EXAMINATION

15 November 2017

Subject F104 — Retirement and Related Benefits Fellowship Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Use the instructions and password provided at the examination center to log in.*

2. *Submit your answers in Word format only using the template provided. You MAY NOT use any other computer program (e.g. Excel) during the examination.*

3. *Save your work regularly throughout the examination on the supplied computer's hard drive.*

4. *You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made.*
   You then have three hours to complete the paper.

5. *You must not start typing your answers until instructed to do so by the supervisor.*

6. *Mark allocations are shown in brackets on exam papers.*

7. *Attempt all eight (8) questions, beginning your answer to each question on a new page.*

8. *Candidates should show calculations where this is appropriate.*

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.

AT THE END OF THE EXAMINATION

Save your answers on the hard drive AND hand in this question paper.

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.

QUESTION 1

A bank specialises in offering mortgages. The bank is considering collaborating with an insurance company to create a retirement saving product aimed at its mortgage clients. The product aims to contract with customers to pay a certain proportion of their earnings for the duration of their working life. The required mortgage payments will be made first and the remainder will be invested in a retirement vehicle and used to build up funds which will be used to buy a pension in retirement. (The earnings percentage or term of the mortgage will be renegotiated if the contribution becomes insufficient to cover the mortgage repayments.)

i. Outline the Life Cycle hypothesis and discuss how this product is aligned with this hypothesis. [5]

ii. List, with reasons, 3 behavioural biases this product seeks to overcome. [3]

[Total 8]

QUESTION 2

The University of Morovia has a Defined Benefit fund. On reaching normal retirement age, members are paid pensions from the fund.

i. Explain what longevity risk is, how it might impact the fund and how it affects the various stakeholders in the fund. [7]

ii. The trustees are considering how they can manage the longevity risk. Outline the different options available to the trustees. [5]

The fund also offers death benefits equal to 5 times annual salary, which are secured with an insurer on a group life basis.

The university has recently insourced (hired as permanent employees, rather than using contractors) its cleaning staff, with the result that the fund membership has increased by 20%. The new members are generally less well educated and earn much smaller salaries than the original university staff. The group life assurance premium (charged as a percentage of salaries) has increased subsequent to the change in membership.

iii. Discuss why this increase may have occurred, and outline the options available to the fund in response to this increase. [4]

[Total 16]

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QUESTION 3

i. State the processes that should be followed when setting up an asset liability model to set an investment strategy for a retirement fund. [6]

A final salary scheme in a developing country has been closed to new entrants for over 10 years. The investment strategy of the scheme is to invest one third of assets in nominal government bonds, one third of assets in local equities and one third of assets in direct property investments, some of which are owned by the sponsoring employer. The fund allows members to take up to 100% of their retirement benefit as a lump sum but also offers a pension that is payable from the fund which increases annually with inflation. On death before or after retirement (provided the member is in receipt of a pension from the fund), a generous lump sum is paid.

ii. Discuss the suitability of this investment strategy. You may consider suitable alternative asset classes in your answer. [9]

iii. Suggest the main ways in which the regulator may want to limit the investment strategy of this and other similar closed defined benefit (DB) funds in the country concerned. Give reasons for your suggestions.

[4]

The regulator decides to limit the direct exposure to property for any one fund to 5% of total assets. All funds have one year to comply with the new regulation.

iv. Outline the implications of introducing this restriction for DB funds in the country, assuming that this fund's investment strategy is typical of DB funds in this country. [2]

[Total 21]

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QUESTION 4

i. Compare and contrast the Attained Age and the Projected Unit funding methods. [5]

ii. Accounting standards typically prescribe a method and assumptions to use for the purpose of preparing company accounts. The Projected Unit Method is the method typically prescribed in accounting standards. Suggest reasons for this. [2]

iii. You are required to calculate the relevant values for the financial statements of an employer with a recently established defined benefit pension scheme that has 800 active members. You are given the following information:

- Normal retirement age is 65
- Accrual is $\frac{1}{45}$
- Salary weighted average age is 47
- Average salary is R300 000 per annum
- Interest assumption is 9% per annum
- Wage inflation assumption is 7.5% per annum
- Average past service is 1 year
- Salaries and contributions are assumed to be paid annually in arrear

The AASCR has been calculated as 29.5% using the information and assumptions above.

Calculate the PUSCR and PUAL using a control period of 1 year and the same assumptions as were used to calculate the AASCR. [6]

[Total 13]

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QUESTION 5

The regulator of the retirement fund industry in a particular country has recently drafted legislation to the effect that all defined contribution retirement funds will be required to introduce a default investment portfolio that members' contributions will automatically be invested into unless they opt out.

The trustees of a large defined contribution fund are evaluating the fund's current investment strategy in light of the proposed regulation. They are considering making the current strategy the default strategy, and introducing other options for members who opt out.

i. Outline the factors that the trustees should consider when evaluating whether the current strategy is appropriate to be the default strategy for the fund. [7]

ii. Explain the risks that the proposed regulation introduces into defined contribution funds. [3]

The current investment strategy is that all assets are invested in a balanced portfolio. One of the trustees suggests that, because this fund does not provide a pension on retirement but pays members lump sums instead, the default investment strategy should contain an element of life-staging that includes a transition to money market and cash based investments with respect to members who are within 5 years of retirement.

iii. Evaluate whether this suggestion is appropriate if the main objective of the fund is to provide a reasonable standard of living to members after they retire. [4]

[Total 14]

QUESTION 6

i. Describe the stages in the demographic transition, commenting in each case on the changes in dependency ratios in the population. [5]

A country has gradually phased out childhood vaccinations against a particular potentially-fatal disease over the last 40 years because the disease was deemed to be eradicated. An outbreak of this disease occurs suddenly.

ii. Explain the likely impact of this outbreak on the state-funded pay-as-you-go retirement benefits. [6]

[Total 11]

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QUESTION 7

You are advising a very large and mature balance-of-cost defined benefit pension fund with a substantial book of pensioner members. The pension benefits are currently entirely self-insured. The trustees have asked you to perform a pensioner mortality investigation.

i. Explain how you would investigate the historic mortality rates relative to the statutory valuation basis. [3]

The Trustees are particularly concerned with the actual mortality rates and the rate of mortality improvement. The actuarial student you asked to perform the investigation has looked at these specific factors and demonstrated that the current pensioner life tables and mortality improvement factors used to value the fund are appropriate. In the conclusion to the draft report, he states “the investigation reveals that mortality risk on the fund is well-managed".

ii. Comment, with reasons, on whether you agree with the student’s statement. [6]

[Total 9]

QUESTION 8

The private sector of a particular country has a well-established retirement fund industry that enforces preservation and annuitisation of retirement benefits. Under the current regime members are required to purchase guaranteed annuities at retirement from a life company.

The government has come under pressure from trade unions to allow for retirement benefits to be paid out entirely in cash on retirement.

i. Suggest why trade unions may demand this for their members. [3]

ii. Give the main reasons why the proposal may not be in the interest of individuals and the state [1]

iii. Suggest how the state could modify the proposal to alleviate some of the risks. [4]

[Total 8]

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END OF PAPER

