

# EXAMINATION

16 September 2005 (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 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 9 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.*

- 1** For income protection insurance:
- (i) Define with examples the term deferred period. [1]
  - (ii) Explain with examples the definition of incapacity. [2]
  - (iii) Define the term “activities of daily living”. [1]
  - (iv) Explain the term “replacement ratio”. [2]
  - (v) Explain the concept of rehabilitation/partial benefit. [1]
- [Total 7]
- 2** You are the actuary of a leading critical illness insurance provider. Your marketing director has suggested that the critical illness definitions used should be amended to differentiate your products from those offered in the market by other companies.
- Discuss the marketing issues implied by this suggestion and indicate how they might be mitigated if such a strategy were followed. [5]
- 3** The country of Actuarialia has no state healthcare provision for the population. A scheme has been proposed under which an earmarked increase in income tax will be applied to all citizens of Actuarialia to fund a national health system to ensure that all citizens have access to free medical care.
- (i) Outline reasons for implementing such a scheme. [4]
  - (ii) The finance minister wishes to contain the cost of the scheme by maintaining an element of self-provision. Describe possible means of doing this. [3]
- [Total 7]
- 4** For a typical non-profit hospital cash (health cash) insurance contract:
- (a) Discuss the various criteria which must be met in order for claim benefits to become payable under the contract.
  - (b) Describe the ways in which the amount of benefit is determined in the event of a claim becoming payable under the contract.
  - (c) State the guarantees which might be provided.
- [7]

- 5** A proprietary life insurance company writes individual long term care business.
- (i) Describe the investigations you would undertake to determine an appropriate investment strategy. [8]
  - (ii) The regulatory framework may limit what a company may do in terms of investment. List the types of restriction that may apply. [3]  
[Total 11]
- 6** A proprietary long term insurance company writes individual critical illness contracts which have reviewable rates.
- (i) List four reasons why the company would wish to monitor claims experience. [2]
  - (ii) List the data items you would ideally require to make a full claims experience analysis. You should include all of the rating factors that are likely to be used for setting premium rates. [6]
  - (iii) Describe the other factors you would consider before deciding to change premium rates for existing business. [4]  
[Total 12]
- 7** A long term insurance company writing individual income protection business is about to calculate its supervisory reserves for active life business using a gross premium valuation method.
- (i) State the principles that should be used for setting the bases for each of the following:
    - (a) Interest rate
    - (b) Mortality
    - (c) Morbidity
    - (d) Expenses[12]
  - (ii) Discuss how the basis might relate to that used to price the product. [2]  
[Total 14]

- 8** XYZ is a country which does not provide any medical or other healthcare benefits for its citizens. Some of the population receive and pay for medical treatment in other countries, the remainder are treated by private doctors or in privately owned hospitals in XYZ.

You are the pricing actuary for the XYZ State Life Insurance Company. This is the only insurance company that is allowed to offer life and health insurance products to XYZ citizens.

The company has decided to launch a new conventional non-profit medical expense insurance policy, under which premiums and benefits are not guaranteed for the duration of the contract. The company has never before issued conventional medical expense insurance policies.

- (i) List the data sources normally available for pricing this line of business (e.g. in a developed market) and indicate those which would and would not be available in the circumstances mentioned above. [5]
  - (ii) Describe any adjustments that you might make for local use. [4]
  - (iii) Recent research has shown that the incidence of cigarette smoking in XYZ is 10% of the level in the territory from which the statistics are drawn. Comment on how you would allow for this factor in the pricing for each of the sources of data quoted in answer to part (i). [3]
  - (iv) It has been suggested that the medical expense insurance contract should only pay benefits to policyholders who receive medical treatment in XYZ. Comment on the advantages and disadvantages of such a policy provision. [4]
- [Total 16]

- 9** You are the pricing actuary for a well-established long term insurance office that has been writing income protection business for some years. Your sales director, who has recently joined the organisation from another industry, has sent you an email in which he expresses concern at the cost of income protection.

Describe typical means of reducing the premium for income protection and the risks associated with each. [21]

**END OF PAPER**