

# INSTITUTE AND FACULTY OF ACTUARIES



## EXAMINATION

26 September 2013 (am)

### **Subject ST7 – General Insurance: Reserving and Capital Modelling Specialist Technical**

*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 eight 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.*

- 1** Define fidelity guarantee insurance and directors' and officers' liability insurance, identifying the key difference between them. [2]
  
- 2** A general insurance company writing product liability insurance is considering its investment options. The Government has recently issued a new index-linked government loan which pays a nominal coupon of 1% per year. Both the coupon and the capital value of the loan are indexed to the local consumer price index. It matures in 10 years' time.

Explain whether the stock should be purchased by the company. [8]
  
- 3** A large multinational insurer has introduced asset/liability modelling (ALM) across its businesses in different countries.

  - (i) List the variables that are likely to be modelled within the economic scenario generator section of the model. [2]
  - (ii) Suggest interdependencies between assets and liabilities that should be considered for representation within the ALM framework. [4]
  - (iii) Outline key operational controls that should be in place around the assumptions that are used in the model. [4]

[Total 10]
  
- 4** An insurance company intends to introduce a new product that would protect homeowners against future negative equity (a shortfall in market value relative to outstanding loan amount) when their houses are sold. The product would involve a proportion of the house cost being retained by the insurer on purchase of the property. The insurer would then indemnify the policyholder against any shortfall on the sale of the property subject to independent valuation.

  - (i) Comment on the appropriateness of possible distribution channels for the product. [3]
  - (ii) Describe the specific risks for the insurer from launching this particular product. [7]

[Total 10]
  
- 5** In projecting actuarial estimates, three main types of uncertainty can be distinguished.

Describe each type of uncertainty, using examples to illustrate the differences between them. [6]

- 6 The management of a general insurance company has been concerned that for some years its claims handling processes have been ineffective. Delays have become common, claims have been paid that should have been rejected and excessive amounts have been paid on valid claims.

A new claims-handling protocol has been developed to remedy these problems and there has been extensive staff training. The new procedures are to be introduced on 1 January 2014. The senior management of the company have discussed the project with the reserving actuary and it is evident that they expect the reserves as at 31 December 2013 to reflect the prospective improvements.

Discuss the issues that the actuary should consider and the extent to which he should allow for them when taking account of these changes in his work on the year-end reserves. [12]

- 7 (i) List the advantages and disadvantages of an insurer writing business through a Lloyd's syndicate. [4]

The table below shows the initial summary results for the capital model of a Lloyd's syndicate.

<i>Risk type</i>	<i>Capital requirement (£m)</i>
Reserving risk	405
Underwriting risk	120
Aggregate insurance risk	550
Market risk	35
Counterparty default risk	85
Operational risk	15
Liquidity risk	25
<b>Total syndicate capital requirement</b>	<b>475</b>

- (ii) Comment on the amounts shown in the table, considering both the reasonableness of the figures and what they show about the syndicate. [11]

The capital model outputs have been reviewed by Lloyd's, and the managing agency has been advised that the syndicate would require a higher level of capital to support its business plan for the next underwriting year.

- (iii) Describe options available to the syndicate. [6]  
[Total 21]

- 8 A small general insurance company writes liability insurance through regional brokers and the London Market. The company is newly established, having started writing risks on 1 July 2012. The professional indemnity class of business currently accounts for most of the business written by the company. The company needs to estimate outstanding reported claims and IBNR requirements as at 31 December 2012 for the purposes of the company's year-end accounts. The company accounts for its business on a one-year accounting basis.

In addition to the company's own detailed policy and claims information, it has been decided to obtain benchmark claims development and loss ratio information from publicly available sources. The information available is paid, incurred and ultimate loss ratios by year of account submitted by 10 different insurance companies. The specific 10 companies were chosen because they provide a professional indemnity classification within their returns.

Having collected this information it has been realised that it may not be appropriate to include data relating to all of the 10 companies in the benchmark review.

- (i) Explain the distinguishing aspects of each professional indemnity account that should be investigated when selecting the most appropriate loss ratio benchmarks for reserving purposes. [12]

The following are the selections made, weighted by volumes of business:

	<i>2009 Returns</i>			<i>2010 Returns</i>			<i>2011 Returns</i>		
	<i>PLR</i>	<i>ILR</i>	<i>ULR</i>	<i>PLR</i>	<i>ILR</i>	<i>ULR</i>	<i>PLR</i>	<i>ILR</i>	<i>ULR</i>
2008	20%	89%	120%	40%	108%	125%	83%	120%	122%
2009	6%	34%	89%	22%	65%	85%	41%	75%	87%
2010				7%	32%	69%	23%	42%	65%
2011							3%	23%	59%

PLR = paid loss ratio

ILR = incurred loss ratio

ULR = ultimate loss ratio

(Note that the ILR does not include IBNR or IBNER claims)

Rate changes over the past four years have been provided by the underwriter and are as shown in the table below.

Underwriting Years Premium Rate Change:

2008–2009	+ 50%
2009–2010	+ 25%
2010–2011	+10%
2011–2012	–5%

- (ii) Describe how the information provided in the tables above might be used to estimate a benchmark ultimate loss ratio for the 2012 accident year, stating the additional information that might be required from the underwriter. [8]
- (iii) Estimate a benchmark 2012 ultimate loss ratio using the information provided and stating any other assumptions used. [4]
- (iv) (a) Estimate average paid and incurred claims cumulative development percentages for a typical accident year at the end of the first, second, third and fourth development years.
- (b) Comment briefly on the reliability of your results.

[7]

[Total 31]

**END OF PAPER**





