INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

20 April 2017 (am)

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 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 all five 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 (i) Outline reasons why it is important for a life insurance company to have high quality policy data. [4]

A life insurance company is performing its annual mortality experience investigation for its term assurance business.

(ii) Describe the checks that the company could perform in order to ensure that the data being used for this investigation is accurate. [8]

[Total 12]

2 A life insurance company sells only conventional without profits level immediate annuities. The liabilities are matched by corporate bonds of appropriate duration and currency, which are expected to be held until maturity. It also invests its free assets (the excess of assets over liabilities) in corporate bonds and holds no other type of asset.

The following information is available as at the most recent valuation date:

Market value of assets	\$2.00m
Assets valued using a discounted value approach, with a risk-free discount rate and an adjustment for credit risk	\$2.05m
Liabilities valued using the actual yield on assets held and best estimate assumptions	\$1.80m
Liabilities valued using a risk-free discount rate and best estimate assumptions	\$1.92m

(i) Describe how the risk-free discount rate could be derived. [3]

The company wishes to calculate its free assets on a market consistent valuation basis.

(ii) Discuss whether there is sufficient information provided above to derive the free assets on a market consistent basis, including:

- which of the asset and liability valuations would be used, if any, and
- any additional information and adjustments that may be required. [9]

The average outstanding duration of the in-force immediate annuities is much longer than five years. Yields are currently higher on corporate bonds with a duration of five years compared to longer term bonds. The company is considering revising its asset matching strategy to invest in five-year corporate bonds and then to reinvest the maturity proceeds in corporate bonds of appropriate duration after the five years has elapsed.

The company first wishes to understand the implications of this proposed new investment strategy for the value of the liabilities and free assets on a market consistent basis. At this stage, it is interested only in the direction of change and not the magnitude of change.

(iii) Assess the implications for the market consistent values of the liabilities and free assets, making clear your reasoning. [4]

[Total 16]

3 A life insurance company writes unit-linked endowment assurance business which is designed to be used as a method of saving for a pension at retirement.

Under legislation, the contract cannot be surrendered for cash before the chosen date of retirement, but it can be transferred to another insurance company or made paid-up.

The company has a large volume of experience data and is about to conduct an investigation into the persistency experience of this business.

(i) Assess whether it would be appropriate to analyse the persistency experience by the following factors:

(a) age
(b) smoker status
(c) distribution channel

[9]

(ii) List other factors by which it may be appropriate to split the data in the persistency investigation for this product. [3]

(iii) Describe other aspects that may influence the persistency experience of this product. [9]
[Total 21]

4 A new life insurance company is planning to enter the market with a unit-linked endowment assurance product.

The product is aimed at customers wishing to actively manage the assets in which the product is invested through frequent switches between unit funds.

The product would also allow the customer the flexibility to change the premium and the guaranteed minimum death benefit at any time.

The product has a number of other features which are unique in the market.

(i) Discuss the extent to which each of the main distribution channels would be appropriate for this product. [10]

(ii) Explain how regulatory restrictions could impact the design of this product.
[12]
[Total 22]

5 A company operates in a market where it is not currently possible to surrender an in-force immediate annuity for a cash sum.

Legislation is being proposed that would allow surrenders of in-force immediate annuities in exchange for a cash sum from the original annuity provider. It would not be mandatory for life insurance companies to offer surrenders to their annuity policyholders, but the change in legislation would mean that it would now be possible to do so.

(i) List the assumptions that a life insurance company would need in order to calculate a prospective surrender value for an immediate annuity. [3]

(ii) Describe the factors that the company would need to consider in setting each of these assumptions. [10]

(iii) Discuss whether the company should offer surrender values on immediate annuities. [5]

As an alternative to a surrender value, the company is considering offering alterations to in-force immediate annuities.

(iv) Explain how the principles for general alterations would apply to the immediate annuity alterations. [7]

(v) Propose four possible alterations that could be made to an in-force immediate annuity. [2]

(vi) Suggest, for each of these alterations, a reason why it might be requested by a policyholder. [2]
[Total 29]

END OF PAPER