Subject SP1

CMP Upgrade 2021/22

CMP Upgrade

This CMP Upgrade lists the changes to the Syllabus objectives, Core Reading and the ActEd material since last year that might realistically affect your chance of success in the exam. It is produced so that you can manually amend your 2021 CMP to make it suitable for study for the 2022 exams. It includes replacement pages and additional pages where appropriate.

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We only accept the current version of assignments for marking, *ie* those published for the sessions leading to the 2022 exams. If you wish to submit your script for marking but have only an old version, then you can order the current assignments free of charge if you have purchased the same assignments in the same subject in a previous year, and have purchased marking for the 2022 session.

This CMP Upgrade contains:

- all significant changes to the Syllabus objectives and Core Reading
- additional changes to the ActEd Course Notes and Assignments that will make them suitable for study for the 2022 exams.

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1 Changes to the Syllabus

This section contains all the ***non-trivial*** changes to the syllabus objectives.

An additional bullet point has been added to the end of Objective 3.1 as follows:

3.1 Assess how the following can be a source of risk to a health and care insurance company:

- data
- claim rates
- claim amounts
- investment performance
- expenses and inflation
- persistency
- mix of new business
- volume of new business
- guarantees and options
- competition
- actions of management
- actions of distributors
- counterparties
- legal, regulatory and tax developments
- reputation
- internal audit failures/fraud
- physical risks
- aggregation and concentration of risk
- catastrophes
- non-disclosure and anti-selection.
- **climate risks.**

2 Changes to the Core Reading

This section contains all the ***non-trivial*** changes to the Core Reading and associated ActEd text.

Chapter 1

Section 1.3

An additional clause has been added to the final paragraph of the section on 'Underwriting and claims management'. It now reads:

These difficulties present even more opportunities than usual for actuaries to become involved in multi-disciplinary teams with non-actuaries, <u>including experts outside the insurance industry such as medical experts</u>. While a detailed knowledge of other disciplines, such as underwriting and claims, is not essential, it is useful for the actuary to be aware of the standard approaches in the industry.

Chapter 6

Section 1

The following sentence (and associated ActEd text) has been added to the end of the section:

Recently health and care insurers have begun to offer contracts that encourage and reward better health of the individual, for example through rewards or lower premiums, to attract customers.

Such rewards might include a free weekly drink from participating providers, cinema tickets, subscriptions / memberships to various services, and cashback on certain (usually healthy) purchases from certain retailers.

Chapter 7

Section 1.1

A new section has been added on 'Environmental, social and governance (ESG) considerations'. A replacement page is attached.

Section 3.1

Two sentences have been added in the 'Problems in pricing the benefits' section. It now reads:

So, as the product (and the definitions used) continues to evolve, relevant data will remain scarce in the future.

<u>However, medical research can help understand these underlying issues</u>.

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There will be many overlaps between related illnesses that will make pricing more complex and the picture for the policyholder more confusing. The cross-correlation between diseases will give rise to greater potential for disallowed claims and customer dissatisfaction at various levels of proportionate benefit. In some countries, comorbidities are becoming more common.

Chapter 8

Section 4.1

An additional sentence has been added to the end of the section as follows:

There may also be generational differences between sub-groups of policyholders in their views on, and ways of buying insurance.

Chapter 9

Section 2.5

A new section has been added on 'Climate change and regulation'. A replacement page is attached.

Chapter 12

Section 3.3

An extra sentence has been added and this paragraph now reads as follows:

Population cohort studies have been carried out for decades in many countries and can provide additional and detailed analysis of people's health experiences whilst considering key variables. These data are often readily available (in many territories) and are often free. The numbers involved make them credible.

Section 6

A new section has been added (and an additional bullet point 'medical journals' has been added to Section 6.1) as follows:

6.3 Medical journals

Medical journals that have been suitably peer reviewed may be available in some territories and may provide some additional insight.

Examples of such medical journals include the British Medical Journal and the Journal of the American Medical Association.

Chapter 24

Section 5.8

A new section has been added on 'Climate change'. A replacement page is attached.

Chapter 27

Section 1.2

The third paragraph on page 5 has been expanded to read:

The last three sources will usually involve additional expense for the insurance company. Hence the extent to which they are used in a particular case depends on the extent of the loss that the insurer will make if it misestimates the state of health of the applicant. Advances in technology mean that in some territories it may be possible for the insurer to access health records electronically, speeding up the application process significantly.

Chapter 31

The following two definitions have been added to the Glossary:

Comorbidity

Comorbidity is where an individual has more than one disease or condition present at the same time. Conditions described as comorbidities are often chronic or long-term conditions. An example of comorbidity is that an individual with arthritis could commonly have other chronic conditions, such as diabetes or heart disease.

Nudging

A health insurance company can use rewards and non-financial benefits to encourage positive customer behaviour. For example, where customers can provide evidence that they are taking actions to keep healthy, then the insurer could offer lower premiums or other non-financial benefits *eg* a free coffee every month. This can be a win for the individual and health and care insurer.

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3 Changes to the ActEd material

This section contains all the ***non-trivial*** changes to the ActEd text.

