EXAMINATION

19 April 2010 (am)

Subject CA1 — Actuarial Risk Management

Paper One

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 six 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 Outline the key requirements of a model that will be used to assess the variability of an outcome that depends on uncertain future events. [5]

2 (i) List the roles that a national government can play in the provision of benefits to individuals. [3]

A government is concerned about the increasing costs of providing retirement benefits for government employees.

(ii) Describe how the government could reduce these costs. [7]
[Total 10]

3 A farmer is considering installing a wind turbine on his farm to generate power.

(i) Outline the information that will be needed in order to calculate the internal rate of return on this project. [5]

(ii) Describe two other cash flow projection methods which can be used to assess the viability of this project. [4]

The results of the cash flow projections show that the project is financially viable.

(iii) Discuss the other factors which should be considered before deciding on whether to go ahead with this project. [5]
[Total 14]

4 An individual in a particular country is looking to set up a self-invested individual pension arrangement (IPA).

The regulations in the country concerned allow the individual to select the assets to be held within the IPA. There are no restrictions on the assets that the investor could include within the IPA. However, the assets cannot be transferred out of the IPA until the minimum retirement age of 60 is reached.

(i) List the potential asset classes that the individual could invest in. [5]

(ii) State the criteria that would be used to determine whether a particular asset class would be appropriate for the investor. [2]

(iii) Discuss the suitability of each asset class for a 55 year old individual considering investing in an IPA. [10]
[Total 17]

5 (i) State how the following asset classes could be categorised:

(a) domestic equities
(b) domestic bonds [4]

(ii) Explain why a fund that invests in domestic equities may use analysts who specialise by industrial sectors. [5]

(iii) Outline the drawbacks of the approach in (ii). [2]

(iv) Explain why the proportion of an equity fund held in cash may have increased significantly over a twelve month period. [5]

(v) Outline why investment funds may use derivatives. [2]

(vi) Describe the difference between an active and a passive investment approach for equity investment funds. [4]
[Total 22]

6 A mutual life insurance company has a large number of policyholders and a significant undistributed surplus. This undistributed surplus has built up over many years.

(i) Outline how the undistributed surplus may have arisen. [5]

(ii) List the data required to calculate the value of the provisions needed for the in-force policies. [4]

(iii) Outline why the data used to determine these provisions would be grouped. [2]

(iv) Explain the considerations that should be taken into account when validating the grouping of the data. [4]

The company intends to demutualise and become a limited liability company. On demutualisation, the undistributed surplus is to be distributed to the policyholders in the form of both additional benefits and shares in the limited company. The distributed shares will provide the company with capital.

(v) Explain why the company needs to retain some of the surplus as capital. [6]

(vi) Discuss the considerations to be taken into account in determining the split between the additional benefits and the shares. [6]

(vii) Discuss how the distribution of future surplus would change following the demutualisation. [5]
[Total 32]

END OF PAPER