EXAMINATION

1 October 2007 (am)

Subject SA3RSA — General Insurance Specialist Applications

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 3 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 A student has produced the following tax calculation for a SA resident proprietary general insurance company. The company writes only SA business.

Investment Returns	*Accounting Data*	*Student's Calculation*
Purchase price of fixed interest securities	500.0	
Market value of fixed interest securities as at 1/1/2006	625.0	
Market value of fixed interest securities as at 31/12/2006	625.0	
Accrued investment income during 2006	25.0	
Return on fixed interest assets		145.0
Purchase price of SA equities	30.0	
Market value of SA equities as at 1/1/2006	55.0	
Market value of SA equities as at 31/12/2006	85.0	
Realised profit on SA equities during 2006	15.0	
Net dividend income during 2006	2.0	
Return on SA equities		57.0
Underwriting Result		
Unearned premiums b/fwd	45.0	
Written premiums	100.0	
Unearned premiums c/fwd	50.0	
DAC b/fwd	9.0	
Acquisition costs paid	18.0	
DAC c/fwd	10.0	
Reinsurance purchased on 1 January for 2006	20.0	
Earned Premiums net of DAC and Reinsurance		56.0
Outstanding and IBNR claims b/fwd	485.0	
Net Claims paid in 2006	60.0	
Outstanding and IBNR claims c/fwd	475.0	
Transfer to equalisation reserve	10.0	
Additional provision for future catastrophes	4.0	
Claim handling expenses incurred in 2006	3.0	
Provision for future claim handling expenses for claims incurred in 2006	5.0	
Increase in claims and claims provisions		72.0
Staff and buildings costs	10.0	
Underwriting Result		176.0
Tax @ 30%	52.8	
Underwriting result after tax		**123.3**

Correct the student's tax calculation and state briefly the underlying principles that explain any changes made.You may ignore any interim arrangements and can assume that the accounting items given are correct. [11]

2 Company A is a large insurance group with worldwide operations. One of its small subsidiary companies, Company B, is a UK company that started writing international property and liability reinsurance business in 1950. Company B took the decision to pull out of the US reinsurance market in 1980 and since then has focused on writing a small and very profitable European property reinsurance book. Company B's discontinued portfolio currently consists largely of US Asbestos, Pollution and Health Hazard ("APH") liabilities. In recent years, Company A has needed to inject more capital into Company B following reserve deteriorations on the US APH liabilities. The technical reserves for Company B are established on a discounted basis.

The Board of Company A is currently considering selling Company B in view of Company A's worldwide strategy to focus on writing direct business.

(i) Describe the major areas of risk facing Company A in respect of the APH claims liabilities of Company B. [7]

(ii) Suggest the benefits to Company A of selling Company B. [5]

(iii) Discuss alternative options open to Company A to remove the risks of the APH liabilities within Company B, explaining their advantages and disadvantages. Company A has already dismissed the use of an adverse development cover. [10]

Company C has shown an interest in acquiring Company B's APH liabilities from Company A. Company C has proposed that it acquires the APH liabilities in return for the transfer of assets equivalent to the discounted claims reserves (including claims handling expenses) on a High estimate basis, where High estimates are deemed adequate in 90% of future possible outcomes.

The company actuary for Company B has provided the following estimates in respect of the APH liabilities as at 31 December 2006.

Figures in US$m	*Case reserves*	*Annual Average Paid (last 3 years)*	*Best estimate reserves*		*High estimate reserves*	
			Undiscounted	*Discounted 4%*	*Undiscounted*	*Discounted 4%*
Asbestos	12.8	2.7	51.3	34.5	77.0	48.8
Pollution	12.1	4.5	24.1	19.8	36.2	29.7
Health Hazards	1.0	0.8	2.0	1.8	3.0	2.5
Subtotal	**25.9**	**8.0**	**77.4**	**56.2**	**116.1**	**81.0**
Claims handling expenses		1.0	3.1	2.5	4.6	3.8
Total		**9.0**	**80.5**	**58.7**	**120.7**	**84.8**

Company B's assets have produced investment return averaging 4.2% per annum over the last 3 years.