Chapter 0

Section 1.1

The overview of Chapter 31 has been amended as follows:

Chapter 31	This is the Glossary. It is advisable to familiarise yourself with the glossary terms as you work through the course, so that you have a good understanding of each of them when they are used in the Course Notes and in questions.

Chapter 7

Section 6

The following paragraph has been added to the end of the section:

Regulators also have a role to play in ensuring that the financial system is resilient to the damage that might be caused by climate change, and indeed, how the financial system can contribute to the transition to a low-carbon economy. While this may not currently be the regulators' main priority, it is growing in importance, and is likely to become a more significant focus in the future.

Summary

On page 23, the first bullet point has been expanded to read:

- customer acceptability – the product must be clear about both the benefits provided and the amounts and variability of premiums; it must meet customer needs and/or provide some element of customer gain; it must be acceptable in terms of sustainability

Solution to Practice Question 7.3

Two points relating to ESG have been added to the solution – one paragraph and one bullet point in the final list:

Shareholders are also likely to be concerned that the company is being run in an environmentally sustainable, socially responsible and well-governed manner. (This may be due to their own conscience on these issues or a fear of poor publicity – and the resulting effect on the share price – if the company is not acting responsibly.)

Hence the shareholders will want to:

- be satisfied that all the products have an acceptable balance between risk and return
- have confidence that the management is competent
- be assured that the company is being run with ESG considerations integrated into its core.

Solution to Practice Question 7.6(ii)

A bullet point relating to ESG has been added to the end of the bullet list:

- consideration of sustainability issues. [½]

Chapter 9

Summary

The following list has been added to the end of the section on 'The regulatory regime':

Regulations are under development that aim to limit the impact of climate change. Specific aims of the regulation may relate to:

- climate risks in business decision making and strategic planning
- disclosure of climate-related risks and opportunities
- assessing, pricing and managing climate-related risks
- incorporating ESG factors into investment management decisions
- incorporating financial risks from climate change into risk management processes.

Chapter 12

Section 0

The final bullet point in this section has been expanded to read:

- other sources (medical journals, trade magazines, actuarial consultants, overseas data and rate table software).

Summary

The following sentence has been added under the section on 'Sources of data':

Medical journals – these may provide additional insight.

Solution to Practice Question 12.4

The following (underlined) point has been added to the solution:

Some use might be made of any national statistics on illness or on sickness absence in the overseas country, … [½]

… or medical journals published in the overseas country. [½]

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Chapter 24

Summary

A section has been added on climate risks as follows:

Climate change

Climate change risks could arise from adverse changes in the physical environment and secondary impacts in the economy.

Climate risks for financial companies are categorised as:

- physical risks
- transition risks
- liability risks.

Solution to Practice Question 24.2

The following (underlined) point has been added to the solution:

Equity investment represents a higher risk, but this may not be perceived as a serious problem for long-term investment, … [½]

… however, the long-term nature of these investments increases the insurer’s exposure to the impact of climate change. [½]

Chapter 28

Section 2

The following paragraph has been added at the end of the section:

In addition to the principles described above, the company should also consider environmental, social and governance (ESG) issues when setting its investment strategy, as described in earlier chapters. For example, the impact of climate change could affect both the expected return from an investment and its risk.

Solution to Practice Question 28.8

The following (underlined) point has been added to the end of the solution:

Any publicly-stated intentions of investment strategy may need to be honoured, … [½]

… including the company’s policy on environmental, social and governance (ESG) issues, such as sustainable investment. [½]

Chapter 30

Section 3.7

A third bullet point has been added in the solution to the self-assessment question as follows:

- they will need to comply with regulation.

Chapter 31

Section 0

The first paragraph has been amended to read:

This chapter includes the Core Reading definitions with which you need to be familiar. These definitions are shown in a **different typeface**. You should not reproduce these word-for-word in the exam, but you must be able to express the ideas with equal precision in your own words.

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4 Changes to the X Assignments

Overall

The X Assignments have been changed significantly to reflect the online nature of the exams. We have not detailed all of the changes in this upgrade.

If you would like the new assignments *without* marking, then retakers can purchase an updated CMP or standalone X Assignments at a significantly reduced price. Further information on retaker discounts can be found at:

www.acted.co.uk/paper_reduced_prices.html

If you wish to submit your scripts for marking but have only an old version, then you can order the current assignments free of charge if you have purchased the same assignments in the same subject in a previous year, and have purchased marking for the 2022 session. We only accept the current version of assignments for marking, *ie* those published for the sessions leading to the 2022 exams.

Most of the changes to the X Assignments are in respect of three main things:

- regular updates to the Core Reading, with the main additions this year relating to environmental, social and governance and climate change
- a shift away from straightforward bookwork questions in light of the exam now being online
- a reclassification of questions according to the skill level (knowledge / application / higher-order) by use of command verbs.

More significant changes are listed below.

Assignment X1

Question and Solution 1.1

This question was straightforward bookwork and has been replaced by a similar but more applied version. Replacement pages are attached.

