

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

21 April 2011 (am)

Subject ST1 — Health and Care 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 before 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 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.

<p><i>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.</i></p>
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- 1** A health and care insurer is considering whether to use model points or full data for its actuarial modelling.
- (i) Discuss the relative merits of these two approaches. [6]
 - (ii) Describe the factors that the company would take into account when setting model points. [4]
- [Total 10]
- 2**
- (i) Define keyperson insurance cover, giving two categories of policy design. [2]
 - (ii) Outline the possible target market and how the sum assured might be set, for each of these two categories. [3]
 - (iii) Outline the key risk management issues that might arise for an insurance company as a result of writing this type of business. [4]
- [Total 9]
- 3** An insurance company writes private medical insurance, critical illness insurance, income protection insurance and immediate needs annuities, in many countries around the world.
- One of its non-executive directors has heard about a blood test that has been developed and is now undergoing trials. The claim is that the test can detect a particular protein, a high level of which is a very good indicator of the onset and development of a form of senile dementia called Alzheimer's disease. It is thought that this protein marker appears up to ten years in advance of the onset of this disease.
- The non-executive director has asked what the effects of the introduction of this blood test will be on each of the types of insurance business written.
- Outline the points that should be made in response, including actions to be taken by the insurer. [9]
- 4**
- (i) List the sources of risk that a health and care insurer commonly faces. [5]
 - (ii) Suggest ways in which a health and care insurer can manage its risks. [12]
- [Total 17]

- 5** The government of Actuaría pays a weekly cash benefit to any of its citizens after six months' absence from work by reason of sickness or injury. The benefit is paid until the first of the following events: the claimant recovers and returns to work, dies or reaches normal retirement age, which is currently 65 for both males and females.

There are regular checks on benefit entitlement for all claimants currently residing in Actuaría. These checks can include a face-to-face interview with a government employee to establish that the claimant is still incapacitated and not working, and/or a physical examination by a government doctor to check on the current incapacity and future fitness to work. In the event that the citizen is declared fit for work, the benefit ceases. Checks are not made on claimants residing outside Actuaría.

Recently, a member of the Actuaría Parliament has stated that some form of check on benefit claimants residing outside Actuaría will be introduced.

- (i) Suggest the data items required in order to assess the current amount of claims liability in respect of those living outside Actuaría. [4]
 - (ii) Discuss the checks that the government might implement for benefit claimants residing outside Actuaría. [4]
 - (iii) Outline the problems that may arise if the claimants living outside Actuaría are required to undertake a physical examination by a designated doctor. [3]
- [Total 11]

- 6** A health and care insurer has a portfolio of private medical insurance (PMI) business written in the country of Actuaría. It also has a reinsurance subsidiary in a different country, Bankonia.

Actuaría is currently undergoing major changes to its insurance regulations and it is expected that the capital requirements under the new regime are likely to increase significantly.

It has been suggested that a significant proportion of the insurer's PMI business should be reinsured to the subsidiary in Bankonia with the aim of reducing the overall capital requirements.

Describe the considerations when assessing this suggestion from the perspective of:

- (i) the health and care insurer in Actuaría [9]
 - (ii) the reinsurer in Bankonia [8]
 - (iii) the overall group [3]
- [Total 20]

- 7**
- (i) Explain what is meant by the following terms as used in health and care insurance:
 - (a) Continuation option
 - (b) Guaranteed insurability option
 - (c) Buy-back option

[5]
 - (ii) Explain the principles which determine the cost of an option.

[3]
 - (iii) Outline three ways in which an option could be valued (formulae are not required).

[6]
- A health and care insurer writes stand-alone critical illness (CI) policies.
- (iv) State with reasons which method would be most appropriate to value the options that could be offered under this product type.

[3]
 - (v) Outline the main risks of writing options under stand-alone CI policies, and how these risks can be managed.

[7]
- [Total 24]

END OF PAPER