

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

19 April 2011 (pm)

Subject CA1 — Actuarial Risk Management

Paper Two

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 before 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**
- (i) Outline how tax policy can be used to influence the demand for and provision of state benefits. [3]
 - (ii) Discuss ways in which a government can use the tax system to encourage individuals to make savings. [5]
- [Total 8]

2 In conjunction with a marketing promotion, a life insurance company has decided to offer a free one-year term assurance product to mothers of children born during a particular promotional period. The sum assured is £10,000 payable on the death of the mother if this occurs before the child's first birthday.

Application forms are included in a pack given to prospective new mothers.

- (i) Outline the assumptions that the life insurance company would need to make in order to evaluate the size of the risk being taken on. [2]
 - (ii) Discuss how the risks taken by offering this product can be managed. [6]
- [Total 8]

3 Describe, for each of the following investors, the characteristics of the investor's financial commitments or other objectives that would influence the type of assets they should hold (you do not need to consider the suitability of specific investments):

- (a) A childless middle-income couple both under age 30 who are saving for an extended round-the-world holiday.
- (b) An unemployed single parent who has just received a moderate lottery win in the form of a cash sum equal to six times his annual income. His annual income consists wholly of state benefits.
- (c) A 35 year old high net worth financial trader with a substantial income who is considering what to do with her annual bonus, which is equal to 40 times national average earnings.
- (d) An investment fund, targeted at wealthy individuals, that aims to generate significant returns from investing in commodities. The fund guarantees that the value of any individual's holding will be not less than 25% of the gross amount they have invested.

[16]

- 4** (i) Describe scenario analysis, stress testing and stochastic modelling. [4]

A large international insurance company has offered insurance to the agricultural sector for a number of years. With increasing concerns about the potential impact of climate change, the company is considering the ways it can improve its risk modelling.

The company has a large amount of data collected over ten years of providing this insurance. The format of the data varies between different territories.

- (ii) Discuss the suitability of each approach described in part (i) for the company's risk modelling. [8]
[Total 12]

- 5** (i) List six tools used in capital management. [3]

- (ii) Discuss, giving examples, how each of the tools listed in part (i) could be used by providers of financial products to manage their capital. [12]
[Total 15]

- 6** Over the last three months, the government of a large developed country has cut the rate of interest charged on the very short-term loans that it makes to the banking sector from 6% pa to 1% pa. Yields on other money market instruments have fallen in a similar way.

- (i) Discuss how this change may affect the interest rates charged on:
(a) Mortgage loans used to purchase domestic residential property.
(b) Balances outstanding on individual customers' credit card accounts. [10]

A large financial institution has a significant credit card business covering a wide range of personal customers in its domestic market. Different customers are charged different interest rates appropriate to their circumstances. Following the changes in short-term interest rates, the institution is reviewing the interest rates it charges to its credit card customers.

- (ii) Describe the process the credit card company would use to establish a revised interest rate charging structure. [6]
(iii) Discuss how the company will assess the effect of variations in experience. [5]
[Total 21]

7 A company which previously sold with profits life assurance directly through employed agents is now closed to new business. The company is collecting data in order to investigate its mortality experience.

(i) Explain why ideal data for this purpose may not be available. [2]

(ii) Discuss how the company can use the limited data it has collected. [4]

The company has publicly stated its commitment to treating its customers fairly.

(iii) Discuss why the company has made this commitment. [5]

In recent years bonus levels on the remaining in-force policies have fallen. Some policyholders have written to the company in response to these falls, to complain that they have not been treated fairly.

(iv) Outline the points the company may make in response to these complaints. [9]

[Total 20]

END OF PAPER