Solution 1.2(i)

The following point has been added to the end of the solution (to reflect the 'discuss' command verb):

A possible disadvantage of pre-authorisation is that it could result in delays in policyholders getting urgent treatments. [½]

Question 1.4(ii)

This part is testing higher-order skills, so the command verb(s) used has been changed and the question now reads:

(ii) Suggest a suitable health insurance product that may be purchased in order to alleviate or prevent the hardship arising from each event, indicating whether the product is likely to be traditional non-profit, unit-linked and/or inflation proofed. [4]

Solution 1.4(ii)

The following points have been added to the end of the solution:

The product is likely to be traditional non-profit. [½]

The cash-based (annuity) benefits may also be index-linked. [½]

Question 1.6(ii)

This part is testing higher-order skills, so the command verb used has been changed and the question now reads:

(ii) Discuss the advantages and disadvantages to an individual of joining a group insurance scheme rather than buying an individual policy. [2]

Question 1.7

This part is testing higher-order skills, so the command verb used has been changed and the question now reads:

Set out the features the actuary would need to consider, suggesting appropriate values for these, where relevant. [8]

Question 1.8(ii)

This part is testing higher-order skills, so the command verb used has been changed and the question now reads:

(ii) Suggest the types of guarantee that might be provided on individual income protection contracts. [5]

Assignment X2

Question 2.1

This part is testing application skills, so the secondary command verb used has been changed and the question now reads:

Explain the main problem for health and care insurance policyholders caused by inflation, outlining the various ways in which product design can help overcome it. [3]

Question 2.4(ii)

This part is testing higher-order skills, so the command verb(s) used has been changed and the question now reads:

(ii) Discuss ways in which the difficulties for either or both of the above commission structures might be reduced. [4]

Question 2.6

This part is testing higher-order skills, so the command verb(s) used has been changed and the question now reads:

<u>Set out</u> the regulatory restrictions that could be imposed on health and care insurance companies, <u>suggesting</u> how they help to achieve the stated aim of consumer protection. [9]

Solution 2.6

The following points have been added under the underwriting points:

- Restrictions on the rating factors that may be used in pricing, … [½]

  ... for example a prohibition on the use of age or gender. [½]

and the point relating to policyholder discrimination now applies to both the underwriting and (new) rating points and now reads:

<u>These restrictions on underwriting and rating</u> will help prevent policyholder discrimination. [½]

Assignment X3

Solution 3.1

The following point has been added to part (c):

A stochastic approach may be used to determine an appropriate margin to apply. [½]

The following point in part (d) has been expanded to read:

Alternatively, an explicit loading could be included <u>(*eg* a solvency capital requirement)</u>. [½]

Solution 3.2(i)

The following point has been added under 'All types':

Allowance should also be made for additional expenses that are incurred in actually terminating a policy on lapse. [½]

Solution 3.3

The following points have been added to the final section of the solution:

An inflation assumption will be needed if the annuity is linked to an inflation index. [½]

Regulation might restrict (or prescribe) the assumptions that are used, or how they must be set. [½]

Question 3.4(ii)

The question has been amended slightly to read:

(ii) Outline how the capital asset pricing model can <u>be used by</u> this company to derive appropriate risk discount rates for it to use. [4]

Solution 3.4(ii)

The following point has been added after the definition of the terms in the formula:

So the insurance company could set its risk discount rate equal to the expected return on its shares according to CAPM, *ie* the risk discount rate would be E_i. [½]

The following point has been added to the end of the solution:

The company could use different risk discount rates for different products / projects to allow for the riskiness of each. [½]

Question 3.6

Part of the question has been reworded slightly as follows:

Recent research has shown that the incidence of cigarette smoking in XYZ is 10% of the level in <u>other countries</u>.

Parts (i) and (iv) are testing higher-order skills, so the command verbs used have been changed and the question now reads:

(i) <u>Set out</u> the data sources normally available for pricing this line of business (*eg* in a developed market), indicating those which would and would not be available in the circumstances mentioned above. [5]

(iv) <u>Discuss</u> the advantages and disadvantages of such a policy provision. [4]

Solution 3.6(i)

The following points have have been added:

- medical journals, … [½]

  … either published in this country or similar overseas countries [½]

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Solution 3.6(ii)

The following bullet point has been added:

- changes in the exchange rate (if the data is based on cashflows in other currencies) [½]

Solution 3.6(iii)

The sub-headings in this section have been amended to read:

Population data, medical providers' data and medical journals based on XYZ

Reinsurers' data and data from actuarial or other consultants from overseas

Other overseas data

Question 3.7

These parts are testing application skills, so the command verbs used have been changed and the question now reads:

(i) Explain the principles that should be used for setting the bases for each of the following:

(ii) Describe how the basis might relate to that used to price the product. [2]

Assignment X4

Solution 4.1(i)

The solution has been reworded in a number of places. Replacement pages are attached.

Question 4.2

Part (i) of this question was straightforward bookwork and has been replaced by a similar but more applied version. Replacement pages are attached.

In part (ii), the command verb used has been changed and the question now reads:

(ii) Suggest reasons why the past claims experience on an employer's group disability contract may not be a good proxy for the future claims experience for the company. [3]

Question 4.4(iii)

The introductory sentence to part (iii) and part (iii) itself have been amended to read:

For many group schemes, the insurer's book risk premium rates would not be used in isolation.

