Faculty of Actuaries **Institute of Actuaries**

EXAMINATIONS

12 April 2000 (am)

Subject 302 — Life Insurance

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *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.*

2. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*

3. *Write your surname in full, the initials of your other names and your Candidate's Number on the front of the answer booklet.*

4. *Mark allocations are shown in brackets.*

5. *Attempt all 8 questions, beginning your answer to each question on a separate sheet.*

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet and this question paper.

In addition to this paper you should have available Actuarial Tables and an electronic calculator.

1 (i) Explain why insurance supervisors require life insurance companies to maintain a specified level of solvency capital. [2]

(ii) Discuss the relationship between the strength of the supervisory reserves for a life insurance company and the level of solvency capital required. [3]

[Total 5]

2 Describe the key factors that influence the adequacy of an actuarial model, used for projecting cash flows to assess the profitability of a life insurance contract. [7]

3 A life insurance company is considering entering the market for long-term care contracts which cover the costs for an elderly person of home or nursing-home care.

Describe the factors the company must consider in designing this new contract to ensure a successful launch can be made. Your answer should consider benefit and claims definitions as well as the normal profitability considerations. [10]

4 A life insurance company is launching a ten year regular premium unit-linked endowment assurance with a wide range of investment links and a guaranteed minimum maturity value.

Discuss the risks for the company in offering this product. [10]

5 (i) Describe the contribution method for distributing any surplus which may arise from a with profits life insurance contract. [5]

(ii) Describe the principal practical difficulties that may need to be overcome. [3]

(iii) State the formula commonly used to distribute surplus via the contribution method, defining any notation used. [2]

[Total 10]

6 A life insurance company offers a without profits term assurance contract.

(i) Describe the reasons for underwriting a client's application for the contract. [4]

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

(iii) Describe the options open to the company if the underwriting process shows an applicant to have a higher expected level of mortality risk than that priced into the product terms. [4]

[Total 11]

7 A life insurance company is analysing the withdrawal experience of its unit-linked endowment assurances.

(i) List the data required for the analysis and discuss the level of detail to which the analysis might be performed. [11]

(ii) Describe why the current experience may not be indicative of the future. [5]

(iii) Describe how the results of the analysis might be used. [6]
[Total 22]

8 A life insurance company markets single premium without profit immediate annuities. The premium rates include an allowance for the company's administration costs equal to 1% of each cash annuity payment.

(i) List the features that could be offered under the contract. [3]

(ii) Describe the principal risks the company faces in relation to the contract. [8]

(iii) Discuss the actions available to the company to limit the impact of each risk identified in part (ii) on its financial position. [14]
[Total 25]