INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

20 April 2015 (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 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 A country has recently set up a new regulator of occupational benefit schemes, following public concern over some cases where occupational benefit schemes have failed to provide benefits that had been promised to employees.

The regulator will have a wide range of statutory powers. It has announced that it will require all schemes to supply information about their assets and liabilities. The regulator will use this information to compare funding positions for all the different schemes and decide what (if any) further action to take in each case.

Outline the advantages and disadvantages to the regulator of using a standard model in order to compare schemes for this purpose. [6]

2 A charity is being established to raise funds for a range of community groups within a small town. The charity will have a board of trustees, and it will run a number of fundraising events throughout the year.

Describe the types of insurance covers that could be suitable for the charity. [6]

3 A large closed defined benefit pension scheme, with assets of €400 million, in a developed country is in deficit and is currently reviewing its investment strategy. The scheme's liabilities are roughly split half for pensions in payment and half for non-retired members averaging ten years to retirement age. Pensions in payment are indexed in line with price inflation.

Discuss the characteristics and suitability of including each of the following assets in the investments of the scheme. All would involve a one-off investment of €20 million.

(i) A unit trust fund that predominately invests in the emerging market economies.

(ii) A portfolio of rental flats in the country's capital city.

(iii) A share of income from electricity generated by solar panels that have been installed on residential houses near the country's capital city.

(iv) A 25% stake in a company that trades in antique stamps.

[12]

4 Space Tourism plc has been developing a space travel programme for members of the public. It will have large operational costs, and fuel will be a high proportion of these costs. In recent years the cost of fuel has increased and the volatility of the fuel price has also increased. To protect against these rising fuel prices and volatility, Space Tourism has bought fuel price futures.

(i) Explain why Space Tourism has bought these futures. [2]

(ii) Discuss the reasons why futures may not be fully effective in meeting Space Tourism's objectives. [3]

(iii) Outline how the futures exchange could manage its risk exposure. [6]
[Total 11]

5 Explain the principal influences on:

(i) Short term interest rates. [7]

(ii) The relative levels of government and corporate bonds yields. [13]
[Total 20]

6 For several years an insurance company has sold a whole life policy with level annual premiums. The policy pays out a fixed sum on the policyholder's death. On surrender after at least 15 years in-force a surrender value becomes payable – the surrender value never exceeds 10% of the sum assured.

(i) Discuss the risks the insurance company is exposed to over the whole period of the contract. [7]

A number of investment funds have recently started offering to buy these policies from policyholders in exchange for a lump sum. The funds would take over the policy: pay premiums to the insurance company and then collect the death benefit in due course when the policyholder dies.

(ii) (a) Set out why an investment fund might offer to buy these policies.

(b) Discuss how a fund could determine the amount to offer for a policy. [10]

New regulations are about to be introduced forcing insurance companies to notify policyholders that investment funds may offer them a higher value than the surrender value.

(iii) Discuss the impact on the insurance company of this change in regulation. [3]
[Total 20]

7 A mutual life insurance company sells only annuity business.

(i) Describe the basic features of a model which projects the company's solvency position over the next 20 years. [7]

(ii) Describe why the company may carry out an analysis of the change in its surplus. [8]

(iii) Discuss which capital management tools may be suitable for the company. [10]

[Total 25]

END OF PAPER