

EXAMINATION

8 November 2024 (am)

Subject F103 — *General Insurance* 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

Failure to adhere to any of these instructions could incur examination sanctions.

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. Do not name your answer script with your name or member number.*
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. *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.*
6. *You may not access any file from your computer, use any other computer app (e.g., Email or Excel) or open any other browser during the examination. Nor may you use Grammarly, Grammarly Premium or similar add-ins. Microsoft Word spellcheck is allowed.*
7. *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.*
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 all calculations. You may use blank paper to carry out rough work calculations. You may use a calculator from the ASSA-approved list only.*
12. *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.*
13. *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.*
14. ***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

- i. State, and outline briefly, the 2 policy bases most commonly used in respect of non-proportional reinsurance. [2]
- ii. Outline the main risk faced by the insurer in switching the basis of its non-proportional reinsurance between those identified in (i). [1]
- iii. State, with justification, which type of basis presents the greater risk to the reinsurer when accepting new business. [1]

Company X, a general insurer specialising in commercial property insurance, has set up the following reinsurance arrangements, which operate in the order given below:

- 25% Quota Share, with Reinsurer A.
- Surplus, with Reinsurer B, which has the following conditions for each reinsured risk:
 - A maximum of 4 lines of cover;
 - A maximum retention limit of R100 million based on Expected Maximum Loss (EML).
- Risk Excess of Loss (XL), with Reinsurer C:
 - Covering 90% of losses in the layer R200 million in excess of R50 million.
 - The reinsurance premium for each policy on this element of the cover is set at 1% of the maximum potential recovery from Reinsurer C for that policy.
 - Profit commission payable by Reinsurer C at the end of the year based on the aggregate experience on the XL portfolio is 50% of (70% of the XL Reinsurance Premiums paid less the XL Reinsurance Recoveries), if positive otherwise nothing is payable.

You have been provided with the following information on the reinsured policies for the year:

Policies	Sum Insured	EML	Surplus Retention	Claim Amount	Reinsurance Premiums		
					Paid to A	Paid to B	Paid to C
1	R400m	R200m	maximum permitted	0	R1m	(a)	(b)
2	(d)	R400m	minimum permitted	R400m	R2m	(c)	R0.9m
Totals for all other policies	Not provided	Not provided	Not provided	Not provided	Not provided	R25m	R7.75m

- iv. Determine the amounts (a) – (d) in the above table. [6]
 - v. Determine the net profit/loss on the XL portion of the reinsurance arrangement for the year for Company X, assuming XL reinsurance recoveries totalled R5 million. (Ignore expenses and investment returns). [2]
- [Total 12]

PLEASE TURN OVER

QUESTION 2

- i. State reasons for the potential lack of sufficient adequate data in the general insurance area.

[2]

Company X, a general insurer, writes various lines of general insurance business. Company X will soon replace their old computer system with a new system for policy and claims administration.

- ii. List 7 internal parties that should be represented on the development team for this new system and provide a reason for consulting each on the claims and/or premiums administration migration specifically.

[7]

- iii. Identify 2 external parties that could be involved in the system migration process, and state how they could be involved.

[2]

[Total 11]

QUESTION 3

- i. Describe briefly the following three core features of capital models: “risk profile”, “risk measure” and “risk tolerance”.

[3]

The National Insurance Regulator (NIR) has recently issued a guidance note for short-term insurers regarding the integration of climate risk into existing capital models used for regulatory reporting. The guidance specifies that insurers must incorporate all potential climate change impacts on additional capital reserves. The guidance aims to ensure that insurers demonstrate adequate additional capital reserves such that they will only reach a point of insolvency, due to losses caused by climate change, if they experience a 1-in-500 year adverse climate event within a two-year time horizon.

- ii. Explain, by referring to the core features described in (i), how the above guidance might affect an insurer’s existing capital model.

[3]

The NIR expects insurers to incorporate the guidance in their next regulatory report due within the next 12 months. Given the limited time for implementing the guidance, the NIR has stated that “For the next regulatory report due, insurers need only model the most significant and direct impacts of climate change on the insurance risk component of their additional capital reserves. The most material risks to the insurer should be accounted for.”

- iii. In the context of capital modelling, define the principles “proportionality” and “practicability”.

[1]

- iv. Explain how the principles of proportionality and practicability can be applied by an insurer writing mainly residential property insurance, mobile phone insurance and a small amount of crop insurance, in order to meet the regulator’s requirements.

