

# INSTITUTE AND FACULTY OF ACTUARIES



## EXAMINATION

19 April 2017 (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 must not start writing your answers in the booklet until instructed to do so by the supervisor.*
3. *You have 15 minutes of planning and reading time before the start of this examination. You may make separate notes or write on the exam paper but not in your answer booklet. Calculators are not to be used during the reading time. You will then have three hours to complete the paper.*
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** An individual has received an inheritance and has £500,000 to invest. He is interested in investing in the property market and particularly in accommodation available for students to let. The following three investments have been suggested:

- (a) a house that can be let to a group of students
- (b) a number of rooms in high quality purpose-built student accommodation that are maintained to a high standard
- (c) a fund that invests in and manages a number of student halls of residence

Discuss the characteristics and suitability of these three investments. [9]

**2** A manufacturer of fireworks is currently assessing the risks it is exposed to:

(i) Outline these risks. [3]

(ii) Discuss the circumstances that might lead to a risk:

- (a) not needing financial coverage.
- (b) being retained (taken on by the manufacturer).
- (c) being fully transferred.
- (d) being partially transferred.

[4]

(iii) List six insurance products that could be used to assist in some of the risks being partially or fully transferred. [3]

[Total 10]

**3** A regulator in a country requires assets in occupational benefit schemes to be valued on the following basis:

- 80% of market value for all assets which are quoted on an active market
- assets which are not quoted are inadmissible

(i) Suggest why this approach might have been adopted. [2]

(ii) Comment on the disadvantages of this approach. [4]

The regulator has decided to change its policy to allow an application from a benefit scheme to use an alternative method to value its assets. The method will need to relate the value of the assets to the value of the liabilities.

(iii) Discuss the methods that could be proposed for the valuation of assets. [6]

[Total 12]

- 4** The regulatory regime for employer sponsored defined benefit pension schemes in a developed country allows the trustees of a scheme to set their own funding level.
- (i) List six main assumptions that will be needed. [3]
  - (ii) Discuss why different schemes might use different assumptions in setting their funding level. [11]
- [Total 14]
- 5** A country is designing a new scheme to protect policyholders in the event that a provider of benefits becomes insolvent or is unable to meet its capital requirements.
- (i) Describe how the costs of the protection scheme could be met. [5]
  - (ii) Discuss the issues that need to be considered in designing the protection scheme which will need to provide a balance between the beneficiaries' interests and the costs of the protection scheme for each of the following:
    - (a) a range of long-term term assurance contracts
    - (b) savings contracts providing a minimum guaranteed annual return
    - (c) compulsory medical insurance contracts
    - (d) a staff defined benefit scheme
- [10]  
[Total 15]
- 6** A sports club from a small town has, for the first time in its history, reached the later stages of a high profile national cup competition.
- The remainder of the competition consists of seven well attended rounds and a prestigious final at the country's major sports stadium.
- (i) Set out the various sources of the revenues the club may receive from its continued participation in the competition. [2]
- The club have decided to securitise part of their future revenues. Three quarters of the revenues from specified sources will be given to investors as and when they arise. In return, the investors will pay the club a cash sum before the next stages of the competition start.
- (ii) Explain why the club may have chosen this approach and the risks it may face. [6]
  - (iii) Discuss how the price to be charged to investors would be determined. [7]
  - (iv) Identify the type of investor that this opportunity might appeal to. [2]
- [Total 17]

**7** An insurance company is considering launching a new health insurance product.

- (i) Outline how each of the components of the actuarial control cycle could be used to manage the launch of the new product. [8]
- (ii) Outline the main aspects of the external environment to be considered for the new product. [5]
- (iii) Discuss how the expenses could be allocated when pricing this new product. [6]

The insurance company has decided to use the model prescribed by the regulator to calculate statutory solvency for reserving for the new health insurance product.

- (iv) Suggest reasons why the company has decided to use this model rather than building its own internal model. [4]
- [Total 23]

**END OF PAPER**