

EXAMINATION

16 November 2010 (am)

Subject F101 — Health & Care Principles 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 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 from the approved list.

QUESTION 1

- (a) The following suggestions have been made as part of the review of regulations for health insurers in a particular country:
- A minimum solvency margin should be proportional to technical reserves;
 - A minimum solvency margin should be proportional to the square root of premium income;
 - There should be a statutory basis for the calculation of technical reserves;
 - All technical reserves plus the minimum solvency margin should be covered by government securities;
 - All reinsurance should be placed with a state owned reinsurance company.
 - The computation for tax on profit is based on technical reserves calculated using the statutory basis.

State briefly possible reasons for each of the suggestions and comment on their suitability or otherwise. (17)

- (b) Discuss why an insurer operating in the country referred to in part (a) may choose to hold reserves different to the statutory minimum requirement and discuss the implications of this on the investment strategy of the company. (6)

(23 marks)

QUESTION 2

An insurer provides an annually renewable individual income protection policy where the benefit is a defined amount per week (payable until the earlier of death, recovery or reaching age 55) and there is a deferred period of one month.

What reserves would the insurer need to hold in respect of this policy, and what assumptions would be required to calculate these reserves?

(9 marks)

PLEASE TURN OVER

QUESTION 3

You are developing a personal accident plan for a mining company. The company would like to offer the policy on a voluntary basis to individual employees in order to provide cover in the event of accidents outside of the work environment. The policy will be priced on an age at entry basis and cover the employee to the normal retirement age.

- (a) Describe and motivate the benefit structure that you would propose for this policy?
(5)
- (b) Describe how the policy would be priced and the likely structure of the premiums.
(7)
- (c) Discuss the underwriting process that you would implement for this policy.
(3)
- (d) The employer would like to offer employees the option to continue the policy after they leave employment. Discuss how you would price such an option and how it could be structured to reduce the cost.
(5)

(20 marks)

QUESTION 4

A health insurer with a large book of Private Medical Insurance (PMI) and Income Protection business is looking to extend its Critical Illness (CI) policy. It currently offers CI policies covering the core conditions of:

- Heart Attack
- Stroke
- Coronary Artery Bypass
- Transplant
- Paraplegia
- Cancer Stage 4 (The stage of a cancer is a numerical description (from 1 to 4) of the severity of the extent of spread of the cancer, with 4 the most severe)

Additional benefits are being considered for an extended CI policy, including Cancer Stages 2 and 3, Alzheimer's Disease and a children's benefit for transplants and cancer.

- (a) What data sources can be used for pricing the extended CI policy?
(3)
- (b) Discuss the approach that would be taken to pricing the extended benefits and suggest what further policy design and risk management features can be used to reduce the cost of the extended benefits.
(6)

PLEASE TURN OVER

- (c) The insurer is considering reinsuring the extended CI policy. Discuss the merits of a quota share versus an excess of loss reinsurance arrangement. (6)
- (d) The insurer has proposed marketing the product to the existing policyholder base via an SMS campaign. Discuss this proposal. (3)

(18 marks)

QUESTION 5

A composite insurer writes individual income protection policies on an annually renewable basis. It takes up to four months for lapses to be processed. You are provided with the information that 43% of lapses are processed in the month to which they apply, 72% by the end of the following month, 94% by the end of the next month and 100% by the end of the final processing month.

It is the beginning of June, and an analysis of lapses for the previous nine months has just been carried out. The number of renewals invited for each month and the cumulative resultant lapses processed to date are as follows:

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Renewals invited	1658	1783	1824	1432	1921	1648	1683	1706	1692
Lapses	332	357	347	243	327	478	475	368	240

- (a) Calculate the expected lapse rates for each of the nine renewal months. (4)
- (b) Using the data above calculate the total number of lapses actually processed in May. (2)
- (c) Suggest reasons that could have contributed to the observed trend in experience. (4)
- (d) Discuss how the observed experience would affect the reserving basis and what further investigations will be required. (5)

(15 marks)

PLEASE TURN OVER

QUESTION 6

- (a) You are given the following information about the experience of a hospital insurance plan:

(OCR = outstanding claims reserve)

	R'000
OCR at 31 Dec 2008	15 643
OCR at 31 Dec 2009	20 367
Total claims paid in 2009 (all periods)	146 543
Claims paid in 2009 iro prior periods	14 867
Premium earned in 2009	167 038

- (i) Comment on the level of the gross loss ratio for 2009. (3)
- (ii) Comment in the change in the OCR from 31 Dec 2008 to 31 Dec 2009 (2)

(b) In the country in which you operate, there are currently two legal environments in which hospital insurance plans are sold. In the 'not-for-profit' environment, members own the funds, there are no brokers, contributions may not be age-rated and there is no underwriting. Solvency is set at 20% of contributions.

In the 'for-profit' environment, listed insurers provide the products on a risk-rated basis and brokers receive 10% commission annually. Solvency is set at 30% of premiums.

A reporter provides evidence that the contribution rates for hospital plans are lower in the 'for-profit' environment. She states that this confirms that the 'for-profit' environment is more efficient.

Discuss the reporter's interpretation of her findings. (10)

(15 marks)

END OF PAPER