

# INSTITUTE AND FACULTY OF ACTUARIES

## EXAMINATION

24 April 2023 (am)

### Subject CP1 – Actuarial Practice Core Practices

### Paper Two

Time allowed: Three hours and twenty minutes

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator.

If you encounter any issues during the examination please contact the Assessment Team on T. 0044 (0) 1865 268 873.

**1** A country with a population of 50 million people has a small town with 50,000 inhabitants located on an island situated a short distance from the mainland. The only connection that the island has to the mainland is one bridge that is now over 50 years old. The road that connects the town on the island to the mainland passes mainly through an important habitat for birds that has been subject to increasing environmental protections over the last 50 years.

The local government for the town recognises that the road and bridge are a critical link between the island and mainland. The maintenance of both the road and bridge is a priority for the local government; however, the connection to the mainland must always be operational. Maintenance of the bridge is typically planned at least 2 years in advance considering the age of the bridge, operational requirements and the local government's financial resource constraints. Occasionally, there will be a need to carry out emergency maintenance on the bridge.

Until 10 years ago, coastal sea flooding of the road from the town to the mainland was very rare. However, in the last 10 years, the frequency and severity of storms that cause flooding and other damage to the road have increased. On one recent occasion, a severe storm and associated coastal flooding caused damage to both the road and bridge, making them unavailable for a week.

The local government has proposed to engage an actuary to undertake a review of its transportation road and bridge link with the mainland. The review will consider the island's infrastructure requirements and assessment of risks for its link with the mainland for the next 50 years, including considering climate change risk.

Currently the local government pays for maintenance costs of the road and bridge link as they arise. A suggestion has been made that a 20-year fixed-cost maintenance contract could be set up to manage the risks and cost of maintaining the road and bridge.

- (i) List the stakeholders who will be part of the transportation review. [6]
- (ii) Describe three potential conflicts of interest that could arise between the stakeholders identified in part (i). [3]
- (iii) Set out the factors, including any further investigations, an actuary would need to consider before agreeing to undertake this review. [7]
- (iv) Describe the possible risks that the actuary should consider in their review. [9]
- (v) Suggest four possible actions to mitigate the risks identified in part (iv). [4]
- (vi) Discuss the possible issues with using a model that assesses the impact of climate change in the review. [5]
- (vii) Assess the suitability of a 20-year fixed-cost maintenance contract for the road and bridge link. [11]
- (viii) Discuss other possible ways that the government could fund the maintenance contract. [5]

[Total 50]

- 2 A developed country has an established and sophisticated insurance market. Insurance companies use advanced pricing and underwriting approaches when writing their business. Many insurance companies operate in the country. A wide range of products are available to individuals and businesses.

The government of the country is concerned that it is becoming more difficult for people living in relative poverty to access or afford the insurance products they need. The government is conducting research to find out why this is the case and what actions can be taken to ensure people living in relative poverty can access and afford insurance products.

An insurance company operating in this country offers a wide range of products. It has recently rebranded and is now operating as an ethical insurance company. It is introducing new ethical principles to the way it operates, the products it offers and the investments it holds. The insurance company is keen to work with the government on providing more affordable products.

- (i) List six types of insurance products an individual may need to purchase. [3]
  - (ii) Discuss why the cost of insurance may be more expensive for those living in relative poverty. [11]
  - (iii) Explain why the government may be concerned about citizens living in relative poverty finding it difficult to access and afford the insurance they need. [6]
  - (iv) Describe the actions that the government could take to enable these citizens to access and afford insurance. [11]
  - (v) Discuss possible ways an insurance company could ensure the products it offers are ethical. [8]
  - (vi) Discuss how rebranding as an ethical company will affect the investments the insurance company holds. [7]
  - (vii) Suggest how the ethical insurance company could provide insurance products to help those living in poverty to access the insurance they need. [4]
- [Total 50]

**END OF PAPER**