

EXAMINATION

12 November 2014 (am)

Subject F101 — *Health and Care* Fellowship Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Use the instructions and password provided at the examination center to log in.*
2. *Submit your answers in Word format only using the template provided.*
3. *Save your work regularly throughout the examination on the supplied computers' hard drive.*
4. *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.*
5. *You must not start typing your answers until instructed to do so by the supervisor.*
6. *Mark allocations are shown in brackets on exam papers.*
7. *Attempt all seven (7) questions, beginning your answer to each question on a new page.*
8. *Candidates should show calculations where this is appropriate.*

Note: The Actuarial Society of South Africa will not be held responsible for loss of data where candidates have not followed instructions as set out above.

AT THE END OF THE EXAMINATION

Save your answers on the hard drive AND hand in this question paper.

<p><i>In addition to this paper you should have available the 2002 edition of the <i>Formulae and Tables</i> and your own electronic calculator from the approved</i></p>

QUESTION 1

A recent study has been published in a reputable medical journal regarding the long-term health effects of a diet that has been popular for the last decade. The research indicates a strong link between the diet and the incidence of particular cancers.

- i. Outline the characteristics of an illness or condition that make it appropriate for inclusion in a critical illness product. (3)
- ii. Explain how you would expect the impact of the diet on claims experience to vary between providers of critical illness cover. (3)
- iii. Suggest risk management strategies to reduce the impact of this diet on claims experience. (4)
- iv. Describe how you would allow for this new information in reviewing the pricing of your critical illness products (assuming the benefit is not tiered). (4)

[Total 14]

QUESTION 2

A large insurer sells a range of life and health insurance products. For the last twenty years they have sold (annually renewable) medical gap cover to their PMI clients.

- i. Describe medical gap cover and explain what customer needs such products are designed to meet. (2)

The regulator has just announced that no new gap cover business can be sold. However, existing clients will be permitted to renew their cover.

- ii. Discuss the implications for the insurer of this change in the regulatory environment. (8)

The chief actuary has asked you to estimate the number of in-force gap cover policies per year for the next ten years.

- iii. Suggest reasons why you think this would be useful. (2)
- iv. Explain how you would go about doing this. (4)

[Total 16]

PLEASE TURN OVER

QUESTION 3

The product development team at a large health insurer has designed a PMI product aimed at executives of multinational companies. The product is annually renewable and provides indemnity cover anywhere in the world, and evacuation benefits in cases where adequate health care is not available.

- i. Outline the factors that will influence the marketability of the product. (3)
- ii. Identify three key risks associated with this product. (3)
- iii. Explain why the expense loading for direct expenses associated with this product is likely to be high. (5)
- iv. Discuss the usefulness for this product of the following:
 - a. Reinsurance
 - b. Strict eligibility criteria and initial underwriting for participation in the product
 - c. Claim pre-authorisation

(9)

[Total 20]

QUESTION 4

A small insurer offering annually renewable PMI cover currently imposes a moratorium on maternity benefits where pregnancy is a pre-existing condition. The marketing director has suggested removing this moratorium to make the product more attractive to young families. The insurer operates in a regulatory environment that requires community rating and where PMI cover is voluntary.

- i. Outline the advantages and disadvantages of moratorium underwriting for PMI products. (2)
- ii. Explain why the insurer would want to attract young families. (2)
- iii. Evaluate the suggestion from the insurer's perspective, assuming that they only sell individual business. (6)
- iv. Explain how the impact of this suggestion will vary between group and individual business. (3)

[Total 13]

PLEASE TURN OVER

QUESTION 5

- i. Explain how a Generalised Linear Model differs from ordinary least squares regression. (2)
- ii. Explain why multivariate modelling is useful for modelling health insurance claims. (2)
- iii. Outline the advantages of the Tweedie distribution for modelling PMI claims data. (2)

[Total 6]

QUESTION 6

The regulator in a developed insurance market has introduced standardised critical illness definitions and statutory minimum benefits for critical illness products.

- i. List the medical conditions you would expect to find in the statutory minimum benefits. (2)
- ii. Evaluate these regulatory interventions from a policyholder perspective. (4)
- iii. Discuss the benefits of standardised definitions from an insurer perspective. (6)

[Total 12]

QUESTION 7

An insurer selling indemnity long-term care products has contracted with a network of nursing homes to act as approved providers.

- i. Discuss the implications for the insurer of putting in place an approved provider network. (6)

The marketing director is concerned that policyholders will react negatively to a limitation on their choice of facilities. She has suggested that policyholders be able to choose any facility but incur a co-payment for using facilities outside of the network.

- ii. Evaluate the two product design alternatives (limited choice vs. free choice with a co-payment). (6)

The chief actuary has suggested that the facilities be remunerated on either a per-diem or per-case basis.

- iii. Explain how per-diem and per-case reimbursement would work for nursing-home care. (2)
- iv. Discuss this suggestion. (5)

[Total 19]

END OF PAPER