(iii) Describe how the risk premium for a group scheme might be calculated in practice. You do not need to describe any additional loadings for prudence, expenses or profit. [3]

Solution 4.4

In part (i), the penultimate bullet point has been amended to read:

- level of cover / excess required.

and the final bullet point has been deleted (as free cover limits are not relevant for PMI business).

The heading to part (iii) has been changed to read:

(iii) ***Experience rating***

Solution 4.5(ii)

The following point has been added to the solution:

Insurers could implement general risk management techniques in order to manage their risks, *eg* buying (more) reinsurance or increasing margins. [½]

Question 4.6(ii)(iii)

In part (ii), the secondary command verb used has been replaced and the question now reads:

(ii) Describe the approaches that this insurer can take to calculate claims reserves, including the circumstances in which it would use each. [6]

Part (iii) is testing higher-order skills, so the command verb used has been changed and the question now reads:

(iii) Suggest how the lower-than-expected future new business volumes might impact the current and future embedded value of the insurer. [3]

Solution 4.6(ii)

The example in the third point has been amended to read:

... adjusted for any known or anticipated future changes, *eg* longevity improvements. [½]

The following point has been added under the first bullet list under 'Case estimates':

Inflation may also be taken into account if the benefits are inflation-linked. [½]

Question 4.7(v)

This part is testing higher-order skills, so the command verb used has been changed and the question now reads:

(v) Suggest other factors that should be considered before introducing this option. [2]

Question 4.8

Part (i) was straightforward bookwork and has been replaced by a similar but more applied version. Replacement pages are attached.

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Part (iv) is testing higher-order skills, so the command verb used has been changed and the question now reads:

(iv) Identify any other information other than claims experience that you would require in order to determine whether this group scheme can be profitable in 2019. [4]

Assignment X5

Solution 5.1

The following point has been added to the end of the solution:

In general, the insurer will ensure that the third-party supplier has responsible environmental, social and governance (ESG) practices incorporated into its strategy / objectives. [½]

Solution 5.2

The solution to part (i) has been amended slightly. Replacement pages are attached.

Solution 5.3(ii)

The following points have been added to the end of the solution:

- there is no appropriate reinsurance available (at least not at an acceptable cost) [½]
- the insurer is already transferring its risk, *eg* using alternative risk transfer (ART) [½]
- providers of reinsurance do not meet the insurer's required standards on environmental, social and governance. [½]

Question and Solution 5.4(i)

This part has been split into two [3] mark parts:

(i) Describe the losses that can arise to the insurer if a policy lapses. [3]

(ii) Suggest ways in which the insurer might limit the risk of policies lapsing. [3]

The solutions to these parts are largely unchanged, with the solution split around the two sections.

In the new part (ii), the first bullet point has been amended slightly, and a point on ESG has been added:

- carry out modelling to estimate the susceptibility of the product design and the company's capital to each form of lapse [½]
- ensure that responsible environmental, social and governance policies are integrated into its business model [½]

Solution 5.5(i)

This solution has been amended slightly to make it more specific to IP insurance. Replacement pages are attached.

Solution 5.5(ii)

The mark allocations to the first two bullet lists have been amended slightly to reflect that quarter marks will not be awarded.

In the first bullet list, marks should be awarded as follows:

[½ for each two examples, maximum 1½]

In the second bullet list, marks should be awarded as follows:

[½ for each two examples]

Question 5.6(i)(iii)

The wording of part (i) has been amended slightly to read:

(i) Outline the features of the benefits that <u>are likely to</u> be offered under the contract. [2]

Part (iii) is testing higher-order skills, so the command verbs used have been changed and the question now reads:

(iii) <u>Identify</u> the risks created by the method of charging for expenses, <u>suggesting</u> how these risks could be controlled. [4]

Solution 5.6(ii)

The following points have been added under 'Control of mortality and morbidity risks':

Good claims control practices may also be used to reduce the risk of fraudulent claims being accepted. [½]

The product design can be changed in order to make profits less sensitive to adverse mortality / morbidity experience, … [½]

… *eg* limiting the overall payout or payment period, removing any extra benefits (such as a death benefit). [½]

Solution 5.7(iii)

The following point has been added (with previous point included to give context):

All the above suggest that a change to risk premium reinsurance might be appropriate. [½]

Alternatively, original terms could still be used if the reinsurer deposited back its unit reserves with the insurer as this would remove the need for the reinsurer to run a parallel fund. [½]

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Question 5.8

This question has been reworded slightly and now reads:

Describe typical means of reducing the premium for income protection insurance and the risks associated with each. [21]

Solution 5.8

The quarter mark points near the end of the solution have been changed to be half mark points, in particular:

The risks here are that:

- additional cost outweighs any savings [½]

The risk here is that cost of such measures may outweigh the benefits. [½]

Question 5.9

The question has been split into three parts. Replacement pages are attached.

Solution 5.9

In the new part (i) of the question, an additional sub-bullet point has been added to the first list:

– may misrepresent the insurer's environmental, social and governance policies [½]

The new part (ii) of the question is answered using the final bullet list in the 2021 version of the solution.