(iv) Suggest the benefits to Company C of acquiring the APH liabilities. [5]

(v) (a) Estimate the discounted mean terms of each claim type on each of the Best estimate and High estimate bases.

(b) Comment on the reasonableness of the relative length of these discounted mean terms. [9]

(vi) Set out the challenges that you would make in regard to the numbers in the table above when assisting Company C in its initial price negotiations for this portfolio. [9]

[Total 45]

3 You have recently joined a large SA general insurance company and you are determining the reserves for a portfolio of business in the first quarter of 2007, using annual data as at 31 December 2006. The company business plan for the 2004 year shows a planned ultimate loss ratio of 85%. The company stopped writing this portfolio at the end of 2004.

You have the following summary information readily available:

	Underwriting Years						
	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
Premiums R million	17.2	17.4	17.6	18	20.1	0	0
Reported loss ratio	87.0	82.0	69.0	50.0	34.6		
Basic chain ladder ultimate loss ratio %	90.5	93.0	90.0				
Booked ultimate loss ratio %	91.0	93.0	89.6	92.0	85.0		
A priori * loss ratio %	91.0	93.0	89.6	92.0	85.0		
Mean term of paid claims In years	4.0						

Development year	1	2	3	4	5	6	7	8	9
Age to age factors *n* to *n* + 1(reported claims)	10.00	3.00	1.80	1.40	1.15	1.09	1.03	1.01	1.00

* a priori in this context refers to the initial estimate ultimate loss ratio used in the Bornhuetter-Ferguson calculation

As part of your review you investigate other sources of information. You discover that:

- The 2003 and prior years are running off as planned.
- A company pricing database shows that the average rate change across policies in 2004 is minus 10%.

The ex-underwriter of the account tells you that he feels that rates were showing a ten to fifteen percent reduction and that some policies had wordings which gave wider coverage than in previous years.

(i) (a) Calculate the Bornhuetter-Ferguson and chain ladder estimated ultimate loss ratios for the 2003 and 2004 years.

(b) Comment on the difference between the Bornhuetter-Ferguson and chain ladder expected ultimate claims.

[6]

(ii) (a) Derive three alternative a priori loss ratios for use in the Bornhuetter-Ferguson method for the 2004 year.

(b) Calculate three alternative Bornhuetter-Ferguson ultimate loss ratios using your estimates from part (a) and tabulate your results.

[5]

(iii) (a) State the concerns that you would have with the 2004 initial a priori loss ratio and the new a priori loss ratios you have derived in part (ii).

(b) Comment on the calculated ultimate loss ratios. [9]

The company finance director tells you that it has always been company practice to use the budgeted loss ratios in the Bornhuetter-Ferguson calculations. He has seen your table of results and states that the Bornhuetter-Ferguson method is not credible as it can give any result that you may want. He tells you that he intends to use the ultimate claims using the budgeted loss ratio in the Bornhuetter-Ferguson calculation.

(iv) Discuss the finance director's comment on the credibility of the Bornhuetter-Ferguson method. [5]

(v) (a) Select one a priori ultimate loss ratio for the 2004 year and calculate the increase in reserves needed if the company changes its a priori loss ratio to your figure and

(b) Comment on the materiality of this difference if the company follows its usual practice. [5]

A broker has approached the company offering to arrange an adverse development cover to reinsure this portfolio at a price that you estimate to be best estimate loss cost plus 30% load plus brokerage.

(vi) Explain the term adverse development cover. [2]

(vii) Explain the risks to the ceding company of reinsuring this portfolio and the risks to the reinsurance company of writing this portfolio and explain what each company can do to mitigate its risks. [9]

(viii) State with reasons whether you think that such a policy would be appropriate in this situation. [3]

[Total 44]

END OF PAPER