



EXAMINATION

7 June 2023 (am)

Subject F101 — *Health and Care* Fellowship Principles

Time allowed: Three hours and twenty minutes (which includes five minutes for downloading and uploading your answer document)

Total marks: 100

INSTRUCTIONS TO THE CANDIDATE

1. Ensure that you are logged in and authenticated through Examity before you attempt the examination.
2. The question paper is only available in the ASSA Exam Platform as a PDF download and may not be printed. Copy/paste of questions or parts thereof is allowed from the question paper to your Word answer document only.
3. Download the Word answer document template from the ASSA Exam Platform. Save this Word answer document on your desktop using your Candidate Number as filename. You are required to submit your answers in Word format ONLY using this document. No answers in any other format (e.g. handwritten) will be accepted. Save work regularly.
4. Ensure that your Candidate Number appears in the “header” of your Word answer document. [Double-click on the header at the top of the Word document, input your Candidate Number only in the header, then press “Esc” to close the header.] **Do not use your name or member number anywhere in your Word answer document.**
5. You may not access any file from your computer, use any other computer program (e.g., Email or Excel), or open any other browser during the examination.
6. You may not use any other material (e.g., a Formulae and Tables book) during the examination. Any such information that may be required will be provided to you within the examination.
7. You are strongly encouraged to use the first 15 minutes as reading time only, however, you may start answering the paper whenever you are ready.
8. Mark allocations are shown in brackets.
9. Attempt all eight (8) questions, starting each on a new page (as provided for in the Word answer document).
10. Show calculations where appropriate. You may use blank paper to carry out rough work calculations. You may use a calculator from the approved list only.
11. Upload your Word answer document only into the ASSA Exam Platform. Once you have uploaded your document, you must click on **Finish Attempt** to save your document. You will still be allowed to go back and make changes (**Review Attempt**) if you have time.
12. Once you are satisfied with your uploaded document, click **Finish Attempt** and **Finish all and Submit**. Once you have submitted you will not be able to make any changes.
13. **You must submit your Word answer document BEFORE the end of the allotted examination time.** You should stop writing and start uploading during the last five minutes. Take this into account when planning your review and submission. There will be no time announcements.

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.

END OF INSTRUCTIONS

QUESTION 1

You are a pricing actuary for a health insurer and have been asked to evaluate the impact of medical advances on the experience of the insurer's without-profits critical illness book.

- i. Explain how improvements in diagnostic technologies might impact your valuations. [3]
 - ii. Describe five ways in which you might adapt your product design to account for this. [5]
- [Total 8]

QUESTION 2

- i. Describe the three main types of excess of loss (XoL) reinsurance. [3]

An insurer writing PMI business has a large book of in-force business and is concerned about claims volatility and the impact of this volatility on its solvency position given the recent pandemic and long-term effects of COVID-19. They have approached a reinsurer for assistance.

- ii. Outline how appropriate each of the three types of XoL reinsurance is for addressing the insurer's concerns. [3]

To improve the solvency position of the insurer, the reinsurer is willing to offer a contingent loan.

- iii. Define a 'contingent loan' and explain how it could improve the solvency position of the insurer. [3]
- [Total 9]

PLEASE TURN OVER

QUESTION 3

You are an actuary working for an insurer selling long-term care insurance (LTCI) policies.

- i. Describe various benefit design features of LTCI products that can assist the insurer with managing the claims risk associated with these products and how they may impact marketability.