Assignment X6

Question 6.1

The command verb used has been changed and the question now reads:

Assess the suitability of equities as an asset for this insurer. [6]

Solution 6.1

The following point has been added under the penultimate point (under overseas equities):

The insurer should ensure that any investment is in line with its approach towards the long-term sustainability of society and the natural environment. [½]

Question 6.2

The question has been amended to refer to individual PMI only:

Describe how the renewal experience of a health and care insurer that issues substantial volumes of individual private medical insurance business would be analysed, monitored and used to set assumptions to be used for repricing, explaining the importance of the results obtained. [10]

Question 6.3

Part (i) of this question was straightforward bookwork and has been removed. The remaining two parts have been renumbered accordingly and the question is now out of a total of [9].

Question 6.4

The introductory sentence in the question has been extended to read:

A proprietary health and care insurance company writes individual long-term care business in a number of territories.

Question and Solution 6.4(ii)

The question and solution have been rewritten (and expanded to [6]) to make it an application question, rather than straightforward bookwork. Replacement pages are attached.

Question 6.5(i)

This question now requires eight reasons and is worth [4], *ie*:

(i) List eight reasons why the company would wish to monitor claims experience. [4]

Solution 6.5(i)

The fifth bullet point has been split into two separate bullet points as follows:

- to make more informed decisions about pricing
- to make more informed decisions about the adequacy of reserves and solvency capital

Question 6.6(i)

This part is testing higher-order skills, so the command verbs used have been changed and the question now reads:

(i) Discuss possible effects of this new ruling on health insurers. [7]

Solution 6.6(ii)

The following point has been added under the second point (on improving diversification):

The rules may also specify that these investments are socially responsible, *ie* sustainable investment options that have regard to the environment and society. [½]

Question 6.8(i)(ii)

These parts of this question were straightforward bookwork and have been removed. The remaining two parts have been renumbered accordingly and the final part has been increased to be worth [11], and so the question is now out of a total of [17].

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1 Insurer as a stakeholder – product design and pricing

The insurer is primarily interested in ensuring that it remains profitable, but it also needs to maintain control of the risk-management process. Various aspects of product design will impact on these stakeholder interests.

This section looks at the general issues in which the insurer has an interest when designing health and care insurance products. Sections 2 – 5 will then look at product-specific issues for the insurer.

Product design and pricing will often be an iterative procedure as each is adjusted in turn so that all the various targets can be met, including:

- **customer acceptability**
- **regulator requirements**
- **needs of distributors**
- **price competitiveness**
- **adequate profitability / return on capital**
- **company culture in product style and price**
- **systems and other internal constraints**
- **underwriting methodology.**

These targets will be covered in turn in this section, as well as the following aspects of product design and pricing:

- risk pricing (including reinsurance)
- financing requirements
- cross-subsidies and equity
- cost of offering guarantees
- premium / benefit change at renewal / review.

The conflict between these product design factors will also be considered.

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1.1 Customer acceptability

The insurer will design the health insurance product to meet customer needs and/or provide some element of customer gain (the perceived value of the benefit exceeds the cost of premiums). To be attractive, the product must be clear about both:

(a) the benefits provided in terms of the claims triggers and cash values

(b) the amounts and variability of premiums.

There must be sufficient benefits to justify the price charged.

Marketability

The benefits offered need to be attractive to the market in which the contract will be sold. Innovative design features may make a contract more attractive as may the addition of options and guarantees. The charging structure for risks and benefits needs to be attractive to the potential market and it needs to be considered what guarantees should be given with regard to premium rates.

In the context of marketability, the actuary should ensure that the product is understandable. Special features will only be a good thing if the customer being targeted understands and appreciates them. This aspect is very sensitive to the distribution channel the insurer intends to use for the product. For example, an insurer would not attempt to sell too complicated a product over the internet.

Environmental, social and governance (ESG) considerations

As consumers become more aware of their personal responsibility towards climate change and sustainability, they will search for products designed with such factors in mind. It is increasingly common for policyholders to incorporate ESG considerations into their investment practices and product choices.

There is increasing integration of ESG in investment practices within life insurance companies, due to reasons of risk and return and the public interest as well as the more traditional ethical reasons.

Investment is more likely to be a significant consideration for a life insurer selling savings products. It is less relevant for health and care insurers, which primarily sell protection products, for which investment is generally of less importance. However, for health and care insurance products that build up significant reserves (*eg* unit-linked contracts), investment may still be worth considering.

One important factor for companies to consider in relation to product design and pricing in particular, is sustainable investment options. Sustainable investment refers to investment approaches which take account of ESG issues in a way that is consistent with the long-term sustainability of society and the natural environment. This is relevant when investment is motivated by financial objectives having regard to long-term sustainability.

Such ESG issues might include:

- environmental factors, such as how climate change could cause investments in fossil fuels and carbon-intensive industries to lose value (this is discussed in Chapter 24)
- social factors, such as the working conditions of the employees of the companies that are invested in
- governance factors, such as the accounting standards used by these companies.

The insurer would therefore need to consider the reaction of potential policyholders to such investments when assessing the marketability of its contracts.

Investors and policyholders increasingly analyse such non-financial information about a product when evaluating whether to purchase it or not. Products should be designed in line with the objectives of the UN Sustainable Development Goals and Principles for Responsible Investment.

