

EXAMINATIONS

April 1997

Subject F — Life Insurance

Paper Two

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.*
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 4 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.

<p><i>In addition to this paper you should have available Actuarial Tables and an electronic calculator.</i></p>
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- 1** (i) A proprietary life office is repricing its conventional with-profits contracts. Discuss the main considerations that should be taken into account for each of the following elements:
- (a) interest
 - (b) bonus loadings
 - (c) taxation [15]
- (ii) State and justify the basis you would use for each of the elements above when pricing a regular premium endowment contract. [5]
- (iii) Explain how your answer to (ii) would alter if the contract were a regular premium pension contract, with no annuity guarantees on vesting. [3]
- [Total 23]

2 A mutual life office writes all types of with-profits life and pension business.

- (i) Describe the factors influencing the choice of assets comprising the office's with-profits fund. [18]
- (ii) The life office has recently launched a single premium unitised with-profits contract. The contract has an initial accumulation rate of 7% p.a. and includes a guarantee that a market value adjuster will not be applied on encashment at the fifth policy anniversary.

Discuss the factors the life office should take into account when investing the single premiums. [9]

[Total 27]

- 3 A proprietary life office is about to redesign its unit-linked endowment assurance contract, which makes up a significant proportion of its in-force and recent new business.

The pricing actuary has proposed two alternative charging structures for the new contract. He has calculated the discounted profitability of each proposal to be similar to that of the current structure, provided that non-unit reserves (which are not held at present) will not be required.

The current charging structure and the suggested alternatives are as follows:

	<i>Current</i>	<i>Proposal (a)</i>	<i>Proposal (b)</i>
<i>Initial allocation rate</i>	50%	30%	N/A
<i>Initial allocation period</i>	12–30 months depending on policy term	18–36 months depending on policy term	0 months
<i>Subsequent allocation rate</i>	100%	105.3%	90%
<i>Fund management charge</i>	1% p.a. (variable at discretion)	½% p.a. (guaranteed)	<i>As current</i>
<i>Administration charge deducted from unit</i>	£2.00 per month (guaranteed)	None	<i>As current</i>
<i>Mortality charge</i>	120% of current experience (guaranteed)	<i>As current</i>	100% of current experience (variable at discretion)
<i>Surrender penalty</i>	None	<i>As current</i>	100% of initial commission paid reducing by 10% per annum simple to zero at the end of 10 years

The following contract features will not change:

- There is a bid/offer spread of 5% of the offer price on all the internal linked funds.
- Initial commission is 30%–65% of annual premium, depending on term, and renewal commission is 2½% of premiums.

For each of the proposals (a) and (b):

- (i) List the principal changes to the contract design, and explain how each may be expected to affect the statutory valuation reserves held. [11]
 - (ii) List the investigations which would be carried out, describing any further information which would be required to determine the basis and assumptions for the statutory valuation of the redesigned contract. [6]
 - (iii) Explain how the statutory valuation basis may affect the emergence of profit, the discounted value of future profits and the level of charges required under the redesigned contract. [8]
- [Total 25]

4 A mutual life office transacts all types of non-linked life and pensions business. A substantial proportion of the policies in force are with-profit endowment assurances. The office is about to review its terms for surrender and conversion to paid-up status for these contracts.

Conversions to paid-up are currently made on a proportionate sum assured basis, with attaching bonuses also reduced proportionately. Surrender values are currently calculated by a prospective method, with a proportionate allowance for terminal bonus.

- (i) State the conditions that should be satisfied by the office's revised terms for surrender and conversion to paid-up status. [5]
 - (ii) Describe an alternative method that could be used for the calculation of each of the surrender and paid-up values. *Formulae are not required.*[4]
 - (iii) State the advantages and disadvantages for the office of the current methods, and of the alternative methods in your answer to (ii). [11]
 - (iv) List the investigations that would be needed to determine an appropriate set of assumptions for the prospective surrender value calculation. [5]
- [Total 25]