



EXAMINATION

3 November 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 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.
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 seven (7) 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

The state of a developed country provides a universal (not means-tested) low-level basic monthly grant to all citizens over the age of 63. In addition, the country has a well-developed private retirement savings industry which uses defined benefit funds exclusively. The country has a stable population pyramid and the social security benefits are funded from tax income.

- i. Describe what a stable population pyramid looks like and what this shape indicates. [1]

Due to a recent medical advancement, the life expectancy at age 63 is expected to immediately increase by 2 years. You may assume mortality at other ages is unaffected.

- ii. Outline the implications of such a shock to mortality on benefit provision.

[6]

[Total 7]

QUESTION 2

A defined benefit fund provides pension benefits directly from the fund. Every member of the fund who is married at the date of retirement, must take a spouse's reversionary annuity. When the member passes away, any surviving spouse at the date of their death is entitled to a pension for the rest of their life. Married members require no documentation to be submitted at retirement stage. Members need to prove they are not married in order to obtain a single life annuity. You may assume in this scenario that only one legal spouse is possible.

- i. List the assumptions the fund needs to make about the spouse to estimate the joint-life annuity value. [2]

A trustee states that getting married members to submit their spouse's details at retirement date would reduce the longevity risk substantially.

- ii. Briefly outline the benefit design changes the fund could make as a result of having this additional information. [2]
- iii. Comment on the trustee's statement.

[4]

[Total 8]

PLEASE TURN OVER

QUESTION 3

You have recently performed the valuation for a pensioner-only defined benefit fund that has been closed to new members since before the last valuation. The trustees of the fund are uncomfortable with the level of investment risk associated with the fund. They have asked you to provide advice on a more appropriate investment strategy.

- i. Describe the process you would follow to construct an asset-liability model, and how the model can be used to determine an appropriate strategy for the fund.

[6]

The modelling process reveals that investing primarily in a combination of domestic nominal and inflation linked bonds, with some cash exposure, is most appropriate.

- ii. Outline how the trustees and sponsor might react to this investment proposal.

[7]

[Total 13]

QUESTION 4

You are performing the regulatory valuation for an employer-sponsored defined benefit scheme in a country that is recovering from a recession. The economic environment is characterised by low interest rates and rapidly rising inflation. As a result of the recession, the employer has recently implemented a series of forced exit (retrenchment) exercises.

- i. Describe the membership data checks that you would carry out when carrying out the valuation.

[4]

- ii. Discuss the factors that you would consider when setting the economic assumptions for the valuation.

[6]

The valuation results show that a deficit has emerged over the period since the previous valuation.

- iii. Comment briefly on how economic and demographic factors, excluding any changes to the valuation basis, would have contributed to a change in the fund's financial position since the previous valuation.

[4]

- iv. Explain the process you would follow to determine the impact of forced exits on the fund's financial position.

[5]

[Total 19]

PLEASE TURN OVER

QUESTION 5

BigCo is a large multinational organisation. They have recently decided to expand operations to a new territory, Hafna, and are making plans for establishing SubCo, their first company in Hafna.

- i. Outline the reasons why BigCo may choose to include different types of benefits in their employees' remuneration packages in SubCo as opposed to paying only cash. [9]

After much deliberation, it is decided that SubCo should have a final salary retirement fund. BigCo itself has a final salary retirement fund.

- ii. Outline why the design of SubCo's fund may differ from that of BigCo's and for each reason suggest design elements that may need to be adjusted for that reason. [8]

Regulation in Hafna allows for employers to use terminal funding of their benefit schemes.

- iii. Define terminal funding. [1]
- iv. Describe what some of the advantages may be for SubCo using terminal funding as opposed to regular contributions. [5]

[Total 23]

PLEASE TURN OVER

QUESTION 6

- i. In general terms, the Attained Age Actuarial Liability (AAAL) can be expressed as a formula which is a function of the contribution rate. Express this formula in words. [2]

You assist the actuary to an employer-sponsored, defined contribution fund. The board of trustees targets an income replacement ratio of 75% for members that retire at the age of 65. The actuary has been requested to evaluate whether members are “on-track” to reach this target by comparing the level of accumulated assets to the liability implied by the target.

The actuary has requested that you complete the calculations by applying the Attained Age Funding Method and using the fixed contribution (C) rate as defined in the rules of the fund.

- ii. Express the AAAL for this fund as a mathematical formula defining all symbols used. [4]
- iii. Outline two (2) reasons why the actuary has advised you to apply the Attained Age Funding Methodology for this calculation. [2]

Your calculations indicate that, on average, members are falling short of meeting the targeted replacement ratio.

- iv. Describe the main risk factors in a defined contribution fund that might result in failure to meet income replacement ratio targets. For each risk factor suggest how the risk can be mitigated. [6]
- [Total 14]

PLEASE TURN OVER

QUESTION 7

- i. Define the two major types of product standards that may be applied in product regulation, giving an example of each. [3]
- ii. List four distinct sub-optimal behaviours often demonstrated by members when faced with investment choice in a benefit fund. [2]

Regulations require that any defined contribution retirement fund that offers member investment choice must have a default investment strategy. The trustees of a large defined contribution fund that individuals can join voluntarily have had the same default strategy for several years managed by the same investment manager. They are now reviewing their defaults.

- iii. Outline, with reasons, the factors that the trustees would consider when reviewing their choice of default and implementing any changes.

[11]

[Total 16]

END OF PAPER