

INSTITUTE AND FACULTY OF ACTUARIES



EXAMINATION

7 October 2015 (pm)

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 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 six 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.

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.

- 1**
- (i) State the purpose of an individual private medical insurance (PMI) policy. [1]
 - (ii) Outline the benefits that a standard individual PMI policy might cover. [4]
 - (iii) Describe the main features of a waiting list plan. [2]

A health insurer which currently sells PMI and waiting list plans has decided to stop selling waiting list plans.

- (iv) Suggest possible reasons for this decision. [8]
- [Total 15]

- 2**
- A health insurer sells income protection and critical illness insurance business through tied agents and independent insurance intermediaries.

It has been several years since the last full expense analysis was carried out and the insurer has simply been adjusting its expense assumptions each year using a price inflation index.

- (i) Suggest reasons why this may not be a suitable approach for the insurer to take. [10]
 - (ii) Describe the risks to the insurer if it continues to adjust the expense assumptions in this way. [11]
- [Total 21]

- 3**
- (i) Describe the following in the context of regular premium long term health insurance business:

- (a) indemnity commission
- (b) commission clawback
- (c) level commission
- (d) renewal commission

[8]

- (ii) Explain why indemnity commission may be more attractive to a distributor than level commission. [3]

A long term health insurer uses cash flow projection techniques to calculate its supervisory reserves.

- (iii) Outline, for each of the four commission-related cash flows listed in part (i), the approach that is typically used to allow for that cash flow in the calculation of supervisory reserves. [4]
- [Total 15]

- 4** A health insurer is considering launching a simplified individual accelerated critical illness insurance product.

The product will pay a lump sum only on diagnosis of one of the three following illnesses:

- heart attack
- cancer
- stroke

or on earlier death.

Initial investigations suggest that the price of the product will be only 5% lower than the price of the insurer's full individual accelerated critical illness insurance product, which covers 29 critical illnesses.

- (i) Suggest possible reasons why the price difference is small. [6]
- (ii) Discuss the marketability of the simplified product. [6]
- [Total 12]

- 5** A health and care insurer has been writing on average 1,000 fixed benefit pre-funded long term care insurance (LTCI) contracts each year.

The insurer has developed its own model for estimating future LTCI morbidity rates in order to set morbidity assumptions for pricing.

- (i) Define the following in the context of setting morbidity assumptions:
- (a) model risk
 - (b) parameter risk
 - (c) random fluctuations risk
- [3]
- (ii) Describe ways in which the insurer may be exposed to model and parameter risk with regard to the morbidity assumptions. [14]
- (iii) Explain how the insurer would be exposed to random fluctuations risk with regard to the morbidity assumptions. [3]
- [Total 20]

6 (i) Define the following terms in relation to income protection (IP) insurance:

- (a) deferred period
- (b) replacement ratio
- (c) unemployment benefit
- (d) proportionate benefit
- (e) rehabilitation benefit

[5]

A health insurer writes an individual IP product with the following features:

- The policyholder selects a benefit level and is charged a premium for that level of cover.
- There is no deferred period.
- Payment is made if the policyholder is unable to carry out his or her own occupation.
- The benefit is payable monthly.
- On each annual policy anniversary, the benefit level is increased by 5%. Benefit increases do not take place if the policy is in claim or if a claim has been notified.
- Claim payments normally start from the date of incapacity.
- Potential claims must be notified within one month of the date of incapacity. If a claim is notified more than one month after incapacity, the date of incapacity (and thus the date at which claim payments start) will be adjusted to be the date on which the claim is notified.
- The maximum net replacement ratio is 60%, taking State incapacity benefits into account.
- Proportionate and rehabilitation benefits are allowed. These assume that State incapacity benefits cease on return to work.

The insurer has provided the following information on three claimants under this product:

	Ms A	Mr B	Ms C
Date on which the policy commenced	01/01/2012	01/06/2012	01/01/2011
Original benefit level selected (amount per month)	300	200	500
Date of incapacity	01/02/2013	01/02/2013	25/01/2013
Date of notification	10/02/2013	28/02/2013	01/04/2013
Net salary prior to incapacity (amount per month)	600	300	400
State incapacity benefit (amount per month)	Nil	50	50
Data from which State incapacity benefit is paid	N/A	01/06/2013	01/05/2013
Date of return to work	01/06/2015	-	01/06/2014
Net salary on return to work (amount per month)	300	-	300
Date of full recovery	-	-	01/06/2015

It can be assumed that there were no other periods of incapacity for these policyholders prior to those noted in the table.

Ms A and Mr B have not yet fully recovered, although Ms A has returned to work.

- (ii) Determine the levels of monthly payments made to each of these claimants, stating the dates between which each level of payment is made. [12]
[Total 17]

END OF PAPER