[5]

The insurer has calculated the following capital requirements for its key risks:

- Morbidity risk = R150m
- Withdrawal risk = R15m
- Expense risk = R10m

The aggregated statutory capital requirement references the following correlations:

Risk	Morbidity	Withdrawal	Expense
Morbidity	1	0.2	0.5
Withdrawal	0.2	1	0.3
Expense	0.5	0.3	1

- ii. Calculate the aggregate capital requirement. [3]
- iii. Explain why the result is less than the sum of the individual risks. [1]
- iv. Outline the implications for a health insurer holding higher reserves than the statutory minimum requirements. [3]
- v. Explain why the insurer may be holding higher reserves than the statutory minimum. [3]

[Total 15]

PLEASE TURN OVER

QUESTION 4

A health insurer has entered into an agreement with a hospital group for a risk-share in respect of the hospital admission claims for 2022. The terms of the agreement are as follows:

- Claims paid on a fee-for-service basis during the year
- A cap of 7% on the risk-adjusted increase in claims costs over 2021
- If the claims experience exceeds the cap then the hospital is required to refund the difference
- If the claims experience is lower than the cap then the hospital will share in 50% of the savings

You have been provided with the following information regarding the overall claims experience:

	2021	2022
Cost per admission	R21 800	R23 900
Number of admissions per month	5 800	6 400
Case mix index	1.005	1.017

- i. Calculate the payment due either from or to the hospital group in respect of the 2022 experience.

[3]

The hospital has argued that trauma admissions should not be included in the agreement for 2023.

- ii. Comment on whether this is appropriate in the context of the purpose of the agreement.

[2]

You are provided with the following additional information relating to trauma admissions for 2021 and 2022.

	2021	2022
Cost per admission	R86 000	R92 880
Number of admissions per month	300	400
Case mix index	2.8	2.9

- iii. Calculate the adjusted case mix indices and adjusted costs per admission for the hospital group for 2021 and 2022 had the trauma cases been excluded.

[2]

- iv. Calculate how the amount calculated in (i) above would be affected by excluding the trauma claims and comment on this result.

[4]

[Total 11]

PLEASE TURN OVER

QUESTION 5

i. Define the following terms:

- a. Primary healthcare
- b. Secondary healthcare
- c. Tertiary healthcare

[3]

You are an actuary working for a health insurer developing a new health insurance product that specifically focuses on primary healthcare.

ii. List 8 potential benefits that could be included in this new product.

[4]

iii. Explain the various benefit design structures that could be used to clearly define the benefit entitlement in this new primary healthcare insurance product.

[3]

iv. Outline the key factors that you would consider when designing the benefit package for this new primary healthcare insurance product.

[5]

[Total 15]

QUESTION 6

A developing country has a well-funded, expensive private healthcare system which only covers a small proportion of the population. The government has introduced an incentive for the private sector to sell low-cost health insurance plans to extend access to private healthcare for a greater proportion of the population. The government has published a benefit structure, covering mainly primary care benefits, that these plans will be required to provide cover for.

i. List 4 incentives that the government could introduce to assist in achieving its aim.

[2]

ii. Describe the process an insurer would follow to determine a suitable price for such a plan.

[10]

[Total 12]

PLEASE TURN OVER

QUESTION 7

- i. Define 'Managed Care'

[1]

You work for an established Managed Care Organisation (MCO) and will be tendering to a large health insurer for a contract to provide their Managed Care interventions.

- ii. Identify four managed care interventions you can offer the insurer and explain how these will assist the insurer in managing its risk

[6]

A number of MCO's competitors are also tendering for the contract.

- iii. Describe ways in which MCO can increase their chances of being awarded the tender

[6]

[Total 13]

QUESTION 8

ABC is a newly established health insurance company in a country with a developing financial services industry. ABC is considering introducing an innovative standalone health product for high-cost care. This product provides indemnity cover for specific health-related claims for the insured lives covered under the policy for a pre-specified layer of cover. For example, the insured will be able to claim R500 000 sum insured only once they have incurred claims in excess of R1 000 000. The policyholder will be able to select from a range of cover layers and excess points at inception.

You are an actuary working for ABC and have been tasked to design and price this product. Describe how you would apply the actuarial control cycle to:

- i. Understand the rationale for the product and the general commercial and economic environment

[5]

- ii. Specify the problem

[3]

- iii. Develop the solution

[6]

- iv. Monitor experience

[2]

- v. Ensure professionalism

[1]

[Total 17]

[Grand total 100]

END OF PAPER