EXAMINATIONS

17 September 2003 (am)

Subject 302 — Life Insurance

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.*

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 Actuarial Tables and your own electronic calculator.

1 (i) List the main sources of capital available to a life insurance company. [3]

(ii) Outline the reasons why a life insurance company needs capital. [6]
[Total 9]

2 A life insurance company sells all types of life insurance and pensions business. It has an embedded value calculation model that projects all future expenses as a percentage of premium, rather than on a per policy basis.

Discuss this approach. [10]

3 A life insurance company writes three types of endowment assurance:

- A unit-linked contract, where the only charges are a mortality charge levied by cancellation of an appropriate number of units, an annual management charge and a surrender penalty. All charges are guaranteed from outset.
- A conventional without profits contract.
- A conventional with profits contract.

Both the conventional contracts have surrender values that are at the discretion of the company.

(i) Describe how the maturity values for each of the contracts are likely to compare for a given amount of premium and term. [5]

The policies are used to repay the capital sum under a loan. The loan interest is paid directly to the lender by the policyholder. All contracts have a guaranteed death benefit equal to the amount of the loan.

(ii) Discuss the risks borne by the policyholders under each type of contract. [7]
[Total 12]

4 A life insurance company writes a significant volume of term assurance business. New business volumes have fallen by 30% over the past three months. Analysis of the market indicates that a 20% reduction in premium rates is required to regain lost business and achieve the target of a 10% increase in the volume of new business.

(i) State possible reasons for the fall in new business. [3]

(ii) Describe how the impact on profitability of this reduction in premium rates would be determined. [4]

(iii) Discuss the factors that would be considered before a rate reduction was implemented. [7]
[Total 14]

5 (i) State how underwriting is used to manage a life insurance company's risks. [5]

(ii) List the sources of information that a life insurance company can use in the underwriting process to establish the level of mortality risk for a particular applicant. [3]

The underwriting process has shown that an applicant has recently been diagnosed with a particular disease. 90% of individuals contracting this disease die from it, with death occurring around twenty years from the date of diagnosis. The 10% who survive the disease cease to show any symptoms within three years from diagnosis.

(iii) Discuss the terms that might be offered to the applicant in respect of each of the following contracts:

(a) a 10-year term assurance
(b) a 10-year convertible term assurance
(c) a 20-year endowment assurance
(d) a whole life assurance
(e) waiver of premium benefit on a pensions contract [7]

[Total 15]

6 A life insurance company believes that it has identified a gap in the market and that it can sell profitable term and critical illness insurance to financially unsophisticated investors who have below average disposable income.

(i) Describe the features of the target market. [3]

(ii) Discuss the different distribution channels that might be available to the company to market these products to this type of client, and identify the channels that would be the most appropriate. [16]

[Total 19]

7 A life insurance company has been selling regular premium unit-linked endowment assurance contracts for many years. The contract provides a death benefit equal to the greater of the value of units at the time of death or a guaranteed fixed monetary amount. At maturity the benefit is equal to the value of units. There is no guaranteed minimum maturity benefit.

Charges are deducted from the unit fund in respect of expenses and to cover the cost of life assurance cover.

On surrendering the contract prior to the maturity date, the benefit payable is less than the value of units and is not guaranteed.

(i) Describe with reasons how the company would determine the supervisory reserves for this contract. [A numerical basis is not required.] [8]

(ii) Discuss the factors that would be considered in setting the supervisory reserving basis. Details of any investigations are not required. [9]

(iii) Describe how the mortality and expense assumptions used in determining the supervisory reserves might differ from those used in the pricing basis for this contract. [4]

[Total 21]