EXAMINATION

30 September 2010 (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 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 An insurance company is considering introducing a health insurance policy, which will cover the cost of medical treatment. Premiums will be payable annually.

The policy will incorporate a guarantee such that premiums will be maintained at the existing rate if no claims have been made in the previous year.

Discuss the main considerations that will need to be taken into account when determining the appropriate premium to charge. You do not need to consider issues relating to expenses or investment returns and strategy. [8]

2 (i) Set out the main steps needed to identify and clarify the particular risks inherent in a project. [6]

A waste management company has decided to expand the range of its services. It is about to enter into contracts to transport and dispose of low-level radioactive waste.

The company is concerned about the financial consequences of accidents during transit or at the disposal site.

(ii) Explain why traditional insurance products may not be appropriate for mitigating these risks. [2]

(iii) Outline alternative approaches to mitigation that could be more appropriate.[2]
[Total 10]

3 In a developed economy, approximately 80% of the population own their own homes. The vast majority of house purchases are financed using mortgages with repayments typically being made over (or at the end of) 20 to 25 years.

A measure of house prices is known as the House Price Multiple (HPM), which is the ratio of the average house price compared to average earnings. Traditionally, the HPM has been around four. Over the last three years, the HPM has risen to around six.

Over the same period, interest rates on mortgages and the level of personal savings in the economy have been at historically low levels.

(i) Describe the risks to the economy that could arise as a result of this increase in the HPM. [7]

(ii) Explain the difficulties that the authorities could face if they try to reduce the HPM. [5]
[Total 12]

4 A large general insurance company writes a significant volume of personal insurance business. The company is considering introducing a new pet insurance policy.

(i) List the risks that the pet insurance policy is likely to cover. [3]

(ii) Discuss how to categorise and load for expenses when pricing a new general insurance product. [8]

It has been suggested that only marginal expenses are used for the purpose of pricing the new pet insurance policy.

(iii) Discuss this approach. [3]
[Total 14]

5 The annual gross redemption yield (GRY) on a conventional bond can be expressed as: GRY = risk free real yield + expected inflation + inflation risk premium + bond risk premium

(i) (a) State the equation that defines the yield gap traditionally used to compare the relative values of conventional government bonds and equities.

(b) Show how this equation can be expressed so as to give an indication of the market's view of the relative riskiness of equities compared to conventional bonds.
[3]

The GRY's on two corporate loan stocks with similar features (including currency, term and coupon) issued by companies A and B are 5.5% and 6.0% respectively.

(ii) Explain why these bonds might have different redemption yields. [4]

(iii) State the principles of investment. [2]

An insurance company writes a large volume of immediate annuity business. The company is considering using the GRY's on a notional portfolio of conventional bonds for the investment return assumptions it uses in its pricing basis for this line of business.

(iv) Describe how the notional portfolio could be chosen. [6]

(v) Discuss the potential problems resulting from using a notional portfolio for such pricing purposes. [4]
[Total 19]

6 An industrial company employs 500 people. It currently operates a defined benefits pension scheme for its employees.

The company has decided to close this scheme for future service. From a given date, existing employees (and any subsequent new employees) will be invited to join a new defined contribution pension scheme. They will contribute the same amount to the new scheme as they do currently (or would have done) to the existing scheme. The employer will also contribute to the new scheme. Benefits in respect of service prior to the closing date will continue to be paid from the existing scheme under the rules and terms and conditions currently in force.

(i) Describe the potential risks faced by the employer in providing a defined benefits scheme, which could have influenced the decision to close the current scheme. [8]

(ii) Discuss why the proposed changes might cause industrial relations problems. [7]

(iii) Set out the contents of the documentation that the company would be expected to provide to employees in relation to the new scheme. [5]

(iv) Outline the considerations that should be taken into account when preparing this documentation and any other ongoing communications with employees. [7]

The contributions payable into the new scheme are to be invested in the units of one of five managed funds provided by an insurance company. Each employee can choose which one of the five funds "their" contributions will be allocated to. In practice, most employees opt for the domestic equity fund.

Five years after the commencement of the new scheme, the unit price of the domestic equity fund has fallen by 25%.

Representatives of the employees have approached the employer's management to express their concerns. They argue that the fall in the unit price means that many employees are receiving or can expect to receive benefits that are considerably lower than those they were led to believe would be provided. To make up the shortfall, the representatives want the employer to make an additional one-off contribution and/or to increase future contributions payable in respect of all affected employees.

(v) Discuss the points the employer should make when responding to this request.

[10]
[Total 37]

END OF PAPER