ACTUARIAL SOCIETY OF SOUTH AFRICA

EXAMINATION

20 October 2023 (am)

Subject F204 — Retirement and Related Benefits Fellowship Applications

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. The use of Grammarly and Grammarly Premium or similar is also not permitted in examinations.*

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 questions.*

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 must 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 the actuary advising a large defined contribution pension fund on its default annuity strategy.

The trustees of the fund are particularly interested in including a living annuity option in the default strategy, as they believe this will remove their ongoing burden of responsibility towards members who retire from the fund. You are concerned that they are disregarding the risks inherent to living annuities that annuitants will be exposed to.

i. Briefly outline the context that has led to the trustees being required to establish a default annuity strategy. [5]

ii. Discuss the features of a living annuity that make it attractive to retirees. [4]

The Financial Sector Conduct Authority (FSCA) has issued specific criteria for including living annuities in an annuity strategy.

iii. Discuss the major risks of living annuities to annuitants which are addressed by these criteria and briefly outline the conditions that must be met for a living annuity to be chosen as part of the fund's default annuity strategy. [10]

The curve below shows the projected levels of capital in a living annuity for an individual for his retired lifetime.

iv. Discuss the shape of the curve. [3]

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The pension fund has a normal retirement age of 65. As part of your advice on the default annuity strategy, you have suggested the trustees implement maximum drawdown rates of 4.5% for males and 4% for females retiring at 65. The trustees are concerned that these rates will result in levels of income that are not sufficient for a pensioner to live on.

They have suggested the maximums be set at the drawdown limits established by the FSCA. The rates would then be 5.5% for males and 5% for females.

v. Discuss the trustees' suggestion in the light of the impact on retirees and the sustainability of the fund to provide these levels of income. Include a comparison of the number of years the capital would be expected to last for a retiring male under the two drawdown scenarios, assuming an annual inflationary increase in income. You do not need to include detailed calculations, but state any assumptions you make.

[8]

[Total 30]

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QUESTION 2

Fund Y is a defined benefit fund that has been closed to new members for many years. The Fund has 100 active members and 500 pensioners.

The last statutory actuarial valuation has just been completed as at 31 December 2022. The valuation revealed that the Fund has assets of R2 100 million and liabilities of R1 990 million which are split as follows:

a. The Fund has an active member account with R900 million in assets and liabilities of R800 million. The remaining R100 million is allocated to a solvency reserve and a risk reserve.
b. The Fund has a pensioner account with assets of R1 200 million and liabilities of R1 190 million.

The valuation also determined that:

a. The required employer contribution rate, net of members contributions of 7.0% of salaries, is 21.0% of salaries.
b. The average age of the active members is 58 years (normal retirement age is 65 years).
c. The average age of the pensioners is 68 years.

The key financial assumptions used in the valuation were:

- Rate of discount: 10.0% per annum
- Rate of price inflation: 6.0% per annum
- Salary increases: 8.0% per annum
- Pension increases: 6.0% per annum

The Fund targets pension increases in line with inflation, but this is subject to the pension increase being affordable.

The Fund's assets are invested with various asset managers in segregated portfolios. The overall asset allocation looks like a typical balanced portfolio as at 31 December 2022. The same investment strategy applies in respect of active members and pensioners. The pension increases over the last 15 years have averaged 120% of inflation. However, over the last 5 years the pension increases have averaged just below inflation.

A Trustee is concerned that recent pension increases are lower than expected and has mentioned that he thinks that a liability driven investment (LDI) strategy might be a solution to protect against lower future pension increases.

i. Explain what a LDI strategy is and how it is typically implemented in a retirement fund.
[6]

ii. Discuss the points you would make in response to the Trustee's concern, including how a LDI strategy might prevent lower future pension increases.
[5]

iii. Discuss how the implementation of an LDI strategy will impact on the valuation basis used for future valuations and the impact on any other actuarial calculations.
[4]

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Another Trustee has asked if the LDI strategy can be extended to the active member portion of the Fund.

iv. Set out the additional complications that need to be considered in implementing an LDI strategy in respect of the active members.

[5]

Another one of the Trustees asked what the differences are between an LDI strategy and the Fund purchasing annuities from an insurer in its own name.

v. Set out the main differences for the Trustee. [4]

Based on a quotation received, the Trustees agree that they will implement an LDI strategy for the existing pensioners and will include future pensioners in the strategy as well as and when they arise.

vi. Discuss the steps that the Trustees can take in order to minimise the investment risk up until the implementation of the LDI strategy and any future investment risk faced by the Fund.

[7]

[Total 31]

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QUESTION 3

A Company converted its defined benefit retirement fund to a defined contribution arrangement a number of years ago. A number of employees have raised concerns about their current level of benefits compared to their expected benefits. Company management has agreed to investigate these concerns.

They have asked that you start by explaining the components used in the calculation of the conversion value.

As a starting point, the conversion values consisted of members' individual actuarial liabilities and a share of the fund's solvency reserves.

i. Explain the calculation and the purpose of each component. [9]

Some of the concerns raised by members appear to relate to a comparison of their individual conversion value components to those of their colleagues. Management would like to understand the detail behind these calculations and the factors that would affect the individual member values, and why these may have differed across the membership.

ii. Explain the reasons for the different conversion values for individual members. [7]

The fund was in surplus at the time of conversion. The overall surplus in the Fund was apportioned between a Member Surplus Account and an Employer Surplus Account in proportion to each stakeholder's respective contribution rates. Company management have questioned whether this was fair to members.

iii. Discuss the general considerations for apportioning surplus between the two stakeholders and comment on the method that was used. [6]

The Member Surplus account was then allocated to all members in proportion to the sum of their actuarial reserve and share of solvency reserves. Management would like to understand whether this was reasonable.

iv. Explain why the apportionment method chosen could be considered the most reasonable method. [4]

The final component included in the conversion values was described as a "projected benefit reserve". It was intended as an additional component of the conversion value aimed at giving members a reasonable chance of achieving a pension equal to that which they might have achieved on retirement under the defined benefit fund. Management don't understand how this was calculated but understand that the calculation did not take account of the share of solvency reserve or share of surplus included in the conversion values.

v. Describe how the projected benefit reserve would be calculated, including the basis for each key assumption. [4]

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In order to assist management in their understanding of this component, they have asked you to demonstrate the calculation of the additional reserve that would have applied in each of the following examples:

	Age	Past Service	Salary	Actuarial Liability
Member 1	30	1	100,000	8,500
Member 2	50	10	450,000	895,000

Management have confirmed that the required contribution rates to target the pension of 2% of final salary for each year of service under the defined benefit fund was 7.5% and 22.5% for members and the Employer respectively. Members and the Employer currently each contribute 7.5% towards retirement savings under the defined contribution fund. The retirement age remained age 65 years under both funds.

vi. Determine the "projected benefit reserve" for each of the sample members and note any assumptions made.

[6]

vii. Briefly discuss your results. [3]

[Total 39]

[Grand Total 100]

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END OF EXAMINATION

