

INSTITUTE AND FACULTY OF ACTUARIES



EXAMINATION

4 October 2017 (pm)

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 must not start writing your answers in the booklet until instructed to do so by the supervisor.*
3. *You have 15 minutes of planning and reading time before the start of this examination. You may make separate notes or write on the exam paper but not in your answer booklet. Calculators are not to be used during the reading time. You will then have three hours to complete the paper.*
4. *Mark allocations are shown in brackets.*
5. *Attempt all nine 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** Describe “seasonality” in the context of a reserving exercise, giving three examples. [4]
- 2** (i) Define “facultative reinsurance”. [1]
(ii) State four situations in which facultative reinsurance is commonly used. [4]
[Total 5]
- 3** (i) Describe “discovery period”. [2]
(ii) State with a reason whether discovery periods are likely to apply for each of the following:
(a) UK Employer’s Liability policy
(b) Run-off D&O policy
(c) Commercial Property policy
[3]
[Total 5]
- 4** (i) Define “process uncertainty”. [1]
(ii) List ten possible sources of process uncertainty. [5]
[Total 6]
- 5** A large insurance company has recently held its quarterly Investment Committee meeting. One of the non-executive directors (NED) has observed that the company has a large holding of long-dated government bonds with negative gross redemption yields.
- (i) Discuss the appropriateness of this strategy. [8]
- The NED has suggested that the company would be better off investing in term deposits (an investment of cash with a bank for a fixed term paying a fixed rate of interest on assets held for the term) or holding physical cash in a vault.
- (ii) Comment on these suggestions. [4]
[Total 12]

- 6** (i) Describe the five main accounting concepts for general insurance accounting. [5]
- (ii) Explain whether each of the following situations would be consistent with these five concepts, stating the relevant concept(s) in each case:
- (a) Accounts have been prepared assuming that the company is expected to continue in operational existence for the foreseeable future.
 - (b) The cost of a reinsurance contract that protects insurance risks attaching during the next 24 months is accounted for in full in the current year.
 - (c) Technical provisions have been selected as a 7.5% uplift on the best estimate reserves, having been maintained at the 75th percentile of the reserve distribution for the last five years.
 - (d) Accounts have been prepared assuming that the profit for all business written during the year is recognised during the year.
 - (e) A major earthquake has occurred two weeks after the valuation date resulting in a significant additional liability anticipated to be in excess of the provision estimated at the valuation date. Accounts have been prepared ignoring the additional liability.
 - (f) An insurer holds a significant bond portfolio with a number of fixed term bonds of varying known durations. Accounts have been prepared valuing the bond portfolio assuming an average duration and yield.
- [9]
[Total 14]

- 7 A reinsurer has a portfolio of business written on a risks attaching basis. A student actuary is considering calculating its earned premium provision using the 24ths method.

- (i) Discuss the suitability of this approach. [5]

The reinsurer is conducting a reserve review exercise for its half-year accounts. The last detailed exercise was conducted at the previous calendar year end.

The following cumulative development factors (CDF) were used at the last review:

Year	1	2	3	4	5	6
CDFs	4.55	2.11	1.60	1.33	1.20	1.11

The following information is available on 30 June 2017 on an underwriting year (UY) basis:

<i>UY</i>	<i>Annual Written Premium £m</i>	<i>Initial Expected Loss Ratio</i>	<i>Incurred Claims £m</i>
2012	10.47	89%	9.78
2013	12.97	91%	10.02
2014	11.23	90%	6.93
2015	12.59	85%	5.77
2016	14.63	77%	4.57
01/01–30/06/17	13.15	79%	2.32

- (ii) Calculate the loss ratio by year on an accident year basis using the Bornhuetter-Ferguson method, stating any assumptions you make. [9]

- (iii) Comment on the results. [3]

[Total 17]

8 “Dramatic Truckers” is a popular television programme about trucking (heavy vehicle) companies operating in dangerous parts of the world. Company X is a television company which produces the programme, and it is about to begin filming a new series of the show.

- (i) State, with reasons, the main types of insurance that Company X is likely to want to buy. [6]

Having considered the main types of insurance, Company X is discussing whether insurance could be obtained for additional business risks. It wishes to obtain the following cover:

- (a) Reimbursement for loss of revenue if the programme is not sufficiently dramatic.
- (b) Insurer to pay Company X \$1 million if “Dramatic Truckers” were to win “Best Show” at the annual TV industry awards.
- (ii) Determine whether these exposures are likely to be insurable, with reference to each of the criteria for insurability. [12]

[Total 18]

9 A medium sized insurance company writes overseas property insurance. It is using its capital model to optimise its quota share and excess of loss programmes for business to be written over the next year.

- (i) List the relevant reinsurance data items which are likely to be required by the model. [5]
- (ii) Describe six metrics which could be produced from the model’s output to assist in this decision, including the rationale for using each metric. [9]
- (iii) Suggest possible problems the company may face when attempting to use the model for this purpose. [5]

[Total 19]

END OF PAPER