

# EXAMINATION

11 November 2025 (am)

## Subject F103 — General Insurance Fellowship Principles

Examination writing time: Three hours and fifteen minutes (includes reading time)

Upload time: Five minutes

[Total time on examination countdown timer: Three hours and twenty minutes]

Total marks: 100

### INSTRUCTIONS TO THE CANDIDATE

**Failure to adhere to any of these instructions could incur examination sanctions including disqualification from the examination.**

1. The question paper is only available on 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.
2. Download the Word answer document template from the ASSA Exam Platform. Save this Word answer document on your desktop using your **full Candidate Number**, which starts with "F103-exa-2025-...", as filename. **Do not name your answer script with your name or member number.**
3. Ensure that your **full 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.**
4. 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.
5. You may not access any file from your computer, use any other computer software (e.g., Email or Excel), or open or use any other browser, collaboration tools or AI tools, including those embedded in MS Word and Adobe AI assistant (e.g. Copilot, ChatGPT etc.) during the examination. Embedded AI tools must be disabled. You may not use Grammarly, Grammarly Premium or similar built-in language and grammar tools which must also be disabled. Microsoft Word spellcheck is allowed.
6. You must save your answer template to your local machine's desktop and have 'Autosave' switched off (top-left button in Word). You must not save your answer template to OneDrive or any other cloud storage device.
7. You are not permitted to bring any other material into the examination (e.g. a Formulae and Tables book). Any such information/material that may be required will be provided to you in the examination.
8. 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.
9. Mark allocations are shown in brackets.
10. Attempt all eight (8) questions, starting each on a new page (as provided for in the Word answer document).
11. Show calculations where appropriate. You may not use other materials except blank paper for calculations. You may use a calculator from the ASSA-approved list only.
12. Your examination countdown timer reflects your **TOTAL** examination time. Reading and writing time is 3 hours and 15 minutes. Audio prompts will remind you of the remaining writing time and when you should stop writing to start saving and uploading. **You may NOT continue to write during the 5 minutes upload time as this could lead to disqualification from the examination.**
13. Upload one version of your Word answer document only onto 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 check that you have uploaded the correct version of your answer script (**Review Attempt**) if you have time. Remember that you may not type answers in the last 5 minutes of upload time.
14. 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.
15. **You must submit your Word answer document BEFORE the time on your examination countdown timer runs out.**

**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. The onus remains on you to read and implement all examination instructions.**

**END OF INSTRUCTIONS**

## QUESTION 1

A general insurer writes commercial property insurance and has reinsurance treaties in place which operate in the order given below:

- 20% Quota Share; and
  - Surplus, which has the following conditions:
    - A maximum of 4 lines of cover;
    - A maximum retention limit of \$24m (based on Expected Maximum Loss (EML)); and
    - A minimum retention limit of \$5m (based on EML) for each risk reinsured under the surplus treaty.
- i. Determine, for a policy with Expected Maximum Loss (EML) of \$50 million on which there is a claim for \$75 million (which is below the Sum Insured), the maximum and minimum amounts which could be recovered from the surplus reinsurer. [4]
- ii. Determine, for a policy with EML of \$25 million on which there is a claim for \$10 million, the maximum and minimum amounts which could be recovered from the surplus reinsurer. [3]
- iii. Determine the number of lines of surplus cover which the insurer would need to use for a policy with Sum Insured \$150 million and EML \$90 million, in order to ensure that its maximum (net of reinsurance) claim payment would be \$30 million. [2]

The insurer is considering replacing the Surplus cover by Risk Excess of Loss.

- iv. Define what is meant by a “working layer” and state and outline briefly any type(s) of reinsurance commission which may be paid to a direct writer with a working layer cover. [2]
- v. State the smallest layer of Risk Excess of Loss cover the insurer would need to have in place to limit its maximum (net of reinsurance) claim to \$30 million on the policy described in (iii) above. [1]
- [Total 12]

## QUESTION 2

- i. Define the terms “risk” and “uncertainty” in the context of a general insurer. [1]

Cell4U is an insurer that sells only one type of policy – cell phone property insurance to individuals.

- ii. Discuss how risk relating to damage or loss of a cell phone may be viewed differently from the perspective of a prospective policyholder and the insurer, and hence explain why an insurance market between individuals and the insurer exists. [4]

**PLEASE TURN OVER**

- iii. Outline briefly the 2 main areas of uncertainty faced by the insurer. [2]
  - iv. Outline 3 sources of uncertainty related to future policyholders, and for each provide an example related to cell phone property insurance of how this uncertainty can translate into a risk for the insurer. [4]
- [Total 11]

### QUESTION 3

A large composite multi-national insurer is looking to build a new economic capital model that will run in parallel to its existing regulatory capital model.

- i. List 4 things that this model should account for in order to arrive at an economic capital amount. [2]
- ii. Explain why a stochastic model would be preferable to a deterministic one in modelling economic capital for this insurer. [4]

The insurer is considering investigating the use of machine learning in the economic capital model.

- iii. Comment on the appropriateness of using machine learning in order to arrive at an accurate economic capital amount. [3]
- [Total 9]

### QUESTION 4

TravelSure is a large local insurer specialising in single trip travel insurance.

