INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

21 April 2015 (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 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 Outline reasons why an individual may purchase life insurance that is not the most appropriate for their needs. [5]

2 A multinational group has recently acquired a subsidiary company that is based in a foreign country. The subsidiary sponsors a defined benefit pension scheme.

(i) List possible disclosure requirements for the multinational group's accounts in respect of the defined benefit pension scheme. [4]

Following the acquisition, the pension scheme has been closed to future benefit accrual. The multinational group's draft accounts show a materially different position in respect of the pension scheme, compared to what was shown in the subsidiary company's last set of accounts before the acquisition.

(ii) Outline possible reasons why the accounts show a materially different position. [4]

[Total 8]

3 A large bank is about to launch a new product designed for sophisticated investors. The product will involve direct investment in a number of markets, together with associated derivatives.

The bank also intends to offer an insurance policy linked to the new product so that investors who take out insurance will receive protection against large falls in the value of their holding in the new product.

When setting the premium rates for the insurance policy, the bank has used advanced stochastic techniques to model a range of financial outcomes. This model is only accessible to and understood by a small specialist team within the bank and is therefore treated as a "black box" by all others in the bank.

The results of the model suggest that the bank will be able to invest the insurance premiums in such a way that the invested premiums will be almost certain to meet any claims. The Chairman of the bank interprets this to mean that this insurance policy can, in effect, achieve guaranteed profits.

Discuss why it may not be appropriate for the Chairman to accept the results of the model in this way.

[9]

4 (i) (a) Define longevity risk.
(b) Explain why an individual might want to transfer this risk. [2]

(ii) List the four main providers of benefits to an individual [2]

(iii) Describe how these providers can help individuals by sharing the financial risks associated with longevity, commenting on how effective these mechanisms might be for transferring longevity risk over the next fifty years. [7]

(iv) Suggest how longevity risk for a defined benefit pension scheme might be transferred within the alternative risk transfer market, explaining why investors might wish to accept this risk. [3]
[Total 14]

5 A bank is about to set up a new subsidiary company that will sell life insurance products.

(i) Outline why a new life insurance company will need capital. [6]

(ii) Explain why the bank's insurance subsidiary will need separate capital from its parent company. [2]

(iii) List four ways the bank could fund the subsidiary's capital requirements. [2]

(iv) Describe how a regulator might set a minimum capital threshold for the subsidiary. [3]

Five years later the subsidiary's capital has fallen below the required threshold agreed with the regulator.

(v) Describe the actions that the regulator can take to address this situation. [4]
[Total 17]

6 An insurance company intends to offer a contract to individuals who are currently ill. The insurance company will pay medical and care costs relating to the current illness in return for an initial single premium.

(i) Discuss the risks that the company would be taking on. [8]

(ii) Discuss how the underwriting process could be used to assess/price the risks. [7]

(iii) Describe other management tools that the company could use to control these risks. [4]
[Total 19]

7 An insurance company is to provide insurance for passengers travelling through a new city airport which opened six months ago.

The premium for the insurance policy will be paid by the airport at no cost to passengers. This is an incentive to encourage passengers to travel through this airport, rather than travelling through nearby alternative airports which have been established for some time.

The airport has considered the risks which could be covered by the insurance policy and decided that the following risks will be covered:

1. Indemnity for the loss of, or damage to, luggage for every passenger, if it occurs at the airport, up to a maximum payout of $10,000 for each passenger.

2. A payout of up to $100,000 on death or injury if there is an aircraft "incident" on flights arriving at, or departing from, the airport.

(i) List other risks which could have been covered under this insurance policy. [3]

(ii) Describe possible sources of data, and their limitations, for the risks of luggage being lost or damaged. [6]

(iii) Outline how the insurance of luggage being lost or damaged could be priced, assuming that detailed credible data was available. [10]

(iv) Discuss reasons why providing this insurance cover may not encourage passengers to fly from the airport. [4]

(v) Explain how the low likelihood risk of a plane with over 300 passengers on board crashing at the airport could be managed by the insurance company. [5]
[Total 28]

END OF PAPER