

# EXAMINATION

*3 June 2020 (am)*

## **Subject F104 — Retirement and Related Benefits Fellowship Principles**

*Time allowed: Three hours and fifteen minutes*

### **INSTRUCTIONS TO THE CANDIDATE**

1. *Enter your candidate number as required in your examination answer.*
2. *Questions are only available in Moodle and may not be printed.*
3. *You are required to submit all your answers in this Moodle learning platform only. You MAY NOT use any other computer program (e.g. MS Word or Excel) during the examination.*
4. *You are strongly encouraged to use the first 15 minutes as reading time only, however, you may commence answering the paper whenever you are ready.*
5. *Mark allocations are shown in brackets.*
6. *Attempt all seven (7) questions.*
7. *Show calculations where this is appropriate. You may use blank paper to carry out rough work calculations. You may use an electronic calculator from the approved list.*
8. *You may return to your answers to review and amend during the allotted examination time. Once you are happy with your answers you need to **Finish all and Submit** your work. Once you have submitted you will not be able to make any more changes to your answers.*
9. *It is the candidate's responsibility to ensure that all work is submitted **BEFORE** the end of the allotted examination time. Take this into account when planning your review and submission.*

**Note: Answers will be saved automatically during the examination. However, 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 to a large, mature final salary pension fund sponsored by a financial services company. The fund has a large pensioner book with pensions paid from the fund and has recently closed to new members.

- i. Due to its closure to new members, you have suggested that the fund switch from the Projected Unit Method to the Attained Age Method. Explain the relationship between the standard contribution rates under the two methods and how the contribution rates would be expected to change over time, assuming regular valuations.

[3]

The trustees are discussing various options to manage the longevity risk.

- ii. It has been suggested that the fund use a buy-in strategy to manage the longevity risk. Briefly outline the advantages and disadvantages of this as a risk management strategy relative to maintaining the current position.

[5]

[Total 8]

## QUESTION 2

- i. List four reasons why the state might intervene in a country's economy by providing benefits.

[2]

A developed country with a mushroom-shaped population pyramid is currently experiencing an epidemic in the form of a virus. The virus is quick to spread and has a relatively high mortality rate at every age. Early research indicates that the mortality of infected members of the population is 80% higher in children under the age of 10 years.

- ii. Give a name for and explain the dynamics of a "mushroom-shaped" population pyramid.

[2]

The state supplies social support in the form of grants to families with children, old-age benefits, and health-care subsidies. All government benefits are funded on a pay-as-you-go basis from tax income. There is a well-established private employee benefit industry sponsored by private employers.

- iii. Outline the impact of the epidemic on the provision of the employer and state sponsored benefits.

[10]

[Total 14]

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### QUESTION 3

i. Define the following terms:

a. Accumulated fund credit [2]

b. Income replacement ratio [2]

You are the actuary to a large defined contribution pension fund that offers flexible benefits. The employer contribution rate is fixed at 3% of member salaries and the member can choose a contribution rate ranging from 3% to 15%. Also included in the flexible benefit design is investment choice, the level of death benefit, commutation percentage and annuity-type at retirement. Members may not commute more than 50% of their accumulated fund credit at retirement.

The fund trustees have asked you to calculate the income replacement ratio per member, based on the accumulated fund credits at a particular date.

ii. Outline the relationship that exists between a member's accumulated fund credit and their income replacement ratio. [2]

iii. Describe how the flexibility in the benefit design can complicate the projection of the income replacement ratio. [12]

[Total 18]

### QUESTION 4

You are the actuary to a retirement fund that has recently undergone a conversion from a defined benefit to a defined contribution structure.

i. Outline the factors you would consider when determining the investment strategy in a defined benefit fund. [8]

ii. Describe, with reasons, the investment strategy you would expect to see in the fund after the conversion to defined contribution. [4]

One of the investment advisors has suggested moving the DB fund assets to cash before converting to the DC investment strategy.

iii. Discuss the advantages and disadvantages of this suggestion. [8]

[Total 20]

### QUESTION 5

The government in a certain country is considering introducing a Pension Guarantee Fund (PGF). The PGF is a mandatory insurance arrangement to supplement the benefits received by members of pension funds that fail. It will be funded purely from levies from pension funds. There will be no funding from the government or regulator. The government is debating whether to fund the PGF in advance using regular or just-in-time levies. Evaluate these financing options, ignoring the effect of tax.

[12]

### QUESTION 6

In your country, employers are obliged to pay contributions into a defined contribution fund within four (4) working days of the end of the month to which they relate.

You are the actuary to a fund where over the last three years, the employer has been routinely late in paying contributions into the fund. The administrators have “resolved” this problem by calculating the members accumulated credits based on actual cash flows (cash accounting basis) as opposed to what should have happened (accrual accounting basis). Assume there are no measures in place by the regulator to discourage late payment of contributions by employers.

i. Explain the risks involved for the fund when a cash accounting rather than accrual accounting basis is applied to recognise contribution income.

[7]

ii. Outline how an actuarial valuation of the fund can be used to manage risks identified in (i).

[5]

iii. Outline measures the regulator could put in place to discourage late payment by employers.

[2]

[Total 14]

### QUESTION 7

The government of Parthia wishes to encourage savings through employer-sponsored pension funds. They currently offer no incentives to do so.

i. Explain what a behavioural incentive is, why it may be preferable to a traditional tax incentive and provide an example other than automatic enrolment.

[2]

ii. Explain how higher levels of savings in employer-sponsored pension funds may impact on savings levels in the economy.

[5]

After much debate the Parthian government decides that

a. employer contributions to retirement funds will have unlimited tax deductibility.

- b. member contributions will be tax deductible up to a certain percentage, subject to a monetary cap.
  - c. all employers must offer access to a retirement fund and employees will be automatically enrolled unless they opt out. Members may opt out of saving in the fund at any time but their savings cannot be withdrawn until they retire, change employer (when a transfer is allowed) or die.
- iii. Explain the effect on fund design that these incentives could be expected to have.

[7]

[Total 14]

**END OF PAPER**