EXAMINATION

30 May 2018 (am)

Subject F104 — *Pension and Other 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.*
7. *Attempt all nine (9) questions, beginning your answer to each question on a new page.*
8. *Show calculations where this is appropriate.*
9. *If answer booklets are used for any question(s) start each question IN A SEPARATE ANSWER BOOKLET, entering all candidate and examination details on EACH.*

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

i. List eight (8) reasons why employers may choose to pay workers in the form of benefits. [4]

The private sector of a particular country has embraced flexible benefit design in employment contracts in the recent past. In particular, employees are offered choices with respect to their retirement fund contribution level, investment strategy and death or disability benefit levels. They are able to choose their own medical aid provider and level of provision, and can forgo leave days in return for an increase in their monetary pay.

ii. Discuss the risks to employers and employees that will have been introduced as a result of the choices available to members. [9]

[Total 13]

QUESTION 2

The most recent set of financial statements produced for a defined contribution fund indicate that the available assets exceed the liabilities by a large amount. The change in the position since the previous set of financial statements, produced one year ago, is significant. The trustees have requested that you carry out a valuation on the fund to check whether the position shown in the financial statements is accurate.

i. Outline the process you would follow to determine the value of the liability at the valuation date. You may assume that all the necessary data has been made available. [5]

ii. After performing the valuation you can confirm that the liability in the financial statements is not correct. The actual liability is much closer in value to the market value of the assets. You conclude that the excess shown in the financial statements has arisen due to operational errors. Describe two risk factors that could have led to this outcome. [2]

[Total 7]

QUESTION 3

The state in a certain country provides mandatory unemployment benefits to all workers. The benefit scheme is run on a pay-as-you-go basis and earnings-related contributions are paid into the scheme by employers. Earnings-related benefits are paid to workers in periods that they do not work.

Apart from any demographic risks, outline six (6) risks that this fund may face and suggest possible mitigation strategies. [12]

[Total 12]

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QUESTION 4

The government of Cambria provides a mandatory disability benefit to all its employed citizens aged between 18 and 64. The scheme is funded on a pay-as-you-go basis with the revenue collected from an earnings-related payroll deduction. A citizen hoping to qualify for the benefit must apply within three months of falling ill or becoming injured. Their condition is assessed during this period and if they are still considered disabled at the end of the three-month waiting period, an earnings-related income benefit is paid.

It has been suggested that a modest flat-rate benefit is also paid to applicants during the waiting period. This benefit would start on the day the application is made and end if the claim is rejected or at the end of the three-month waiting period.

Describe the risks to the scheme of this proposal. [7]

[Total 7]

QUESTION 5

i. State the reasons why an Analysis of Surplus may be performed for a fund. [3]

A Defined Benefit fund has an accrual rate of $\frac{1}{60}^{\text{th}}$ of final pensionable salary (defined as the salary in the last year before retirement) for each year of past service, and a normal retirement age of 65. The last valuation was performed a year ago and had the following results:

Liabilities: R150 million
Assets: R260 million

The fund has only active members and had the following characteristics at the last valuation date:

Number of active members: 150
Salary-weighted average age of the active members: 38
Average pensionable salary: R350,000 per annum
Salary-weighted average past service: 4.5 years

The previous valuation was conducted using the Current Unit Method (CUM), with the assumption that investments will return 4% per annum, and there is no revaluation of benefits.

A year later, the fund characteristics have changed and are as follows:

Number of active members: 180
Salary-weighted average age of the active members: 37
Average pensionable salary: R360,000 per annum
Salary-weighted average past service of members: 5.3 years

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ii. Using the previous valuation results as a starting point, estimate the Current Unit Actuarial Liability (CUAL) that you expect the fund to have at the current valuation date if the assumptions are unchanged. [2]

The actual CUAL calculated using detailed member data is R200m. New regulation has been published recommending that funds no longer use the CUM. The fund actuary accordingly decides to change the funding methodology to the Projected Unit Method (PUM). Salaries are assumed to increase at 2% per annum. All other assumptions are unchanged.

