EXAMINATIONS

2 April 2001 (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 State the reasons why a general insurance company may undertake investigations with respect to its investments. [3]

2 You are the actuary for a general insurance company that writes household buildings and contents insurance. List distinct rating factors that are likely to be used to rate this business. [4]

3 (i) Define the term reinstatement premium. [2]

A $1m xs $1m excess of loss reinsurance treaty has the following terms and loss history in the year it was written.

- up front premium of $200,000
- 1 reinstatement at 120% additional premium

In chronological order the only losses (from ground up) to potentially impact this treaty are:

1. $1.5m
2. $5m
3. $1.8m
4. $1.5m

(ii) Calculate how much of each loss is recoverable. [2]

(iii) Calculate the reinstatement premiums generated by each loss. [2]

(iv) Calculate the rate on line of this contract. [2]
[Total 8]

4 (i) Define three year accounting. [1]

(ii) Explain, with examples, why three year accounting is used. [4]

(iii) At the beginning of year one, 100 premium is received and 5% commission is paid. 10 is paid out in claims halfway through year one, 30 halfway through year 2 and 20 halfway through year 3, and claims handling expenses are 50% of the claims paid.

Calculate the first declared profit for this tranche of business using the three year accounting basis, given investment return of 4% per annum.

State any assumptions that you make. [5]
[Total 10]

5 Discuss the different approaches which could be used to protect policyholders following the insolvency of a general insurance company. [8]

6 Discuss briefly the validity of each of the following statements.

(a) When calculating loss ratios to maintain correspondence…

- … paid claims should be compared with written premium
- … accident year claims should be compared with earned premium
- … incurred claims should be compared with earned premium
- … underwriting year claims should be compared with written premium

(b) Surplus Reinsurance is a form of non-proportional reinsurance.

(c) Deferred acquisition costs are shown as a liability on the balance sheet.

(d) The Basic Chain Ladder method assumes that the oldest year is fully run-off.

(e) The paid chain ladder method produces lower IBNR estimates than the incurred chain ladder estimate due to outstanding claims being included in the latter. [9]

7 You are an actuary for a general insurance company which writes private motor insurance.

Describe briefly the reasons why you may undertake an actuarial investigation of premium rates for this business. [6]

8 You are the actuary for a general insurance company and are about to perform a premium rating exercise for a class of personal lines business.

(i) List the claims data needed to perform the premium rating exercise. [4]

(ii) Explain briefly why the introduction of new premium rates is likely to take place some time after the period of the base claims. [3]

(iii) (a) Describe briefly the problems that may arise as a result of introducing a new premium rating basis some time after the period of the base data used in deriving the new premiums.

(b) Explain how these problems may be mitigated.

[9]

(iv) State the non-claims related factors to be taken into account before deriving the final premium to be charged to the customer. [6]

[Total 22]

9 You are the actuary for a medium sized general insurance company that writes household insurance business. The cumulative paid and notified (paid plus outstanding) claims for this class of business for the last five years of underwriting are shown below:

Paid Claims ($000)

Underwriting Year	*0*	*1*	*2*	*3*	*4*
1996	10	20	30	40	50
1997	9	21	32	41	
1998	10	23	35		
1999	10	27			
2000	11				
Assumed Development Pattern	18%	41%	61%	80%	100%

Notified Claims ($000)

Underwriting Year	*0*	*1*	*2*	*3*	*4*
1996	40	80	78	77	77
1997	40	86	80	77	
1998	41	77	87		
1999	46	79			
2000	46				
Assumed Development Pattern	53%	102%	103%	100%	100%

(i) Discuss the reasonableness of the above assumed development patterns of paid and notified claims. [8]

(ii) Discuss how the ultimate claim cost estimated by the Basic Chain Ladder method would be affected if during 2000 there had been a major hurricane that had caused the paid losses in underwriting year 2000 to be 50 instead of 11 and the notified losses to be 100 instead of 46. [6]

(iii) Discuss how the accuracy of the ultimate claim cost estimated by the Basic Chain Ladder method in part (ii) could be improved. [3]

(iv) Calculate, in respect of the 2000 underwriting year, the discount factor to be applied to the undiscounted outstanding claims reserve to give the discounted reserve as at 31/12/2000. Assume a 10% interest rate and that the assumed development patterns given in the question are correct.

State any further assumptions you make. [6]

(v) Discuss the effect on the technical reserves the company may hold if the information given was for Accident Year instead of Underwriting Year but all the numbers within the triangles were unchanged and you were preparing Accident Year accounts instead of Underwriting Year accounts. (You are not required to explicitly calculate any reserves.)

State what additional information you would need to be able to quantify this. [7]

[Total 30]