[3]

[Total 10]

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QUESTION 4

You are a pricing actuary for a local reinsurer which is part of a large international reinsurance group. You have just received a tender from ECap which is a captive insurance company fully owned by ENat, the largest producer of electricity in the country. ECap is looking to set up an excess of loss reinsurance arrangement on some of the property damage policies it has with ENat.

- i. Explain what a “captive insurer” is and outline the reasons why ENat may have set up ECap. [4]
- ii. List 8 rating factors that could be used by ECap to determine the risk premium for property damage for ENat. [4]
- iii. Outline briefly the factors that need to be considered before the reinsurer agrees to quote for the business. [7]

[Total 15]

QUESTION 5

A nuclear power company is reviewing its insurance arrangements. All the power plants it is involved with have been designed and built by the company. It also supplies the key personnel needed to run these power plants, which are located in several countries. It is, however, not involved in the transporting or disposing of related hazardous nuclear material.

- i. Outline, with reasons 3 property, 3 liability and 3 financial loss insurance products relevant to the nuclear power company. [9]

The company has a large amount of property exposure that it doesn't believe requires 100% insurance coverage.

- ii. Explain how the principle of a first loss basis, and using the estimated maximum loss as an exposure measure as opposed to the entire market value of the property, can result in more affordable insurance. [2]
- iii. Comment on whether you believe a first loss basis is appropriate for the company. [1]

[Total 12]

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QUESTION 6

- i. Define the concept of a risk pool as it applies to Protection & Indemnity (P&I) Clubs. [2]
 - ii. Describe what a “Lloyd’s syndicate” is and how it is formed in order to provide insurance. [5]
 - iii. Outline the circumstances under which each of a P&I Club or a Lloyd’s syndicate would be preferable for insuring an international shipping company. [3]
- [Total 10]

QUESTION 7

- i. List 4 examples of regulatory restrictions on an insurer’s investments, and for each one give a possible rationale for the restriction. [4]

An extract of the financial results of XYZ, a local insurer specialising in marine, aviation and transport insurance (MAT), is summarised below.

P&L Account (R millions)	
	2023
Premiums earned	250
Claims incurred	200
Post-tax profit	25

Balance Sheet (R millions)		
	Dec 2022	Dec 2023
Total assets	550	610
Total liabilities	450	500

- ii. Calculate the following ratios for XYZ for 2023:
 - a. Loss ratio.
 - b. Profit margin.
 - c. Return on capital employed.

[3]

XYZ’s assets are all invested in local cash deposits and money-market instruments.

- iii. Outline MAT insurance liability characteristics and hence discuss the suitability of XYZ’s investments. [5]

A significant number of policies are sold to MAT companies based in a neighbouring country, Landia. Landia’s government recently proposed that insurers selling policies in Landia must invest sufficient funds, that cover all liabilities in respect of those policies, in money market instruments issued by Landia’s government in Landia currency.

- iv. Outline briefly the potential impacts of the proposal on XYZ’s investment strategy. [3]

[Total 15]

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QUESTION 8

The company you work for started selling insurance 20 years ago in a developed market and writes primarily personal motor business with some property and liability business. Over the last 3 years, due to competitive pressure in the motor insurance industry, the company has focused on writing more liability business which is currently a profitable sector. The company has recently acquired two brokers who specialise in selling liability insurance.

You are performing the IBNR calculation as at 31 December 2023. The company uses the Basic Chain Ladder method applied to the incurred claims triangle which contains combined data for all classes of business.

- i. Outline 3 key requirements that should be met before the Basic Chain Ladder method can be used.

[3]

- ii. Discuss 2 advantages and 2 disadvantages of the company's approach of using combined data for deriving the IBNR.

[4]

Given an increase in liability business you have decided to perform a separate calculation of the IBNR for the liability business. Your approach for this business consists of a blend between the Loss Ratio and the Average Cost Per Claim methods where each method is given equal weight. You have been provided with the following information for the liability business:

Accident Year	Gross Earned Premium (R millions)	Initial Expected Loss Ratio	No. of claims reported by end of 2023	Average cost per claim (R)
2022	200	55%	1 000	50 000
2023	300	60%	500	55 000

Your broker has provided you with the following market statistics on the development of the number of reported liability claims:

Delay in years	1	2	3	4	5
Percentage of claims reported (by number)	20%	40%	60%	80%	95%

- iii. Calculate the IBNR for the liability business for the 2022 and 2023 accident years.

[6]

- iv. Explain whether the suggested approach is likely to provide a more accurate IBNR for the liability business than produced by the previous approach.

[2]

[Total 15]

END OF PAPER