

EXAMINATIONS

18 September 2000 (am)

Subject 303 — General Insurance

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 9 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** (i) State the advantages and disadvantages of discounting technical reserves. [4]
- (ii) Company A and Company B have always had exactly the same portfolio of business, each taking 50% of any risk on a coinsurance basis. In their published accounts, company A sets reserves that are intended exactly to pay for outstanding claims, discounted at the rate of interest the company expects to earn on its assets. Company B's reserves always include a 20% margin for prudence above the amount it believes necessary to pay these claims, and it does not discount its reserves.
- Discuss the differences between the accounts of Company A and Company B, as they would appear to an analyst who was not aware of this information. [10]
- [Total 14]
- 2** (i) Define experience rating. [1]
- (ii) Describe how prospective and retrospective rating methods work. [4]
- (iii) Explain how number-based and cost-based experience rating systems are used. [6]
- [Total 11]
- 3** (i) List the main uses of policy and claims data in a general insurance company. [3]
- (ii) List the main aspects of an insurer's experience that should be analysed if the insurer is to maintain adequate control of its business. [2]
- [Total 5]
- 4** A general insurance company that writes only motor business exclusively through brokers has experienced a gradual but increasing reduction in its market share over the past five years. The company has decided to use the internet with a view to preventing further reduction and achieving 50% of its sales through this medium within the next five years. Discuss the possible effect this strategy may have in the following areas of the company's business:
- The Cost Structure
 - Broker Arrangements
 - Calculation of Premiums
 - Business Mix and Volumes
 - Reinsurance Arrangements [10]

- 5** You are the actuary to a general insurance company writing product liability insurance. The Chairman of the company has noticed that the Government has recently issued a new index linked government loan. This pays a nominal coupon of 1.5% per year, and both the coupon and the capital value of the loan are indexed to the local consumer price index. It matures in 2016. The Chairman has suggested that this loan would be an appropriate investment for the company. Explain, with reasons, whether or not the stock should be purchased. [5]

- 6** A large reinsurance company has recently received a request from a small insurance company for technical assistance. The insurer, which has total reserves of \$60 million and currently writes \$25 million of annual premiums, all of which is private household insurance, has decided to expand into commercial property insurance with a view to writing roughly the same volume of business in that class in terms of premium income, thus doubling its total premium income. The reinsurance company has been asked to provide assistance in setting the premium rates to be charged, and to provide suitable reinsurance cover for this new class and for the company as a whole. As actuary to the reinsurance company you have available risk premiums for different types of commercial property that you can provide to the insurance company.

- (i) Explain how the insurance company should formulate the total premium to be charged for each risk. [5]
- (ii) Describe:
 - (a) the reinsurance arrangements you would recommend, including any limits or restrictions to the cover, and
 - (b) the information the reinsurance company would require from the insurance company with regard to the risks it underwrites. [5]
- (iii) Describe how the reinsurance company should price each part of the reinsurance policy. [6]

[Total 16]

- 7** You are the actuary of a major insurer that for the last ten years has been writing twelve year warranty business covering major damage caused by building defects in new homes. The table below shows the policies issued and resulting claims outgo for a particular builder whose premium rates are under review at his own request.

<i>U/W Year</i>	<i>No of policies</i>	<i>Claims paid in year after writing (thousands)</i>									
		<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>
1	20,000	7	15	20	30	40	95	160	195	220	230
2	18,000	9	15	20	25	55	125	145	175	170	
3	12,000	10	20	20	40	85	135	150	155		
4	11,000	9	15	30	30	80	120	115			
5	10,000	8	25	40	50	70	90				
6	8,000	10	30	35	45	55					
7	13,000	10	20	25	25						
8	15,000	9	15	15							
9	25,000	6	10								
10	26,000	4									

- (i) Describe the main claims features of this business that can be deduced from the above table. [3]
- (ii) You are aware that a competitor insurance company has quoted for this business. You know that the rate the competitor quoted is lower than the rate you are currently charging, but you are not sure precisely what that rate is. Explain with reasons how you would calculate the new office premium to be quoted, given that the necessary loadings for expenses, commission and reinsurance are already known. [9]
- [Total 12]

- 8** A general insurance company wishes to review its premium rates. It has maintained a full database of the policy and claims data required to analyse the experience for a particular risk group.

Discuss why it may be necessary to make adjustments to the base data before it can be used in a rating exercise. [15]

9 You are the actuary to a small general insurance company that writes personal accident business.

One type of policy has a term of five years. Policyholders may buy it in units, each of which costs €20, payable at the start of the term. Each unit pays a monthly income of €100, payable at each monthly anniversary of the policy from the policyholder's accidental death until and including the end of the term. In addition, a lump sum of €1000 per unit is payable at the end of the term, if the policyholder has died as the result of an accident during the term of the policy. The policy is sold through agents, each of whom receives a commission of €5 per unit sold.

Describe in detail how you would set technical reserves for this policy. You may assume that the business is profitable so that there is no need for an additional amount for unexpired risks, and that the company does not discount its technical reserves. You need not consider the effects of outwards reinsurance. [12]