



## EXAMINATION

9 June 2023 (am)

### Subject F104 — Retirement and Related Benefits 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

Outline the factors that trustees should consider when designing an investment strategy for a final salary defined benefit fund.

[7]

### QUESTION 2

Describe the 3 (three) stages of the demographic transition.

[8]

### QUESTION 3

- i. Provide the formulae for the actuarial liability in a final salary defined benefit fund for both the current unit and projected unit methods and show the relationship between the PUAL and CUAL. Define all notation used.
- ii. An actuarial student remarks that a higher actuarial liability means a lower standard contribution rate. Comment on whether this is true for comparing the CUSCR and PUSCR.

[5]

[3]

[Total 8]

### QUESTION 4

The management board of a large corporation is considering introducing a “work-from-home” policy in respect of certain types of employees where staff may work remotely on most days.

- i. Outline 5 (five) reasons why this employer might spend time and effort designing the “work-from-home” policy to suit the needs of their staff.
- ii. Outline the risks to the employer of allowing some staff members to work from home.

[5]

[6]

[Total 11]

**PLEASE TURN OVER**

## QUESTION 5

An employer is sponsor to a final salary defined benefit pension fund with the normal retirement age set at 65. The employer is considering introducing the option for employees to retire early, any time from the age of 60, without application of a penalty for early retirement. The employer has asked you to draft a valuation report indicating what the effect would be on the fund's solvency level if the change were implemented immediately.

- i. Outline the main factors to consider in setting the valuation basis for this exercise and the retirement decrement assumption in particular.

[4]

- ii. Briefly describe some of the other factors you would consider when drawing up the report.

[4]

The results of the valuation indicate that a deficit would emerge if the early retirement option under consideration is implemented. The employer is considering whether to finance the deficit via an immediate lump sum contribution, equal in value to the shortfall arising, or alternatively establishing a liability in the employer accounts to reflect the deficit.

- iii. Provide formal names for and outline how each financing mechanism would work.

[4]

[Total 12]

**PLEASE TURN OVER**

## QUESTION 6

Your friend, who is a self-employed medical doctor, has approached you for advice as an actuarial student studying pensions and related benefits.

- i. Outline the professional and regulatory issues would you need to consider before giving your friend advice.

[4]

The government in the country where you live wants to introduce a national, contributory fund (called the 'NCF') where every employed person in the country would be auto-enrolled. The NCF also has a death benefit.

- ii. Define auto-enrolment

[1]

Your friend has a voluntary, contributory defined contribution retirement savings vehicle that she purchased as an individual. Your friend also has an individual term assurance policy and is weighing up whether she should opt out of the NCF.

- iii. Outline the elements of fund design that your friend should compare and contrast between the NCF and her existing arrangement before she makes a decision on opting-out.

[9]

[Total 14]

## QUESTION 7

The retirees of a large defined contribution fund are defaulted into a level single-life guaranteed annuity provided by a specific external insurance company, unless they opt out of this arrangement. By regulation, no cash benefit is allowed at retirement and so the full retirement benefit will be used to purchase the annuity.

- i. Assess the appropriateness of the default annuity arrangement.

[4]

The fund performs benefits projections each year to give members an indication of their likely income replacement ratios at retirement. The current projection levels show an overall increase in income replacement ratios across the membership.

- ii. Identify and explain items of experience that might have contributed to this change.

[8]

The assets of the fund are currently invested according to a life-stage model. Assets are progressively switched from more aggressive investments, such as equity and property, into nominal government bonds and cash as members draw closer to retirement.

- iii. Briefly evaluate the suitability of the current investment strategy.

[7]

[Total 19]

## QUESTION 8

In the country of Gaul, the Gaul government runs a mandatory, contributory defined contribution retirement arrangement called Gaul4U. All employed people in Gaul are required to pay a contribution into the fund for each month that they work. At retirement, which can occur at any age over 60, the member's full fund credit is converted into an in-fund inflation-linked life annuity, using unisex age-dependent rates and a spouse's reversion. The conversion rates are updated annually and published 6 months before implementation.

- i. Explain the longevity risks faced by Gaul4U and how they might arise. [4]
- ii. Explain why the Gaul government may have gone ahead with providing Gaul4U despite the risks involved. [8]

Actuaries perform an annual valuation for the purposes of monitoring the liability in respect of the pensioner members. The government is now considering a buy-out of this liability for current pensioners and has asked you, as an experienced pensions actuary, to perform a valuation for this purpose.

- iii. Explain how your valuation may differ from the regular annual valuation. [4]
- iv. Outline how Gaul4U, its members and the government may be affected by a buy-out of the current pensioners. [5]

[Total 21]

**END OF PAPER**