INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

27 September 2018 (pm)

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 seven 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 Suggest possible reasons why the payout from a with profits policy might be different from the policy's asset share. [5]

2 A life insurance company is considering launching a new with profits product. The new product will allow policyholders the flexibility to alter the level of premiums and to take withdrawals.

The company is considering which of the various methods available for distributing surplus it should use for this particular product.

Assess the suitability of each of these methods for use in distributing surplus for this product. [10]

3 (i) Define the appropriation price for an internally managed unit-linked fund. [1]

A life insurance company calculated the appropriation price for an internally managed UK equity unit-linked fund at the 31st May as follows:

Market offer value of the equities at 1st January in the fund
plus
Expenses incurred in purchasing all equities held by the company
plus
Current assets of the unit-linked fund
less
Allowance for accrued tax
divided by
Number of units after any new units are created

The company has been reviewing the calculation of the unit prices for their internally managed unit-linked funds. It has noted some errors in the appropriation price for the UK equity fund.

(ii) Outline the errors in the way the appropriation price has been determined. [3]

(iii) Suggest the steps the company would take in order to correct the errors for policyholders. [5]
[Total 9]

4 A life insurance company sells conventional without profits and unit-linked products within a non-profit fund. The policyholders in this fund are not entitled to any surplus arising within the fund.

It also sells conventional with profits products within a with profits fund, where the policyholders are entitled to all of the surplus arising within that fund.

The company has a separate shareholder fund and the policyholders are not entitled to any surplus arising within that fund.

(i) Define the term 'embedded value'. [1]

(ii) Describe how the company would calculate its embedded value. [8]

(iii) Discuss how the approach outlined in (ii) would differ if the conventional with profits policies were written in a fund where the policyholders were entitled to 90% of the surplus within the fund and the shareholders entitled to 10% of the surplus within the fund. [3]
[Total 12]

5 A life insurance company currently sells conventional without profits annuities. It is considering also offering a new unit-linked annuity contract.

Instead of making periodic payments of a fixed amount of cash to the annuitant, the company will make the periodic payments that are the value of a fixed number of units in a unit-linked fund offered by the company. Each successive annuity payment will vary as the unit price varies between payments, but will always be the value of the fixed number of units.

The number of units that defines each annuity payment is set by the company at the outset and remains unchanged until the annuitant dies or switches funds.

The annuitant may only hold units in one unit-linked fund at a given time, but the annuitant can switch unit-linked funds at any time. The number of units defining the annuity payment is adjusted based on the unit prices of the two unit-linked funds at the date of any switch.

Discuss the advantages and disadvantages of the unit-linked annuity from the perspective of:

(i) the policyholder. [5]

(ii) the company. [8]
[Total 13]

6 A proprietary life insurance company sells a broad range of products and has recently projected significant future new business growth within its business plan.

The company is now reviewing its investment strategy in the light of the business plan.

(i) Describe how a model may be used to determine whether the current investment strategy remains appropriate for the company. [15]

(ii) Suggest other purposes for which the model could be used. [8]
[Total 23]

7 A large life insurance company, which already sells and administers a large range of life insurance products, is to start selling a new without profits whole life product designed to cover funeral expenses.

The new product would have a level sum assured and be available to policyholders between the ages of 55 and 80. There would be no medical underwriting, and the new product would only be sold via direct marketing.

Premiums are level, not reviewable, and would be paid monthly. Premium rates would be based only on the age of the policyholder. There would be no death benefit in the first year of the policy, with the sum assured paid on death at any point after the first anniversary of the plan. The policy would not offer a surrender value, and the policy would be cancelled with no value if a monthly premium is missed.

(i) Describe the additional risks that this new product will bring to this company. [16]

It has been suggested that two possible options are added to the product to improve marketability. These two options are:

(a) Policyholders can pay a lower monthly premium if they answer some simple medical underwriting on the application form;

(b) Policyholders can pay a higher fixed monthly premium and opt for a sum assured that increases annually with an appropriate funeral expense inflation index.

(ii) Assess how each of these options change the risks associated with this product. [12]
[Total 28]

END OF PAPER