INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

16 September 2022 (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.

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1 Five years ago, the government of a developing country (Country M) allowed the first insurance company (Company N) in its country to begin operating. Company N is a proprietary insurance company based in Country M and has not employed any Actuaries since it was set up.

The government of Country M also made it compulsory for all employers in the country to provide some form of pension provision for their employees.

The government of Country M has set the following objectives for the next 5 years, which are to:

- increase competition for insurance products in Country M.
- increase pension provision awareness for citizens of Country M.
- reduce climate change in Country M.
- improve the care provision for older citizens in Country M.

In order to meet these objectives, the government of Country M is considering implementing the following proposals:

Proposal A

To increase competition in the life insurance industry in Country M, the government of Country M is considering initially allowing one further insurance company who would operate alongside Company N with the following options being considered:

- Option X – Launch a state-backed life insurance company.
- Option Y – Authorise another domestic private company.
- Option Z – Invite existing overseas life insurance companies to apply to set up a subsidiary life insurance company in Country M. Several companies are expected to apply.

Proposal B

To improve awareness of pension provisions, the government of Country M will set up a website that will allow citizens of Country M to gather data about all of their pension savings, both from the state and their employers, and enable them to project their total expected pension at any given retirement date.

Proposal C

As part of its efforts to reduce climate change, the government of Country M will issue a fixed interest bond. The money raised by the government from the bond issue will be used for projects designed to reduce future carbon emissions by vehicles and households.

Proposal D

To improve the health care provision in Country M, the government of Country M will require all citizens of the country to purchase compulsory health care insurance with one of the insurance companies.

The government of Country M will also impose a new stricter solvency regime. The new solvency regime will require insurance companies to hold additional capital sufficient to prevent insolvency in all but the most adverse 0.3% of scenarios. This is higher than the standard used in many other countries, where insurance companies will commonly be required to hold additional capital sufficient to prevent insolvency in all but the most adverse 0.5% of scenarios.

(i) List the main difficulties that Company N may have faced in the first 5 years, resulting from a lack of actuarial knowledge. [5]

(ii) Suggest possible reasons why the government is looking to expand the domestic life insurance industry in Country M. [5]

(iii) Discuss the factors the government is likely to consider in deciding which of options X–Z to adopt. [6]

(iv) Suggest possible ways that a company – applying under proposal A, option Z – could seek to ensure that they are the life insurance company selected by the government. [5]

(v) Explain the reasons why the government would want to set up the website for proposal B. [6]

(vi) Discuss the issues involved in gathering and storing data about pension savings on a website, both from the viewpoints of the government and its citizens. [6]

(vii) Outline how the insurance companies in Country M could assist in improving pension provisions for the government. [5]

(viii) Outline the types of institutional investor that may be interested in the government bond for proposal C. [3]

(ix) Discuss reasons why an institutional investor would want to purchase this government bond. [5]

(x) Outline the types of cover that the insurance company will need to provide for the health care insurance. [3]

(xi) Discuss the risks of a health care insurance product for Company N. [3]

(xii) Describe how the insurance company could mitigate the risks covered under part (xi). [3]

(xiii) Discuss the likely effectiveness of imposing a higher solvency standard for insurance companies. [5]

[Total 60]

2 A private company has been awarded a contract by the government of a developed country (Country Y) to build and operate Country Y's first national aquarium ('the aquarium').

The aims of the aquarium are to:

- gain an international reputation.
- be a tourist attraction.
- breed, and subsequently release back into the wild, rare and endangered fish.

Based on its intention to honour all of the aims, the company has just been granted permission by the government of Country Y to be the sole provider of the aquarium.

The company has asked an Actuary for advice on certain aspects of this project.

In particular, the company would like advice on how to achieve the aims of the aquarium while maximising its return on capital.

The company first needs to decide on a location for building the aquarium. It will then put in place a team to take responsibility for the construction and subsequent day-to-day running of the aquarium. The company still needs to decide on the precise mix of activities to be undertaken by the aquarium, once opened.

(i) Outline the issues to be considered in choosing a suitable location for the aquarium. [6]

(ii) Suggest possible types of insurance that the aquarium may require. [3]

Assume that the company has now purchased the land on which they will be able to build the aquarium. The company is now seeking advice on the financial impact of the possible activities to be undertaken by the aquarium, once opened.

(iii) Suggest the main activities that the aquarium could choose to undertake, and the cashflows that would be associated with each activity. [6]

(iv) Outline the risks that the private company will have in building the aquarium and then subsequently the activities mentioned in part (iii). [5]

(v) Suggest possible actions that the aquarium could take to mitigate the risks mentioned in part (iv). [5]

(vi) Describe the modelling that could be undertaken to decide on the optimum mix of possible activities. [6]

(vii) Discuss how the aquarium could be funded, both for the building of the aquarium but also the ongoing running of the activities set out in part (iii). [6]

(viii) Discuss, from the point of view of the company, possible methods it could use to remunerate the Actuary for the advice. [3]

[Total 40]

END OF PAPER