answer booklet and this question paper.*

| *In addition to this paper you should have available Actuarial Tables and an electronic calculator.* |
|---|

**1** Explain what problems are encountered when trying to use past claims experience to revise premium rates for Mortgage Indemnity Guarantee insurance. [4]

**2** Define Product Costing, Product Rating and Product Pricing and describe how they are related to each other. [2]

**3** List six features which a risk must exhibit in order for it to be considered insurable. [3]

**4** State four distinct terms that may be used in a report prepared by an actuary in accordance with GN12 and explain briefly how each term may have different interpretations. [4]

**5** Describe what is meant by a First Loss, and give an example of circumstances when it is appropriate. [2]

**6** Explain briefly the problems that a new general insurer may encounter if using industry-wide data for product pricing. [3]

**7** Define the following terms used in general insurance:

(i) Deferred Acquisition Costs
(ii) Insurance Result
(iii) Premium Income Limit [3]

**8** List four reasons for the use of funded accounts in the Lloyd's Market. [2]

**9** State four main ways that the Companies Act (Accounts) Regulations make allowances for the uncertainty involved in general insurance business. [2]

**10** A director of a general insurance company has suggested that in order to maximise the returns to shareholders the free reserves should be invested in high growth equities. Compare and contrast briefly the applicability of this suggestion in relation to:

(a) A small proprietary company writing UK medical insurance with free reserves of 25% of gross premium.

(b) A large proprietary company writing a mix of business with free reserves of 60% of gross premium. [6]

**11** A general insurance company's rating structure for its household policies is such that expenses are loaded for by the addition of a fixed sum £X to the risk premium. It is proposed to introduce a 4 year NCD system, by level rebates to a maximum of 30% of office premium (i.e. 10%, 20% & 30%) and with a two year fall back on making each claim. Assuming that office premiums gross of NCD are not adjusted to reflect this proposal there will be a reduction in expense contribution from this class. Claims follow a Poisson distribution with mean and variance 0.1.

Calculate the expense shortfall in each year of the first 4 years of the new NCD system, assuming a stationary portfolio of business. You should ignore the effects of inflation. [6]

**12** A United Kingdom proprietary general insurance company writes several classes of business:

(i) State how inflation affects the value of the claims reserves. [2]

(ii) Discuss the consequences of underestimating the effect of inflation when setting the claims reserves. [4]

[Total 6]

**13** You are the actuary to a United Kingdom proprietary general insurance company which writes only private motor insurance. The underwriter states that he is concerned that there may be cross subsidies within the company's rating structure, in particular those relating to policyholder age, gender, vehicle group and vehicle age.

Describe briefly the areas of the investigations you would carry out in order to quantify the effect of any cross subsidies. [6]

**14** Describe briefly the events which give rise to the insurance cycle. [2]

**15** A United Kingdom general insurance company writes employers liability business only. The figures in the table below are derived from the DTI returns for the first three years of trading. (Net in the table means net of reinsurance.)

(thousands of ECU's)

| | *1995* | *1996* | *1997* |
|---|---|---|---|
| Gross Written Premium | 25,000 | 40,000 | 55,000 |
| Net Written Premium | 18,000 | 21,000 | 27,000 |
| Gross Earned Premium | 12,500 | 32,500 | 47,500 |
| Net Earned Premium | 9,000 | 19,500 | 24,000 |
| Gross Claims Paid | 3,500 | 13,000 | 25,500 |
| Net Claims Paid | 2,500 | 6,750 | 12,000 |
| Gross Claims Outstanding | 5,250 | 15,000 | 22,750 |
| Net Claims Outstanding | 3,750 | 7,500 | 12,250 |

Calculate the required margin of solvency at the end of 1996 and 1997. [6]

**16** Explain what is meant by Finite Risk Reinsurance. [2]

**17** Describe how to apply a burning cost method and state the circumstances in which such a method would be used. [6]

**18** Define equalisation reserves and state four reasons for holding such reserves. [3]

**19** A reinsurer is considering the renewal of a stop loss treaty. List the data required and outline the steps in the calculation of a rate to be charged. [5]

**20** Outline the main advantages and disadvantages of the Bornhuetter - Ferguson method of calculating outstanding claims reserves. [4]

**21** You have been provided with the following financial information for proprietary insurance companies A , B and C for the accounting year 1997. Amounts are given in £million.

| | *Company* | | |
|---|---|---|---|
| | *A* | *B* | *C* |
| Gross Written Premium | 60 | 1000 | 200 |
| Additional Provision for Unexpired Risks c/fwd | 20 | 0 | 0 |
| Gross Outstanding Claims b/fwd | 10 | 500 | 680 |
| Gross Claims paid | 40 | 600 | 100 |
| Gross Outstanding Claims c/fwd | 30 | 400 | 700 |
| Non Acquisition Expenses | 5 | 125 | 30 |
| Investment Income | 5 | 150 | 30 |
| Current Assets (at year end) | 5 | 50 | 25 |
| Current Liabilities (at year end) | 12 | 60 | 30 |
| Total Investments (at year end) | 100 | 1700 | 950 |
| Share Capital (at year end) | 10 | 200 | 90 |
| Acquisition Costs as a percentage of Gross Written Premium | 10 | 10 | 15 |

(i) Construct the balance sheet for each of the three companies as at 31 December 1997, stating any assumptions that you make. [5]

(ii) Based on the data provided calculate the following statistics for each of the companies, stating any additional assumptions not made in part (i).

(a) Solvency Ratio
(b) Claim Ratio
(c) Return On Capital Employed [5]

(iii) Compare the results derived in part (ii) for the three companies, and discuss briefly possible reasons for their differences. [5]

(iv) Define other insurance related ratios (i.e. in addition to those in part (ii)) which may be used when comparing the companies' published accounts and state their objectives. [8]

[Total 23]