

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

23 September 2014 (pm)

Subject SA1 – Health and Care Specialist Applications

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 three 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.

<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 In the country of Actuarialia, a comprehensive State healthcare system currently exists.

The government of Actuarialia is introducing new legislation, with immediate effect, whereby private hospitals will need to provide 10% of their treatments and services for free. To ensure fairness, the free treatments and services that need to be provided by each hospital will be set and monitored by an independent company. This company will also decide who receives the free treatments.

- (i) Suggest reasons why the government has introduced this new legislation. [4]
 - (ii) Discuss the potential implications of the new legislation for private hospitals, including the actions that they might take. [8]
 - (iii) Discuss the potential implications of the new legislation for private medical insurance providers, including the actions that they might take. [8]
- [Total 20]

2 A health insurer which sells individual income protection and private medical insurances is in the process of calculating its technical provisions and capital requirements under Pillar 1 of Solvency II.

- (i) Describe how the insurer might determine the best estimate liability for the income protection insurance business. [13]
- (ii) Describe how the risk margin could be determined for the income protection insurance business. [It is not necessary to describe the Solvency Capital Requirement (SCR) calculation.] [8]
- (iii) Describe the main standard formula components of the SCR for:
 - (a) the income protection insurance business
 - (b) the private medical insurance business[11]

Under the requirements of Solvency II, the insurer will need to have a quicker and more frequent reporting process.

- (iv) Suggest approaches that the insurer could take to improve its reporting efficiency and hence meet these requirements. [13]
- [Total 45]

- 3** A UK proprietary health insurance company sells a conventional individual stand-alone critical illness product. The pricing model showed this product to be profitable.

The sales director has suggested introducing a new critical illness (Dalgaard Syndrome) into the cover, for all new business. Dalgaard Syndrome is a severe condition affecting the nervous system and is currently diagnosed by the existence in the blood of a specific enzyme.

Initial analysis suggests that the claim costs will increase by 2.5% as a result of the inclusion of this new critical illness.

The product is reinsured on a 50% quota share risk premium basis and the reinsurer is prepared to include this additional critical illness for a 2.5% increase in the treaty reinsurance premium rates.

The insurance company has decided that the premium rates for the new version of the product (with the additional critical illness covered) will be 0.5% higher than for the current version.

It can be assumed that the initial estimate of the additional risk cost is reasonable and that there are no other changes made to the product design or assumptions used.

- (i) Discuss the suitability of this critical illness for inclusion within the product. [3]
- (ii) Explain the likely impact of the proposed changes on the pricing model cashflows and the overall profit for this product. [10]
- (iii) Discuss the wider considerations for the company of such a change to the product. [12]

The marketing director has subsequently asked for the maximum sum insured to be increased from £1 million to £10 million on the amended product.

- (iv) Discuss this suggestion. [10]
- [Total 35]

END OF PAPER