INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

5 October 2011 (pm)

Subject SA4 — Pensions and other Benefits Specialist Applications

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 three 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 from the approved list.

1 A large UK defined benefit pension scheme is closed to new entrants. Active members continue to accrue benefits. The value of the pensioners' benefits represents 70% of the total technical provisions at the valuation date. All pensions are increased in payment in line with price inflation. The assets comprise 80% UK equities and 20% UK corporate bonds.

The trustees of the scheme commissioned an independent assessment of the strength of the sponsoring employer's covenant from a specialist adviser. The results of the report show that the covenant is weak, the business is winding down its operations in the UK, and the value of the scheme's deficit relative to the technical provisions is three times the size of the sponsoring employer's assets.

The Chief Financial Officer (CFO) is concerned about the significant size of the deficit shown at the recently completed triennial valuation. She is now considering ways to reduce the amount of risk in the pension scheme.

(i) Outline the main risks facing this pension scheme. [3]

(ii) Outline the features of five risk reduction options that the CFO could propose to the trustees, and discuss the advantages and disadvantages of each option from the viewpoint of both the employer and the members. [25]

After some discussion, the trustees and the sponsoring employer decide to embark on a long-term strategy to reduce gradually the risk in the assets and the liabilities. Their objective is that, on completion of the strategy, the pension scheme would have sufficient assets either to secure benefits with an insurer or to operate as a closed scheme without further financial support from the sponsoring employer, with assets that match the liabilities very closely.

(iii) Discuss the key considerations for the trustees and the sponsoring employer when deciding how to achieve their objective. Your answer should include reference to:

- the target liabilities and funding position
- the probability of achieving their objective
- the timescale of the long-term strategy
- changes to investment strategy over time
- options available if the funding level is better or worse than expected in the intermediate years

[22]
[Total 50]

2 The trustees of a large defined benefit scheme have asked for information on how they should choose the mortality assumption for the valuation.

(i) Discuss the general principles that should be considered when choosing the mortality assumption. [5]

(ii) Outline the key considerations in using a mortality table calculated from the scheme's own experience. [3]

The trustees are considering using a postcode benchmarking methodology, whereby information on the exact locations of the membership is used to provide a suitable adjustment to a standard mortality table.

(iii) Discuss the suitability of using this proposed postcode benchmarking methodology. [5]

(iv) Discuss how the Scheme Actuary might allow for future improvements in life expectancy for the mortality assumption. [4]

The trustees are concerned about longevity risk, and have asked the Scheme Actuary for information on the following two methods of mitigating it:

- longevity swaps
- immediate and deferred annuity policies

(v) (a) Discuss the key features of each method

(b) Outline how each method could mitigate the longevity risk.

[8]

[Total 25]

3 A UK coal mining company currently runs a final salary pension scheme but is concerned about the cost of the scheme to its business.

- Pensions accrue at the rate of 1/60th of pensionable salary for each year of service.

- Pensionable salary at retirement is the rate of the member's gross salary at that point.

- Salary increases are awarded on 31 December each year.

- The scheme has a normal retirement age of 62.

- In retirement, pension increases in line with price inflation are granted each year.

The company has commissioned a review of the scheme and as a result has announced the following proposed changes to the members:

A. A cap of 1% per annum to be imposed on the rate at which pensionable salaries may increase from 1 January 2012 (applying to pension earned before and after this date).

B. The normal retirement age of the scheme to increase to age 65 in respect of benefits accrued after 1 January 2012.

The company has asked for an illustration of the impact of these benefit changes using the following sample member details:

- male
- aged 50 exact at 1 January 2011
- pensionable salary at 1 January 2011 of £20,000
- pensionable service of 15 years at 1 January 2011

For parts (i) and (ii) below you should:

- assume for each proposed benefit change that no other changes occur, i.e. consider each change in isolation

- use an effective date of 1 January 2011; and

- state any further assumptions that you make

(i) Estimate, in percentage terms, the impact that each of the above changes A and B would have on the current value of the sample member's retirement benefits, assuming that he continues to be an active member and retires at age 62. [8]

Currently active members who retire due to ill health are entitled to a temporary pension equal to the pension they would have received had they remained an active member of the scheme until normal retirement age, based on pensionable salary at the actual date of ill health retirement.

The company has also proposed that instead of an ill health pension, members will receive a lump sum of three times pensionable salary on ill health. On reaching normal retirement age, members will receive the same level of pension as the ill health pension payable at that point prior to the scheme review.

(ii) Estimate, in percentage terms, the impact that this change would have on the current value of the sample member's ill health benefit. You should ignore changes A and B in your calculation. [4]

After consulting with the members of the scheme the company has decided to revise the benefits payable to active members on ill health. Instead, the company proposes that members will receive a lump sum of four times pensionable salary on ill health. Furthermore, the company will compensate members who, as a result of moving to a lump sum benefit, would receive a lower benefit on ill health. The company's actuary will perform a calculation for each member as at 1 January 2011 comparing the value of the four times pensionable salary lump sum ill health benefit with the value of the ill health pension that was payable prior to the scheme review. Any shortfall will be paid to members by uplifting their annual gross salaries over their remaining expected career with the company.

(iii) (a) Outline the assumptions that the company's actuary will need to make to perform this calculation.

(b) Discuss the issues that the actuary should consider when determining the overall prudence of the basis for these calculations.

[8]

(iv) Discuss how the scheme members are likely to view this revision of the company's proposals. [5]

[Total 25]

END OF PAPER