INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

26 April 2013 (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 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 seven questions, beginning your answer to each question on a separate sheet.*

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 life insurance company distributes profits using the contribution method.

Value of the contract at the start of the year on the valuation basis	1,000
Value of the contract at the end of the year on the valuation basis	1,200
Gross premium	100
Actual rate of interest earned	5%
Valuation basis rate of interest	4%
Actual rate of mortality experienced	0.004
Valuation basis rate of mortality	0.005
Sum assured	10,000
Actual expenses experienced under the contract	10
Valuation basis expenses	15

Calculate the dividend applicable, showing your workings. [4]

2 A life insurance company has decided to outsource the administration of new and existing policies for a selection of its products. The outsourcing agreement will be in place for ten years and will only cover tasks which are specified in the agreement.

The outsourcing company has provided a schedule of initial and renewal costs per policy, which vary depending on the premium frequency of the policy and the number of policies in-force.

Describe the factors that the insurance company needs to consider when allowing for the impact of the outsourcing agreement in its future expense assumptions. [6]

3 A life insurance company uses the "surrender value respread to reduce future premiums" approach for alterations to regular premium contracts, other than where the policyholder is converting their policy to paid-up status.

(i) State how this method is applied. [2]

(ii) Explain the extent to which this method meets the principles for general alterations. [5]

[Total 7]

4 A life insurance company sells a conventional without profits endowment assurance product which is written with a maturity age of 70, but which also allows the policyholder to take a discounted lump sum benefit at either age 60 or 65, these amounts being defined at the start of the contract.

The product also offers guaranteed rates for conversion of the lump sum benefit to an immediate annuity at ages 60, 65 and 70.

(i) Discuss the main risks to the company of offering the guaranteed annuity rate option on this product. [8]

(ii) Describe different methods by which the company could have determined the charge for the option. [9]

[Total 17]

5 A life insurance company uses a simplistic “top-down” approach to set its expense assumptions, whereby all expenses are allocated across the products in proportion to the in-force policy count.

A new finance director has asked the actuaries and accountants to perform a “bottom-up” review of expenses. Under this new approach, per policy expense assumptions are determined by first considering the actual direct costs of selling and administering policies and then adding an allowance for overhead costs.

(i) Suggest reasons why the director has proposed this new approach. [3]

(ii) Describe the additional information that the company will require in order to determine expense assumptions using the new approach. [7]

The “bottom-up” review has now been performed and the new per policy expense assumptions have been determined.

(iii) Describe the checks that the company could perform on these new assumptions. [6]
[Total 16]

6 A life insurance company sells immediate annuities. It is undertaking a mortality experience investigation.

(i) List the possible sources of data for this investigation. [4]

(ii) Describe the risks to which the company is exposed in relation to these data sources. [8]

(iii) Describe the actions that could be taken to minimise these risks. [8]
[Total 20]

7 A large multinational proprietary life insurance company is in negotiations with the government of a particular country to write a new government backed scheme to provide child funeral costs. A significant proportion of the country's population is low income, and the infant and child mortality rates are relatively high. The scheme would provide cover for all children of the policyholder, and the premium would be the same irrespective of the number of children covered.

The benefits would be to provide all the basic funeral costs on the death of each insured child if this occurs before they reach age 18. The policy would continue after the death of a child if there are other children of the policyholder who are still alive.

Underwriting would be on a health questionnaire basis only. The policy would automatically include all new-born children.

The government would endorse the insurance company and would allow tax relief on premiums. The insurance company would be the only company allowed to provide this type of insurance. The company does not currently write this type of contract in any other country.

(i) Describe the factors that the company should consider in determining a suitable design and price for this product. [19]

(ii) Explain why the company would use a cashflow rather than formula approach to price this product. [8]

(iii) Discuss how the company would set model points in order to price this product. [3]

[Total 30]

END OF PAPER