INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

1 October 2015 (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 seven questions, beginning your answer to each question on a new page.*

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 three ways in which claims notifications are classified in insurance and/or reinsurance policy wordings. [3]

2 Describe the operation of the underwriting cycle. [5]

3 Outline methods of allowing for diversification in a capital model. [6]

4 (i) Define the following terms:

(a) earned premiums
(b) unearned premiums
(c) unearned premium reserve
(d) binding authorities
(e) slip system

[6]

A Lloyd's syndicate covers construction all risks insurance through a binding authority and employers' liability insurance through the slip system.

(ii) Explain why the syndicate may not know with certainty the premium it will receive for these policies on their start date. [6]
[Total 12]

5 (i) List four typical investment policy objectives for a general insurer. [2]

A Lloyd's agency writes excess layer commercial property insurance in the United States. They are required to hold assets covering 100% of their estimated unpaid claims liabilities within a US Trust Fund, gross of any reinsurance recoveries expected.

(ii) Discuss the implications of this funding requirement for their investment policy. [8]

(iii) Outline ways that this funding requirement might be reflected in the capital model design and parameterisation. [5]

(iv) Suggest how this funding requirement might impact on their reinsurance buying and liquidity management strategies. [5]
[Total 20]

6 (i) List five uses of stochastic reserving models. [5]

A small insurer has been writing commercial property and motor business for 10 years. The company holds gross reserves of £30m for commercial property and £16m for motor.

The reserves are calculated deterministically and the reserve risk is estimated by bootstrapping gross incurred claims using an overdispersed Poisson model.

The reserve risk results are used to assist in setting solvency capital and to indicate to the Board a reserve range as follows:

- The reserve risk solvency capital is set at the 99.5th percentile of the unpaid loss distribution.
- The lower and upper end of the range of reasonable best estimates are defined as the 25th and 75th percentile of the gross unpaid loss distribution.

(ii) Explain the suitability of using this approach to define the range of reasonable best estimates. [8]

At the end of September 2015, the following gross reserve risk results have been produced:

£m's

Percentile	*Commercial Property*	*Motor*	*Total*
25th	26	17	43
50th	28	18	46
75th	30	19	49
99.5th	37	21	58
Standard Deviation	3	1	4
Mean	28	18	46
Held Gross Reserves	30	16	46

These figures are being reviewed before they are presented to the Board for the first time.

(iii) Outline the points an actuary would raise as part of this review. [7]

(iv) Suggest other information an actuary might include in the presentation to the Board to aid their understanding of the above reserve uncertainty figures. [5]

[Total 25]

7 (i) Define the terms IBNER and Pure IBNR. [2]

(ii) Suggest with reasons the likely relative balance of these two amounts for the following portfolios of business:

(a) personal accident
(b) professional indemnity
(c) employers' liability
(d) commercial property written with a minimum $25m excess

[11]

(iii) Describe how an actuary might use claim count triangles to separate reserves between IBNR and IBNER. [5]

An insurer began writing mobile phone insurance on 1 January 2014. At 31 December 2014 they are seeking to derive pure IBNR estimates. However, the insurer does not have any transactional development data and so cannot produce claim count triangles. Individual claim data is available including latest incurred amounts, date of loss and date reported.

Using this information the insurer has compiled the following table of incurred amounts by monthly reporting delay:

Delay (months)	*Incurred (£m)*
1	3.5
2	2.5
3	1.5
4	1.0
5	0.7
6	0.5
7	0.2
8	0.1
9	-
10	-
11	-
12	-

The insurer has written £30m of premium (net of acquisition costs) evenly over the year writing only on the first day of each month. The insurer expects a 90% loss ratio.

(iv) Calculate, showing all your workings, an IBNR reserve. State any assumptions made. [8]

(v) Comment on the reasonableness of your results. [3]

[Total 29]

END OF PAPER