- i. Describe the cover provided by travel insurance. [4]
- ii. Describe the liability characteristics for TravelSure and hence outline briefly suitable matching assets. [5]

A summary of TravelSure's recent key financial metrics is provided below:

	2022	2023	2024
Combined ratio	94%	95%	96%
Profit margin	11%	10%	6%
Return on capital	18%	18%	10%
Solvency margin	215%	235%	163%

- iii. Explain possible underlying causes for the trends evident in the table above. [5]
- [Total 14]

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## QUESTION 5

You are a pricing actuary for ABC Insurance, an established insurer that has been writing property insurance for many years. ABC has been investigating the introduction of a “parametric” property insurance policy. Under ‘parametric’ insurance, a claim payment is made if a pre-defined “trigger” event occurs (e.g. the amount of rainfall over a period exceeds a specified limit). If the pre-defined “trigger” event occurs, a specified payout is made regardless of the actual extent of damage or loss sustained.

- i. Explain possible reasons for ABC wanting to introduce “parametric” property insurance to the market. [2]
  - ii. Explain the key difference in pricing traditional property insurance compared to pricing “parametric” property insurance. [2]
  - iii. Describe how you would go about gathering and adjusting data for the purpose of determining risk premiums for the “parametric” insurance product. [6]
  - iv. Explain briefly how a frequency-severity approach can be used to derive risk premiums for the “parametric” insurance product. [3]
- [Total 13]

## QUESTION 6

ABC Insure writes various lines of business. It is reviewing the quality of past claims data held on its computer system for pricing and reserving.

- i. List possible sources of distortions or errors in past claims data apart from those arising from incorrect data capture. [4]
  - ii. Suggest, for each of the data capture errors listed below, automated checks that could be built into a computer system to help minimise the incidence of such errors:
    - a. Incorrect claim dates entered.
    - b. Incorrect payment dates entered.
    - c. Incorrect amounts entered.
    - d. Information entered onto the wrong claim record.[4]
  - iii. Explain possible consequences of erroneous claims data for ABC Insure, apart from incorrect premiums and reserves. [4]
- [Total 12]

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## QUESTION 7

You work for Covered, a local short-term insurer and market leader in both personal and commercial lines aviation insurance.

- i. List 4 liability-related perils covered by aviation insurance.

[1]

As a result of increased drone sales, Covered is looking to introduce a new drone insurance product that is designed to protect insureds against financial losses associated with the use of drones. It is planned to be sold under both personal and commercial lines.

- ii. Compare the proposed drone insurance with Covered's traditional aviation insurance under the following headings:
- a. Benefits of the products.
  - b. Exposure measure to which premiums relate.
  - c. Claim size characteristics.

[4]

Only a few other insurers in the local insurance market have launched similar drone insurance products. Covered is considering two initial distribution strategies for the drone product:

- A. Partnering with the largest drone seller (for retail markets and commercial farmers) in the country. At point of sale, customers are offered Covered drone insurance with the first month free following underwriting.
- B. Cross-selling, using in-house sales staff, to existing policyholders.

- iii. State which marketing strategies each of the strategies above are examples of.

[1]

- iv. Discuss the likely effectiveness of the proposed distribution strategies in the short term, and the medium term.

[4]

- v. Suggest, with reasons, which strategy should be adopted by Covered.

[1]

- vi. Define "exclusion" in the context of short-term insurance, and state a reason for its use.

[1]

Covered implemented strategy A six months ago. Analysis of claims data over this period has revealed a higher-than-expected loss ratio. The underwriting team thinks it may be due to anti-selection and moral hazard among first-time buyers of drones.

- vii. Explain three exclusions, specific to the drone insurance product, which could mitigate such issues in future policies.

[3]

[Total 15]

**PLEASE TURN OVER**

## QUESTION 8

You work for a well-established general insurance company. The company started writing commercial property and employers' liability insurance over 30 years ago and is a leading insurer in these lines of business. The company also writes smaller volumes of other lines of business. You are busy estimating the claim reserves as at 31 December 2024 on both a published and supervisory basis.

- i. Outline 3 accounting principles that should be considered when determining the claims reserve to be shown in the insurer's published accounts.

[3]

- ii. Outline 2 reasons why the claims reserves calculated on a published and supervisory basis may differ.

[2]

A summary of relevant premium and claims information, based on data you have collected so far in preparation for the reserving exercise, is given below:

Line	Claims and premium information
Commercial property	<ul style="list-style-type: none"> <li>The claims number triangle is not reliable.</li> <li>The mix of properties insured, and policy conditions have been consistent over the last 10 years.</li> <li>There were significant floods two years ago estimate at the 1 in 50 return period.</li> <li>This line of business is subject to large individual claims.</li> </ul>
Travel insurance	<ul style="list-style-type: none"> <li>Your company started selling this business three years ago and there is limited data available.</li> <li>Your underwriters have provided you with best estimate loss ratios, supplemented by a recent market analysis.</li> <li>Due to negative underwriting results premium rates were significantly increased, and higher excesses and limits were introduced in the last year.</li> </ul>
Employers' liability	<ul style="list-style-type: none"> <li>Due to the long-term nature of the claims, the claims data available for the two most recent accident years is somewhat limited.</li> <li>For older accident years i.e. three years or older, there is a reasonable volume of consistent claims data available.</li> <li>During the last two years your company hired three additional claims staff with a strong legal background. This is expected to speed up the processing of claims and reduce legal defence costs.</li> <li>Due to the release of case estimates there is negative incurred claims development for latter development years.</li> </ul>

- iii. Suggest, with reasons, which actuarial reserving methodologies are most suitable for the calculation of best estimate claims reserves for each of the lines of business above.

[5]

- iv. Suggest, for each of the above lines of business, any adjustments you would make to the data, proposed reserving methodologies or assumptions prior to estimating the claims reserves.

[4]

[Total 14]

**END OF PAPER**