# EXAMINATION

8 September 2006 (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 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.*

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 7 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.*

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

**1** As actuary to a defined benefit pension scheme, you propose to carry out an asset liability modelling exercise on a stochastic basis. One of the trustees has asked you to explain the main features of such an exercise.

Set out the points you would make in your reply. [6]

**2** (i) Describe the main factors that contribute to the expenses of running a defined benefit pension scheme. [5]

(ii) Describe the options that the employer could consider to reduce these expenses. [5]

[Total 10]

**3** A centralised defined benefit pension scheme is run on behalf of several different employers within the same industry. A common benefit structure related to final salary applies to all scheme members. There is a wide range of benefits and options available on retirement, death or leaving service. Each employer pays the same contribution rate.

(i) Set out the advantages and disadvantages of a centralised scheme to participating employers. [8]

(ii) The scheme rules allow individual participating employers to approve the payment of enhanced benefits to its own employees. Suggest restrictions that could be applied to prevent a deterioration in the funding position. [4]

[Total 12]

**4** Currently, the only benefits provided by a defined benefit pension scheme are benefits to scheme members on retirement. The employer is considering extending the scope of the scheme to provide benefits to the dependants of scheme members on the death of a scheme member.

(i) Discuss the issues which the employer should consider before extending the scope of the scheme. [10]

(ii) Suggest how the employer might mitigate the risks associated with providing dependants' benefits. [4]

[Total 14]

**5** You provide actuarial services to a small company in a particular country which provides a funded defined benefit scheme for its 100 employees. You have recently completed a valuation of the scheme.

You have been asked to carry out a valuation of the country's unfunded defined benefit state sponsored scheme which currently covers approximately 1 million workers and their dependants representing the bulk of the working population.

(i) Describe the key differences between the two schemes with regard to the risks of each scheme to the sponsor and explain how these risks might be mitigated. [5]

(ii) Describe the differences between the data considerations, the actuarial assumptions and the funding objectives of the two valuations. [13]
[Total 18]

**6** An employer has recently introduced a defined contribution scheme for its staff. The scheme currently operates on an income drawdown basis at retirement, under which the fund remains invested and the member withdraws part of the fund each year as income.

(i) Describe the advantages and disadvantages to the scheme members of income drawdown. [6]

(ii) Explain the restrictions which the employer might impose on the operation of income drawdown. [3]

The employer is considering two further options:

Option 1: the accumulated fund would be used to purchase an annuity at retirement from an insurance company.

Option 2: the level of income which the member receives would be determined at retirement using the scheme's conversion factors. The pension payments would be met from the overall scheme assets.

(iii) Describe the advantages and disadvantages of each of options 1 and 2 from the point of view of the employer. [9]
[Total 18]

**7** You are the actuary advising the trustees of a defined benefit pension scheme which allows members to commute part of their own pension for tax-free cash at retirement. The scheme also allows members to purchase additional pension by augmentation. The member pays income tax on any pension in payment. Sample rates for the two options are set out below.

| *Age* | *Commutation Factor (i.e. cash granted for each unit of pension given up)* | *Augmentation Factor (i.e. cost of purchasing one unit of pension)* |
|---|---|---|
| 60 | 12.0 | 20.0 |
| 65 | 10.0 | 15.0 |

A trustee asks you why the published commutation factors are so much lower than the augmentation factors used for purchasing single-life pensions, and suggests it would be fairer to use the same factors for both calculations.

(i) Outline the key actuarial assumptions required to set commutation and augmentation factors, together with any further information needed regarding the benefits provided by the scheme. [6]

(ii) Discuss the arguments for and against using the same factors for commutation and augmentations, including any other issues that should be considered. [16]
[Total 22]

## END OF PAPER