The Principles for Responsible Investment (PRI) is an independent organisation that works to understand the investment implications of ESG factors, and to support those institutions that have signed up to adhere to its principles. It encourages investors to collaborate in order to align their investment practices as well as enhancing their returns and better managing their risks. It also provides research and education itself. Though independent, it is supported by the United Nations (UN).

At the core of the PRI's principles are the UN's sustainable development goals (SDGs). There are 17 development goals, ranging from:

- ensuring basic human needs (inclusive and safe human settlements, clean water and sanitation, zero hunger, no poverty) are met
- promoting other human needs (good health and wellbeing, access to quality education, inclusive employment opportunities, peaceful and inclusive societies)
- reducing inequalities (between countries, genders, *etc*)
- ensuring production and consumption of goods and services is conducted responsibly and sustainably (including resilient infrastructure, the provision of affordable but clean energy, sustainable industrialisation, and the fostering of innovation)
- conserving and protecting nature (both wildlife and the climate).

1.2 Regulator requirements

The local regulator may have certain requirements to be met regarding the way in which healthcare insurance products may be designed.

This is discussed further in Section 6, which considers the regulators as stakeholders.

In some territories, new contracts must be approved by the regulator before they can be launched, and premiums may need to be filed with the regulators to prevent excessive charging.

This will be particularly important in markets where there are only a small number of insurers and the insurance product is bought by almost everybody (and so is in effect compulsory).

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1.3 Needs of distributors

The sales channels for selling health and care insurance are described in Chapter 8. The mains channels are:

- independent intermediaries (IFAs)
- tied agents (agents with links to particular insurers)
- an insurer's own salesforce
- direct marketing by the insurer to the consumer.

Marketability, distribution and competition

The people responsible for selling and marketing the insurance products that the actuary is designing are important stakeholders in the process.

It may be desirable for the product to be capable of being distributed through the insurer's normal sales methods – unless there is an intention to move into new distribution channels. Consultation with sales representatives will normally be a vital part of contract design.

A company will aim to have a competitive product in order to achieve forecast sales volumes and so will not want the structure, level of the charges and resultant premium to depart too far from those of competitors (although this may depend on how it will market the contract).

The product must be designed to meet customer needs. Many insurers do not sell directly to the public, but market their products through intermediaries (the insurer is the producer and the intermediary acts as the retailer). In this case, insurers are not in direct contact with customers, so they may learn little about customers' needs, however, intermediaries can help provide this information. Some insurers will also use market research to help in the design of their products (*eg* sample surveys or focus groups of customers or potential customers).

The actuary should involve sales and marketing teams early in the design project. Not only will this give actuaries a better feel for what might sell in the marketplace, but they will also get an insight into customer needs in appropriate segments of the population and a view of what competition is doing in these fields. Equally, the iterative process of benefit and premium adjustment may give the salesperson a better understanding of the value and cost of various aspects of the overall product.

The actuary may also be involved in sales training, explaining the main features of the new product, the needs that they address and the important messages to impart in the sales process. This will ensure a greater clarity of the product's purposes. The product's commission and clawback structures will also be explained, as will the scope for premium review. The extent to which the product must fit with local regulatory sales and disclosure rules must also be clearly described. The product also needs to have a sales incentive that is sufficient to encourage distribution, but also appropriate from a regulatory perspective.

The different types of commission and clawback structures will be discussed in Chapter 8.

1.4 Adequate profitability / return on capital

The profitability of a product will be a function of the amount sold and the profit margin per policy. Sufficient margins must be retained to ensure an adequate return on capital.

However, the product must still be priced at a level that will attract customers (in preference to competitors).

The balance between these competing forces is a fundamental task for management.

A company will want to ensure that the premiums charged for contracts will be sufficient to cover the benefits provided and the expenses in most foreseeable circumstances, with, for proprietary companies, a surplus to reward shareholders whose capital has been used to support the company.

1.5 Company culture in product style and price

Consistency with other products

The company may wish to ensure that the charging and benefit structures of a new policy are at least similar to any existing business.

The key reason is that a major change will result in significant systems development, which will take time. However, there are also benefits in terms of saving time and cost with such things as training administration and sales staff, printing marketing literature and so on.

Furthermore, there is the possibility that a design that appears much more attractive or favourable to new policyholders may seem unfair to existing policyholders and may lead to some dissatisfaction and possible marketing risk. For example, it may cause many policyholders to surrender their policies over a short period of time and the company may be unable to recover all of its expenses from them (particularly its fixed expenses).

1.6 Systems and other internal constraints

Systems implications

Systems can be a positive source of information for the actuary, but often in the product development process they act as a constraining influence. The actuary must be aware, when proposing a new contract, of what existing systems can accommodate and what can be changed, at what cost and in what timescale.

The key considerations are:

- **computer systems must record all processes of insurance**
- **systems must provide information to enable profitability to be assessed**
- **new products may require systems' reorganisation**
- **any launch or redevelopment will require a reappraisal of priorities**
- **the expenses relating to the systems changes must be included in the product costing**
- **time must be allowed for development and testing.**

Continuing dialogue with a key systems decision maker will be important in the process.

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Administration systems

The system requirements of a new product may limit either the benefits to be provided or the charging structure to be adopted.

