

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

26 April 2011 (pm)

Subject ST4 — Pensions and other Benefits Specialist Technical

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*
2. *You have 15 minutes before 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.*
3. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*
4. *Mark allocations are shown in brackets.*
5. *Attempt all eight questions, beginning your answer to each question on a separate sheet.*
6. *Candidates should show calculations where this is appropriate.*

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper.

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| <p><i>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.</i></p> |
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- 1** (i) List six options that may exist for providing accrued benefits when a defined benefit scheme is discontinued. [3]

A defined benefit pension scheme has been managed for some years as a closed fund with no further accrual of benefits. The only liabilities remaining are in respect of current pensions in payment. The funding level at the last actuarial valuation was 100%. The rules of the scheme provide for annual pension increases in line with price inflation, and do not allow for benefits to be reduced on account of underfunding. No further financial support for the scheme will be available from the sponsoring employer or any other source.

- (ii) Outline the key risks that may result in pensioners' benefits not being paid in full, comparing the impact on the oldest and youngest pensioners. [5]
[Total 8]

- 2** (i) Describe five methods of measuring the strength of sponsor covenant. [5]

- (ii) Give one advantage and one disadvantage of each method identified in (i), ignoring any points relating to the cost of each method. [5]
[Total 10]

- 3** The trustees of a large defined benefit pension scheme have been reviewing their investment strategy. The aim of the review is to reduce the degree of mismatching of assets and liabilities by adopting an investment strategy based on corporate and government bonds.

- (i) Describe the key features of this investment strategy and the likely impact on the scheme's funding position. [5]
(ii) Discuss the issues associated with implementing this investment strategy. [5]
[Total 10]

- 4** (i) Give two distinct reasons why disclosure of pension scheme information in the sponsoring company's accounts is important. [2]

- (ii) With respect to the various accounting standards for pension scheme benefits:

- (a) Outline the common aims of these standards, and
(b) State the areas where these standards differ.

[4]

The latest ongoing funding valuation for a defined benefit pension scheme revealed a deficit, but the accounting valuation at the same date showed a surplus.

- (iii) Suggest possible reasons why the valuations are showing different results. [4]
[Total 10]

- 5** A defined benefit pension scheme was closed some years ago and now contains only pensions in payment. The pensions increase in line with inflation. The following information is available as at 31 March 2011:

| | |
|----------------------------|---|
| Market value of assets | £125m |
| Value of liabilities | £100m (on basis consistent with assets) |
| Average age of pensioners | 70 |
| Annuity at age 70 | 12 (on basis used to value liabilities) |
| Dividend yield on equities | 3% per annum |
| Average coupon on bonds | 6% per annum |

The scheme is currently invested 20% in cash and 80% in a diverse portfolio of high quality fixed interest corporate bonds.

The finance director has suggested that the scheme invests entirely in equities, as he believes that the return on equities will significantly reduce the cost to the company of providing the benefits. He is keen, however, to understand the risks relating to this strategy, relative to those for the current investment strategy.

Discuss the points you would make in a report on the finance director's proposal. The points you make should include:

- the implications for the relative income and outgo of the scheme, and
- the relative risks of the two strategies.

[10]

- 6** (i) List the criteria to consider when choosing a funding method. [2]

The government of a country has been using a simple mathematical model based on a single assumption of the population growth rate to project its total population size.

- (ii) Outline the shortcomings of using such a model to predict population change. [3]

The government provides its population with a state pension in retirement, which is funded using the pay as you go (PAYG) funding method. The country has had a low birth rate, relative to the death rate, for many years, but the population has now stabilised in a state where:

- the working population is smaller than the retired population,
- the population overall is no longer ageing, and
- the overall population size is neither increasing or decreasing.

- (iii) Discuss the suitability of PAYG for funding this pension arrangement, suggesting actions the government could take to address any problems you identify. [5]
- [Total 10]

- 7** The sponsoring employer of a defined benefit pension scheme has recently closed the scheme to future benefit accrual, and is concerned about the size and volatility of the funding deficit.

The current valuation basis for funding purposes is prudent, while best estimate valuation assumptions are used to determine transfer values available to members.

The employer is investigating the following options:

- offering members a financial incentive to transfer out of the scheme
 - offering members the option of giving up future increases to their pension in exchange for a one-off increase to their pension
- (i) Discuss the issues that the sponsoring employer might need to address when offering the above options to members. [8]
- (ii) Outline the issues that the members might consider before accepting the employer's proposals. [4]
- [Total 12]

- 8** The government of a developed country currently provides retirement benefits on a means tested basis. If a citizen has total savings of \$100,000 or less on their 65th birthday, the State then provides a flat pension of \$5,000 per annum until death. This is the minimum income that the State considers a citizen to need in order to have an acceptable standard of living. The pension is funded on a pay as you go basis through general taxation. If a citizen has savings of more than \$100,000 on their 65th birthday, the State provides no benefit.

- (i) Discuss whether this is an appropriate system for the government and the citizens of the country. [10]

As a result of a global economic downturn, the country's government is looking to reduce its expenditure and is considering redesigning the State retirement benefits system. The following design has been proposed:

A voluntary State-run pension scheme whereby citizens who wish to receive a State pension may choose to pay \$50,000 at age 65 in exchange for a flat pension of \$5,000 per annum until death. Citizens with savings of less than \$50,000 at age 65 will still be entitled to receive the same level of pension without contributing.

- (ii) Discuss the suitability of the proposed design compared with the current system, from both the government and citizens' perspectives. [13]

The government has considered the proposed design and decided that it will be too costly. However the government does wish to maintain the core idea of a flat State pension of \$5,000 per annum.

- (iii) Discuss possible changes that could be made to the proposed design in order to reduce the cost to the State. [7]
- [Total 30]

END OF PAPER