INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

27 April 2011 (pm)

Subject SA3 — 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 both 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 from the approved list.

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1 Champion is a Lloyd’s managing agent, managing the affairs of the CHUM Syndicate. A new Chief Financial Officer (CFO) has joined the managing agent and is reviewing the business written by CHUM and its underwriting agencies under binding authorities.

CHUM writes business through the slip system as well as through two underwriting agencies, Agency A and Agency B. The following table has been prepared by the CFO for the year ending 31 December 2010:

Source of Business	*Agency A*	*Agency B*	*Non-Agency Business (slip system)*	*Total*
Premium Income ($ millions)	40	10	50	100
Loss Ratio	70%	10%	50%	54%
Expense Ratio	20%	10%	15%	17%

Having seen these figures, Champion’s CFO has said CHUM should stop doing business through Agency A so as to improve the syndicate’s financial performance. However, CHUM’s senior underwriter believes that Agency A improves the financial performance of the syndicate.

(i) Explain why CHUM’s senior underwriter may be correct. [8]

Another underwriting agency, Agency C, is negotiating with CHUM to obtain a binding authority. Agency C is a long established business selling insurance to large hotels located throughout Africa.

(ii) Describe the main features of a binding authority. [4]

(iii) Outline and explain the investigations CHUM should undertake before deciding to issue a binding authority to Agency C. [25]

Agency C has provided CHUM with some analysis of potential claim costs, obtained using a recognised natural catastrophe loss model. Agency C writes $20 million of premium per year.

Scenario	*Modelled Claim Costs ($ millions)*
1 in 5 year loss	2
1 in 40 year loss	10
1 in 200 year loss	15
1 in 1,000 year loss	25

(iv) Discuss why the natural catastrophe model may mis-estimate the potential for large losses from the portfolio. [8]

(v) Describe approaches that could be used to obtain alternative estimates of the loss potential. [7]

[Total 52]

2 A consulting actuary is advising a regional transport authority in a major city. The transport authority is introducing a new bicycle hiring scheme. A large pool of bicycles is to be made available across the city, stationed at a number of specially-erected docking stations. There are to be two categories of scheme participants: fee-paying account holders and casual users. Account holders register their details online and pay daily, weekly or annual fees. In return, they are issued with a key to access the bicycles. Casual users may access the bicycles on a pay-as-you-go basis, requiring a bank card with sufficient funds to cover a deposit as well as the access fee.

The bicycles, docking stations, web service and other equipment and services have been provided by a number of specialist suppliers.

(i) Outline the different insurance needs of:

(a) the scheme provider
(b) the specialist suppliers of the scheme
(c) cyclists, as road users taking part in the scheme [6]

The scheme has considered ways in which these insurance costs can be passed on to the scheme's users. Two alternative ways of charging for the insurance costs within the hire fees have been proposed – differential pricing or a flat-rate fee.

(ii) Outline the factors and further considerations relevant to:

(a) a differential pricing framework
(b) a flat-rate fee [8]

(iii) List the advantages and disadvantages of each approach. [3]

The scheme provider has ruled out differential insurance charges for users. Fees will however incorporate incentives to encourage users to register online and take up the weekly or annual option.

(iv) Outline alternative options for the charging framework and scheme design to pass on insurance risk to the participants. [3]

The transport authority has established a captive insurer to take on the insurance risks.

(v) Explain what a captive insurer is and give reasons why this may have been the preferred route for insuring the risks of the scheme provider. [4]

(vi) Outline the authorisation process which would be required to set up such a captive. [4]

(vii) List the reinsurance options for the captive, setting out the benefits and capital implications of each option. [10]

The bicycle scheme was introduced on 1 April. It has now been running for six months. The take-up has been successful and it has been necessary to increase the number of bicycles by 50% available in the pool. A comprehensive reinsurance programme was effected when the scheme started with both proportional and non-proportional cover. The results and key information for this business at 30 September are as follows:

All amounts in £000s

Insurance Liabilities	
Net Claims Reserve	700
Net Premium Reserve	400
Total Reserve	1,100

Additional information:

	Actual to 30 Sept	*Original Planned 1st Year*	*Original Planned 2nd Year*
Net written premium	1,000	1,450	1,950
Expenses	300	360	480
Loss Ratio	85%	70%	65%

The Finance Director of the captive has asked for an assessment of the projected year-end profitability of the scheme for the insurance company.

(viii) Outline the factors that would be considered in assessing the profitability and the sources of uncertainty attaching to this assessment. [10]

[Total 48]

END OF PAPER