

# INSTITUTE AND FACULTY OF ACTUARIES



## EXAMINATIONS

30 September 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** Describe how mean-variance portfolio theory can be extended to take account of an investor's liabilities. [6]
- 2** An actuarial consultancy is giving advice to a life insurance company that is designing a retirement income product for customers.
- (i) (a) List the stakeholders who could be affected by the actuarial advice.  
(b) Outline how the advice could affect the listed stakeholders. [6]
- (ii) Outline the information about the life insurance company that should be sought in order to be able to give advice. [3]  
[Total 9]
- 3** (i) Define:
- (a) liquidity risk.  
(b) operational risk. [2]
- (ii) Describe how the following companies can manage the risks defined in part (i):
- (a) a general insurance company that specialises in pet insurance.  
(b) a global airline company.  
(c) a property unit trust. [9]  
[Total 11]
- 4** (i) Explain the meaning of net asset value per share in the context of equity investment. [3]
- (ii) Assess the usefulness of net asset value per share, as shown in the accounts, as a means of deciding whether or not to purchase shares, quoted on a major exchange, in the following companies:
- (a) an advertising agency  
(b) a mineral extraction, e.g. mining company  
(c) an industrial manufacturing company [11]  
[Total 14]

- 5** (i) State the objectives of and requirements for building a model. [6]

Helen believes that she can generate sufficient profits from betting on the results of sporting events to pay for her day to day living expenses.

She has identified that a model needs to be built to analyse past data and use this to predict future results.

- (ii) Describe the decisions that need to be made when determining the modelling approach to be taken to assess these future results. [6]

- (iii) Outline the characteristics of the cashflows which need to be incorporated into the model. [4]

[Total 16]

- 6** (i) List the reasons why a health insurance company might want to analyse its financial results. [5]

- (ii) Outline possible sources of surplus for a health insurance company. [4]

A health insurance company has made losses over the last few years and its solvency position has deteriorated.

- (iii) Explain the actions that it could take to reduce the deterioration in this company's solvency position. [13]

[Total 22]

- 7** (i) List the main uses of data by a financial institution. [4]

A funeral director has provided funeral services in a large city for a number of years. It provides these services through the sale of funeral cost plans, which it only offers directly to individuals.

Under the funeral cost plans individuals pay regular premiums to the funeral director over a period of ten years, or until death if sooner. From the time the funeral cost plan is taken out it guarantees that whenever the individual dies the funeral services will be paid for.

If an individual stops paying premiums while still alive before the ten years is up then the funeral cost plan is cancelled. No payment is made to the individual if the funeral cost plan is cancelled.

- (ii) Describe the data that will be required to set premiums for these funeral cost plans. [10]

- (iii) Compare the data requirements for an insurance company offering whole life assurance policies nationally with those for these funeral cost plans. [8]

[Total 22]

**END OF PAPER**