

EXAMINATION

5 June 2013 (am)

Subject F101 — Health & 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 eight (8) 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 Formulae and Tables and your own electronic calculator from the approved list.</i></p>
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QUESTION 1

You are the pricing actuary of a leading individual critical illness provider in a very competitive market. Market research has identified that the critical illness product could be improved by the benefit being paid additionally on the insured being diagnosed with post-traumatic stress.

- i. Discuss the advantages and disadvantages of adding post-traumatic stress to the contract from the insurer's perspective and explain whether you would recommend that this benefit should be added to the contract. [8]
- ii. You have been asked to develop the key morbidity assumptions to set a premium basis for this suggested addition. Outline the key sources of data that are likely to be available and the adjustments that would be required. [5]

[Total 13]

QUESTION 2

The Government of a developed country with a sophisticated healthcare system has announced plans for National Health Insurance aimed at increasing access to healthcare for all citizens of the country. Benefits would include free access to primary care and hospital care. The Government has indicated an emphasis on preventative medicine.

- i. Explain why the State may wish to encourage preventative medicine. [3]
- ii. Discuss the key the key issues involved in developing:
 - a. Smoking cessation courses
 - b. Mammograms [6]

You have been requested to prepare an actuarial report for a large insurer discussing the likely impact of National Health Insurance on their critical illness product.

- iii. Describe the likely effect of increased access to early screening on future critical illness incidence rates, differentiating between tiered benefit and non-tiered benefits. [4]
- iv. Compare and contrast National Health Insurance and critical illness insurance. [5]

[Total 18]

PLEASE TURN OVER

QUESTION 3

As a result of a takeover, a large non-American health insurer has taken control of a small American insurer that has been in run-off for some time. The small insurer wrote significant amounts of long-term care business.

Outline the key factors, internal to the group, that need to be considered when setting an investment strategy for this new subsidiary. It is not necessary to recommend a particular investment strategy.

[Total 8]

QUESTION 4

A health insurer is writing private medical insurance (PMI) business in a market where risk rating is permitted.

- i. Define underwriting. [1]
- ii. Describe how underwriting of PMI business can vary for large groups, small groups and individuals. [6]

The marketing director has suggested that employers who offer wellness programmes to their staff should be offered an automatic discount on group PMI cover.

- iii. Evaluate this proposal from the insurer's perspective and suggest how you would determine the level of the discount. [5]

[Total 12]

QUESTION 5

A health insurer offers a comprehensive medical expense product covering in- and out-of-hospital events. They have experienced a high escalation in costs for dental benefits out-of-hospital and physiotherapy benefits in- and out-of-hospital benefits.

- i. Describe the investigations that you would suggest to analyse the cost escalations. [6]

The insurer is considering using a personal medical savings account for out-of-hospital costs in order to reduce its exposure to these costs

- ii. Discuss the merits of this suggestion. [6]
- iii. Describe two alternative benefit design measures that can be used to manage the insurer's costs. [4]

[Total 16]

PLEASE TURN OVER

QUESTION 6

- i. Explain what a risk-based approach to determining solvency capital requirements entails. [2]
- ii. Identify the main categories of risks facing health insurers and provide an example of a risk-capital charge for each category. [5]
- iii. Discuss the likely differences in risk-based capital between PMI, Critical Illness and Long-term Care Business. [6]

[Total 13]

QUESTION 7

You have just read a report that says that reinsurance capacity for long-term care products has halved over the last five years. The report also indicates that majority of reinsurance for long-term care is quota share.

- i. Outline the key advantages and disadvantages of quota share reinsurance for the direct writer. [3]
- ii. Discuss the possible reasons for decreased reinsurance capacity for long-term care and the likely implications for insurers selling long-term care business. [5]

[Total 8]

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QUESTION 8

You are the reserving actuary for a health insurer selling private medical insurance (PMI). You have been provided with the following cumulative paid claims data for the current year. All figures are in thousands of Rand.

Month	Earned Premiums (net of commission)	Claim amounts					
		Lag					
		0	1	2	3	4	5
Jan	5000	2500	3650	4200	4325	4335	4330
Feb	5500	2150	3225	3775	3965	3960	
March	6000	3250	4500	5050	5150		
April	7000	3700	5200	5775			
May	7500	3300	4800				
June	8000	4250					

- i. Estimate the ultimate loss for each treatment month using the Basic Chain Ladder method, assuming that January is fully run off. [4]
- ii. Comment on the appropriateness of the assumption that January is fully run off. [2]
- iii. Estimate the ultimate loss for each treatment month using the Bornheutter-Ferguson method, assuming a loss ratio of 95%. [2]
- iv. Comment on the appropriateness of the assumption of a constant loss ratio of 95%. [1]
- v. Explain how you would decide which of these two estimates to use and what information you would require to make the decision. [3]

[Total 12]

END OF PAPER