EXAMINATION

8 September 2005 (pm)

Subject ST2 — Life Insurance
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 A life insurance company has written individual term assurance business for many years. In the past it has reinsured a very small proportion of this business.

(i) Describe why the life insurance company might have reinsured some of its business. [4]

(ii) Describe why the life insurance company may look to reinsure a greater proportion of its new term assurance business in the future. [7]

[Total 11]

2 A life insurance company writes only conventional without profits business.

(i) List the sources of risk for the in-force business. [4]

(ii) Explain how new business can be a source of risk. [8]

[Total 12]

3 (i) State the main requirements that an actuarial model should satisfy. [5]

A unit-linked single premium whole life policy allocates 101% of the premium into units. The policy can be surrendered at any time and the policyholder will receive the bid value of units held at that time. However, on the tenth policy anniversary, the policyholder will receive the higher of the bid value of units and the original premium. The only charge under the policy is an annual management charge. A deterministic cashflow model is used to determine an appropriate level for the annual management charge.

(ii) Explain why this model is unlikely to produce an appropriate charge for the return of premium guarantee at the tenth anniversary. [5]

(iii) Explain why a stochastic model would be better than a deterministic model for this purpose. [3]

[Total 13]

4 A life insurance company in an economically developed country has a large in-force portfolio of level immediate without profit annuities. It wishes to assess its liabilities on a "market consistent basis" using a financial economic modelling approach.

(i) Describe a model that could be used to perform this calculation. [5]

(ii) Discuss how the assumptions used within the model might be determined. [9]

[Total 14]

5 A proprietary life insurance company has previously only sold unit-linked policies and has limited free assets. It is about to launch a single premium with profits product with a term of 10 years for which the majority of assets will be invested in equity-type investments. Surplus will be distributed using the additions to benefits method through a combination of reversionary and terminal bonus. The company will explain its bonus distribution policy in its marketing literature.

Discuss the factors that the company should take into account when considering the split between reversionary and terminal bonus. [14]

6 A life insurance company has a large portfolio of single premium whole life unit-linked bonds. The single premium can be invested in any one of a range of available linked funds.

The policy provides a death benefit equal to 101% of the bid value of units and a surrender value of the bid value of units. There is an annual management charge of between 0.75% and 1.5% per annum of the bid value of units depending on the fund chosen. No other charges are made on the policy.

A policyholder may switch between funds at any time. The first switch in any year can be made free of charge, and any further switches incur a charge which is linked to inflation. Past experience has shown that on average policyholders switch more often than once per annum.

The company is about to perform the calculation of its supervisory returns for this product.

(i) Describe the principles that it should follow. [6]

(ii) Describe how the company would set the assumptions for this purpose. [10]

[Total 16]

7 A life insurance company last conducted a full analysis of its management expenses five years ago, and since then has used this as the basis for setting expense assumptions when calculating its supervisory reserves.

It is proposed that a new expense analysis will be carried out to help set assumptions for use at the next statutory valuation.

(i) Describe how the analysis might be carried out. [15]

The Finance Director has queried the cost of carrying out a new expense analysis and has proposed that the existing method of adjusting the old expense analysis by inflation should continue to be applied.

(ii) Discuss the Finance Director's suggestion. [5]

[Total 20]

END OF PAPER