For example, if the company's computer policy administration system cannot cope with administering a waiver of premium option, the product should not have one (unless it is so important that it is worth spending money on enhancing the system).

The issue of compatibility with the administration system can also be extended to cover the aspect of simplicity: it is in the interests of the administration system, policyholders, agents / brokers and the company's staff that the product be simple. Thus, any complications must be warranted by some significant advantage in terms of the marketing of the product.

Data capture

The capture of data is crucial to the management of the business, initially in the administration, but latterly in the monitoring of own company experience, and subsequently in the use of these data to re-price the products on a more relevant basis.

The information technology must:

- **capture individual policy details at inception**
- **align these to claims information**
- **combine the policy and claims data to monitor profitability**
- **group by risk characteristics**
- **be able to add external data as appropriate**
- **be able to model and project, including other aspects of company cashflow.**

1.7 Underwriting methodology

Medical underwriting

The rationale for medical underwriting and policy acceptance is such a fundamental element of product design and pricing that it may dominate many of the conditions within the contract and be a key determinant of the premium to be charged. For example, the decision to employ the technique of excluding pre-existing conditions will have an impact on product development, pricing and internal systems of control. The applicant is accepted on standard premium terms, but the policy is endorsed so that any pre-existing conditions are specifically excluded.

The process of medical underwriting will be described in Chapter 27. It is the process by which the insurer collects data about the proposer's current health and their medical history in order to assess the risk it is being asked to insure, and using this information it decides whether or not to accept the risk and on what terms.

2.4 The effect of the regulatory regime on contract design

The regulatory environment is likely to have a significant effect on the design of the contracts sold by insurance companies, as the companies will want to make the best use of any regulatory opportunities available to them. Conversely, contract design will have to take account of any constraints imposed.

2.5 Climate change and regulation

Many countries also put in place policies and regulations to support attainment of particular goals. For example, there is widespread concern among policymakers and financial regulators of the damage that climate change could cause to the financial system and, conversely, the role that the financial system can play in achieving an orderly transition to a low-carbon economy.

Chapter 24 looks at how climate change can pose a risk to financial companies.

In addition, financial companies can assist in the transition to a low-carbon economy by investing in companies that develop new, greener technologies for example.

In order to limit the impact of climate change on the financial systems, regulators are working on regulations whose aims include ensuring that financial institutions:

- **consider climate risks in business decision making and strategic planning**
- **effectively disclose and report on climate-related risks and opportunities**
- **adopt a consistent and reliable means of assessing, pricing and managing climate-related risks**
- **incorporate environmental, social and governance (ESG) factors into investment management decisions**
- **incorporate financial risks from climate change into existing risk management processes.**

At the moment, many insurers have made a voluntary commitment to address the impact of climate change, although future regulation may require all insurers to take action. For example, a number of insurers have signed up to the United Nations-convened net-zero asset owner alliance which commits to moving asset portfolios to net-zero greenhouse gas emissions by 2050.

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3 The taxation regime

3.1 Approaches to taxation

Insurance business may be taxed in different ways. The most common methods are:

- **a tax on the annual profits of the business, where profits broadly means the excess of the change in the value of the assets over the change in the value of the liabilities**
- **tax payable on investment income / gains less some or all of the operating expenses of the company.**

In addition, there may be a tax on premium income.

One way of looking at these two approaches is that they recognise different aspects of the nature of an insurer. The 'profits' approach recognises that an insurer, at least if it has shareholders, is a company trying to make a profit like any other.

The 'investment income' approach could be thought of as treating the insurer as a group of individuals pooling their resources for investment. If the investment return of individuals is taxed then it is logical that this return should be taxed if it is earned within an insurance company (provided the policy proceeds are tax-free when they are paid to the policyholder).

These two approaches are now considered in more detail.

The profits approach

The profits calculation described above essentially measures taxable profit as the increase in the free assets of the insurer over the year, where free assets is defined as the value of assets minus the value of liabilities. Any solvency capital requirement may or may not be added to the value of liabilities in this calculation.

Define:

A_0 = assets at start of year

A_1 = assets at end of year

V_0 = liabilities at start of year

V_1 = liabilities at end of year

Then profit could be stated as:

1. $(A_1 - A_0) - (V_1 - V_0)$ *ie* the definition of profit given in the Core Reading above
2. $(A_1 - V_1) - (A_0 - V_0)$ *ie* increase in free assets over the year

5.8 Climate change

Climate change could have significant implications for health and care insurers, and could impact many different areas of actuarial work including:

- **product design**
- **pricing**
- **reserving**
- **capital management**
- **risk management**
- **investment.**

Boards of financial institutions will therefore need to consider the potential impact of climate risks more in future business decision making and strategic planning.

Climate change risks could arise from adverse changes in the physical environment and secondary impacts in the economy at a regional or a global scale.

Climate risks for financial companies are categorised into physical, transition and liability risks:

- **Physical climate risks are the first-order effects of environmental changes such as greenhouse emissions, pollution and land use. An example of physical climate risks could be an increase in mortality or morbidity in an insured population due to global warming or pollution.**

  So physical risks could impact an insurer by increasing the number of claims, but could also impact it in other ways, *eg* an increase in storms or floods could damage infrastructure that the insurer holds as an investment.

