

Actuarial Society of South Africa

EXAMINATION

9 JUNE 2021

Subject F101 – Health and Care

Fellowship Principles

Time allowed: Three hours and fifteen minutes, plus an additional five minutes to allow for scrolling in the ASSA Exam Platform

Total marks: 100

INSTRUCTIONS TO THE CANDIDATE

1. *Ensure that you are logged in and authenticated through Examity before you attempt the examination.*
2. *Questions are only available in the ASSA Exam Platform and may not be printed.*
3. *Submit all of your answers in the ASSA Exam Platform only. No uploads of answers (handwritten or otherwise) to the ASSA Exam Platform will be accepted.*
4. *You may not use any other computer program (e.g. Email, MS Word or Excel) or files, nor open any other browser during the examination.*
5. *You may not make use of a Formulae and Tables book during the examination. Any such information that may be required will be provided to you within the examination.*
6. *You are strongly encouraged to use the first 15 minutes as reading time only, however, you may commence answering the paper whenever you are ready.*
7. *Mark allocations are shown in brackets.*
8. *Attempt all seven (7) questions.*
9. *Show calculations where this is appropriate. You may use blank paper to carry out rough work calculations. You may use a calculator from the approved list only.*
10. *You may return to your answers to review and amend during the allotted examination time. Once you are happy with your answers you need to **Finish all and Submit** your work. Once you have submitted you will not be able to make any more changes to your answers.*
11. *You must submit all work BEFORE the end of the allotted examination time. Take this into account when planning your review and submission. There will be no time announcements.*

Note: Answers will be saved automatically during the examination if you are connected to the ASSA Exam Platform. However, 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.

END OF INSTRUCTIONS

QUESTION 1

A small insurer wants to offer a Critical Illness (CI) benefit to an existing market. In order to create an effective marketing campaign, they are offering a product feature where a claim under a policy does not cause the policy to cease. After a successful claim, the policy is reinstated even if the amount paid under the original claim was 100% of the sum assured. It has been suggested that the policyholder can claim up to a maximum of 3 times (a maximum of 300% of the sum assured) on their CI benefit. Every other CI benefit offered in the market allows only one claim to a maximum of 100% of the sum assured before the benefit ceases.

Discuss the considerations the insurer would need to take into account before offering this product feature.

[Total 9]

QUESTION 2

RecoHealth is a health insurer selling PMI and CI cover to corporate clients. You have performed an experience analysis for the insurer which shows that the client base has an ageing workforce. RecoHealth has therefore decided to launch a long-term care product to the existing group client base.

- i. Identify needs that would be met by the long-term care insurance policy that would not be met by the existing health insurance policies. [2]
- ii. Explain the importance of the actuarial control cycle in the ongoing management of the long-term care product. [10]

[Total 12]

QUESTION 3

ABC is a health insurer and is considering introducing a new premium rating factor into its individual PMI product. ABC would be the first insurer in the market to introduce this new factor rating. Some data related to the new factor has been collected at the claim stage but never used in pricing.

- i. Describe how you would use ABC's existing data to determine whether or not this new premium rating factor should be used. [6]
- ii. Explain what the potential risks are for ABC if they decide to include this new premium rating factor. [6]

[Total 12]

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QUESTION 4

The country of Actuarialia has an established market of health insurance products that offers annually renewable medical expense products that cover both in-hospital and out-of-hospital benefits.

Actuarialia's Health Insurance Regulator has implemented a new law requiring any health insurer to provide indemnity cover for a pre-defined list of diseases and procedures without any limitation. Active Health Insurers has decided to convert their book of Major Medical Expenses policies to full PMI cover. You have been asked to conduct a product review and pricing exercise.

Describe the issues that you would need to consider. Your answer should reference the impact on both the insurer and policyholders.

[Total 13]

QUESTION 5

A large PMI insurer with a strong solvency level has seen a gradual, steady decline in their level of solvency capital cover over the past five years.

- i. Outline possible reasons for this decline in the insurer's solvency ratio. [6]
- ii. Describe the investigations you might perform to analyse the observed trend in the solvency level. [12]

[Total 18]

QUESTION 6

A large health and care insurer is considering launching a new individual stand-alone critical illness product with a 28-day survival period. You are the pricing actuary tasked with setting the premium rates for this new product.

- i. State the general formula you would use to determine the risk premium for this product, defining all notation used. [2]
- ii. Discuss briefly the impact of the survival period on the expected claims from this product over time. [2]
- iii. List the key data items you would require to price this product. [4]
- iv. Outline the key risks to the insurer associated with the launch of this product. [8]

[Total 16]

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QUESTION 7

You are working as part of an actuarial team responsible for pricing for TopHealth, a PMI insurer. You are assisting the senior actuary with pricing for 2021.

You have been told that CPI over the past three years has been relatively flat at around 4.0%, and that it is not expected to change going into 2021. You have also been given the following information:

	Total annual claims	Average policyholders per month	Average number of months a policy is in force over the year	Average claim per policyholder per month
2018	R99.5 million	15,000	11.2	?
2019	R103.8 million	15,200	10.9	R626.51
2020	R113.5 million	15,140	11.0	?

Additional assumptions for loadings as percentage of gross premium for 2021:

Expense loading = 5.0%

Reserve loading = 2.0%

Profit margin = 1.5%

- i. The senior actuary has advised that the average growth rate in claims for the prior two years should be used to project the increase in claims for 2021. Calculate the average claim per policyholder per month growth rate that should be used for calculating the burning cost premium (BCP). [3]
- ii. A recent claims report showed that in 2019 there was an unusually large claim of R2.5million. Outline how you would adjust for this large claim and calculate the new claim projection for 2021 after adjusting for this large claim. [3]
- iii. Calculate the final proposed monthly premium per policyholder for 2021. [2]

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One of your colleagues has been doing a competitor analysis. She presents you with the following information on PMI insurer ImpiloMed which offers similar benefits to TopHealth.

Average cost per claimant for 2020	Proportion of policyholders claiming	Average policyholders per month	Average number of months a policy is in force over the year
R845	75%	21,800	11.2

Claims increase for ImpiloMed for 2019 = 4.5%

Claims increase for ImpiloMed for 2020 = 4.8%

Claims increase for ImpiloMed for 2021 = 5.3%

- iv. Calculate the expected claim cost for insurer ImpiloMed for 2021, and comment on how this compares to the adjusted claim provision you calculated for TopHealth. [2]

The senior actuary is concerned that claims increases for TopHealth are too high year on year. She has asked you to look into what can be done to better manage the claims costs and control the claims increases into the next few years, bearing in mind that the Board of TopHealth is unlikely to approve introducing any new benefit limits, exclusions, co-payments or deductibles.

- v. Comment on why the senior actuary has this concern. [4]

- vi. Discuss what feedback you would give the senior actuary to address this concern. [6]

[Total 20]

END OF EXAMINATION