iii. Using the above CUAL of R200m, estimate the amount you would include in the Analysis of Surplus (AOS) under the heading "Change in Valuation Methodology". [2]

The valuation is completed using the PUM and the AOS shows the following items, in addition to "Change in Valuation Methodology":

Item	Surplus/(Deficit)
Interest on Surplus	R9.2m
Investment performance	R15m
Withdrawals	R4m

iv. Briefly comment on how each of the above AOS items may have arisen. Where possible, check the items for reasonability. [3]

[Total 10]

QUESTION 6

Country A, which is a small, developed country, has recently seen a spate of retrenchments amongst the country's small to medium sized companies. The country currently has few regulations pertaining to retrenchments.

In order to protect its citizens from the financial impact of being retrenched, the government of country A is considering introducing legislation which requires a retrenchment benefit of 1 month of salary to be paid out to any retrenched worker. The governmental committee proposing this change has also suggested that all employers are required to hold sufficient funds in reserve to finance the retrenchment of all their workers. These funds would need to be held in a trust separate from the employer's funds.

i. Describe the financing method the above proposal represents, and explain why the committee may be suggesting this financing approach. [2]

ii. Outline other financing methods which could be used for this benefit, and comment on their effectiveness. [5]

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iii. Discuss the impact of the proposed requirement on the labour market and the economy of the country. [3]

iv. Comment briefly on whether the proposal addresses the government's goal of protecting workers from the financial impact of retrenchments and how else this might be achieved. [3]

[Total 13]

QUESTION 7

You are advising the trustees of a large defined contribution retirement fund. The sponsoring employer is a vehicle manufacturer. Most fund members are factory workers and staff turnover is relatively high.

The fund performs its own administration currently and uses an interim and final bonus system for allocating investment returns to accumulated fund credits. This means that asset values and accumulated fund credits do not change on a daily basis. Instead, at the end of each month, trustees consider the investment returns earned over that month and declare a final bonus for the month for members still active in the fund at month end. This bonus is then applied to the accumulated fund credits of the active members. If a member left the fund during the month, their fund credit is adjusted using an interim bonus rate for that month. The trustees estimate the interim bonus rate at the start of each month. For the purposes of applying the bonuses to exit benefits, the administrator assumes that the investment return is constant throughout the month.

All members are currently invested in a single investment portfolio selected by the trustees.

i. Briefly outline the risks to the fund of the interim and final bonus system. [4]

ii. After many years of operating on the interim and final bonus system, the fund has appointed a professional administrator who will also review the investment strategy and structure. Outline the changes to these areas that the trustees should consider to take advantage of the better systems that are now available. [8]

[Total 12]

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QUESTION 8

i. Identify three (3) different benefits that can be provided by a retirement fund and state how each one can meet the need for consumption smoothing over time. [3]

A developed country has historically compelled members retiring from occupational schemes to use their retirement savings to purchase a life-annuity from an insurer. Recently the regulator relaxed this condition and now retirees are allowed to apply all of their retirement savings to income drawdown products instead. Retirees may still purchase an annuity with their retirement savings if they prefer.

ii. Discuss the advantages and disadvantages of this change in terms of meeting the need of consumption smoothing at and during retirement. [12]

[Total 15]

QUESTION 9

i. List the constraints that the state would need to consider when deciding on its policy options relating to benefits. [3]

In a certain country, the following retirement benefits are in place:

- The old-age pension: The state provides a basic old-age pension of a fixed amount per month for all citizens over a certain age. This basic pension is funded from general tax revenue.
- The state earnings-related pension: The state also provides a mandatory pension arrangement for working citizens whereby earnings-related contributions are made during the citizens working lifetime and an earnings-related benefit is paid.
- Employer-provision: Employers may provide defined contribution funds which are voluntary to join for their employees.
- Other: Many elderly people live with their children.

ii. Classify these benefits in terms of the World Bank Multi Pillar (5 pillar) model. [2]

iii. Outline reasons why the state in this country might provide the basic and state earnings-related pension benefits directly. [6]

[Total 11]

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