

INSTITUTE AND FACULTY OF ACTUARIES



EXAMINATION

20 September 2018 (pm)

Subject SA2 – Life Insurance 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 must not start writing your answers in the booklet until instructed to do so by the supervisor.*
3. *You have 15 minutes of planning and reading time before the start of this examination. You may make separate notes or write on the exam paper but not in your answer booklet. Calculators are not to be used during the reading time. You will then have three hours to complete the paper.*
4. *Mark allocations are shown in brackets.*
5. *Attempt both questions, beginning your answer to each question on a new page.*
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 UK life insurance company sells single premium unit-linked savings products and unit-linked group pension products. It also has a large closed book of immediate annuities.

The annuities are well matched by fixed interest assets and the company uses a matching adjustment. The assets backing the unit-linked liabilities are invested in a mixture of equities and property.

The company does not invest in derivatives and it has no reinsurance arrangements in place.

The company calculates its Solvency Capital Requirement (SCR) using a partial internal model. The capital requirements in respect of all risks are calculated using an internal model except for operational risk for which the Standard Formula is applied.

Interest rates have historically been low and mortality rates have been continually reducing over a number of years.

The table below sets out the results of the company's SCR calculations.

<i>Risk £m</i>	<i>Undiversified SCR</i>	<i>Diversified capital</i>
Equity values down	1,500	1,000
Property values down	500	250
Interest rates up (based on a swap curve)	800	(50)
Credit spreads widen	2,000	1,500
Counterparty default	5	0
Level of expenses up	500	150
Expense inflation up	100	30
Persistency (higher lapses)	600	100
Mass lapse	500	80
Longevity (annuity mortality rates reduce)	2,000	1,300
Mortality (mortality rates increase)	100	(10)
Operational Risk	200	200

- (i) Discuss the factors that contribute to each of the individual undiversified SCR capital figures in the table above. [13]

The company assumes that under the SCR stresses, the losses made receive tax relief. It justifies this by assuming it will make profits on new business sold over the next five years, and that these profits will offset the losses made under the stressed scenarios.

- (ii) Discuss the factors the company should consider in justifying this approach. [3]

- (iii) Describe one other factor which could be used to cover the loss absorbing capacity for deferred tax. [1]
- (iv) Suggest reasons why interest rates, and separately, mortality have a positive undiversified SCR and a negative diversified SCR. [2]
- (v) Explain which three risks shown in the table on the previous page are the most significant. [2]

The company is required to report sensitivities on its own funds and SCR. The following is a subset of the sensitivities reported:

- An increase in interest rates (based on swap curves);
- An increase in equities;
- A large increase in lapses.

- (vi) Discuss the impact of each of the above sensitivities on both the undiversified SCR for the risks you identified in part (v) and on the own funds. [20]

The following year, the company experienced a large increase in lapses. An experience investigation revealed that this was partly the result of the withdrawal of a very large Group Scheme due to the availability of more competitive charges in the market.

- (vii) Suggest possible actions the company may take in response to this. [3]

The company is considering moving to a full internal model, as opposed to a partial internal model.

- (viii) Suggest the types of operational risks that would now need to be considered related to the products the company offers. [4]

[Total 48]

- 2 A life insurance company only writes conventional immediate annuity business (including impaired life annuities) and writes these through financial advisers. Recent changes in legislation have meant that the volume of new business has significantly reduced.

The company is considering developing the following products:

- Inheritance tax planning cover: a conventional without profits whole life assurance product that aims to pay the inheritance tax that becomes due on the policyholder's death. The sum assured would be set by the policyholder at outset and will increase with the national inflation index.
- Guaranteed over 50s cover: a conventional without profits whole life assurance product sold to those aged 50 and over, where cover is provided without underwriting. The sum assured is relatively small and cannot be greater than \$10,000.

For both products, level premiums are payable throughout the life of the policyholder and depend on the age of the policyholder at outset.

- (i) Explain why these particular products may be appropriate for this company. [4]
- (ii) Describe the risks to the policyholder of the inheritance tax planning product. [8]
- (iii) Discuss whether the company's existing distribution channels will be suitable for the likely target market of the guaranteed over 50s product. [4]
- (iv) Describe how conduct risk may arise for the company if it chooses to launch the guaranteed over 50s product. [6]

The actuary has prepared a report around the level of risk to be considered when designing and pricing the guaranteed over 50s product.

- (v) Discuss the **other** factors which would need to be considered when designing and pricing the guaranteed over 50s product. [30]
- [Total 52]

END OF PAPER