- **Climate transition risks refer to economic, political and market changes as a result of efforts to mitigate climate change. An example of climate transition risks could be policy changes designed to reduce fossil fuel consumption (*eg* taxes, subsidies, limitations) resulting in investments in fossil fuels and carbon-intensive industries losing value.**

  So profitability might be expected to fall for some sectors of the economy, particularly if they have a large carbon footprint. Indeed, some investments may lose all their value, *eg* coal mining if there was a ban on the use of coal-fired power stations. In contrast, some sectors of the economy may see increased profitability, *eg* companies specialising in new greener technologies.

- **Climate liability risks can arise from injured parties seeking compensation for the impacts of climate change. An example of climate liability risks could be a link established between air pollution and adverse health conditions, resulting in a new class of latent claims.**

  Health and care insurance companies may face legal risks such as mis-selling if they fail to take into consideration their policyholders' preferences with regards to sustainable investment.

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X1.1 A critical illness policy pays a lump sum on the diagnosis of a specified list of illnesses that are deemed to be both permanent and irreversible. It also pays the lump sum should the policyholder become totally and permanently disabled, and on terminal illness. The assessment period for the product is 12 months.

Describe the following features of this CI product, outlining how they can help to ensure that the product is acceptable to both the policyholder and the insurer:

- assessment period
- permanent and irreversible illnesses
- total permanent disablement
- terminal illness.

[5]

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Assignment X1 Solutions

Note to markers: where marks are available for examples, please award credit for any appropriate example.

Solution X1.1

This question requires the application of knowledge of various terms that can be found in Chapter 31, Glossary. Additional detail on ***total permanent disablement*** *and* ***terminal illness*** *can be found in Chapter 2, Critical illness insurance.*

Assessment period

The *assessment period* is the period during which the insurer will assess a condition before deciding upon their acceptance of the CI claim. [½]

An assessment period of 12 months should give the insurer sufficient time to collect all the necessary evidence to assess the claim. [½]

The assessment period provides clarity to policyholders regarding how long they will need to wait for a decision on whether their claims will be paid. [½]

Permanent and irreversible

The term *permanent* is used to describe a health condition that is expected to last throughout the insured person's life, irrespective of when the cover ends or the insured person retires. [½]

Irreversible conditions are those that cannot be cured by medical treatment and/or surgical procedures at the time of the claim. [½]

By requiring that the illnesses covered are both permanent and irreversible, the insurer should be reducing the risk that claims that do not meet the purpose of the cover, *ie* covering more serious conditions, rather than leading to windfall claims. [½]

From the policyholders' point of view, these requirements on illnesses are likely to tie in with their needs, with temporary, acute conditions covered by alternative types of health and care insurance product. [½]

Total permanent disablement

In this context, the word *permanent* is often difficult to define and the insurer's interpretation does not always match the policyholder's understanding and expectation. One definition proposed is 'beyond the hope of recovery in your lifetime'. [½]

The word *total* in this definition usually means the failure of ability to perform a major or substantial part of a job or function. [½]

Total permanent disablement might be specified in terms of inability to perform own occupation, suited occupation or any occupation, or it might be specified in terms of inability to perform work tasks or other activities. [½]

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By requiring that disability is both total and permanent, the insurer should be reducing the risk that claims do not meet the purpose of the cover, *eg* by not covering temporary sickness that would be covered under an IP policy. [½]

The exact definition used will determine how suitable / effective the cover is for the policyholder. [½]

Terminal illness

This is a medical condition that is expected to result in the person's death within a short period, *eg* 12 months. [½]

From the point of view of policyholders, terminal illness cover ensures that all conditions that significantly reduce life expectancy are covered, albeit at a late stage, which can help meet their needs. [½]

For the insurer, adding this cover may be perceived well by the market and may reduce the number of disputed claims. [½]

[Maximum 5]

X4.2 (i) Explain the main components of the risk premium formula that would be used for pricing group health and care insurance using experience rating. [3]

(ii) Suggest reasons why the past claims experience on an employer's group disability contract may not be a good proxy for the future claims experience for the company. [3]

(iii) Explain why a simple comparison of premiums and claims paid in a calendar year may fail to give a proper view of the profitability of a group disability contract. [4]

[Total 10]

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X4.8 The pricing actuary of a health insurance company has been asked to give advice in respect of a UK-type large group health cash scheme insured with the company.

(i) Compare the key features of a typical UK-type health cash contract with a comprehensive PMI product. [4]

The following historical data on the health cash contract for the 2014 to 2018 scheme years has been extracted from the company database:

Scheme Year	*Written Premium*	*Incurred Losses*
	£000	£000
2014	150	130
2015	160	145
2016	100	105
2017	120	110
2018	140	130

Rates increased for the 2016 scheme year by 10%. There have been no other rate changes.

Claims inflation has been running at 1% per annum over this period for this group scheme.

(ii) Calculate the loss ratio that can be expected for 2019 for this group assuming that there is no rate increase at the 2019 renewal, based on all of the historical experience and the rate change and inflation assumptions given above, stating any assumptions you make. [8]

(iii) Calculate the rate increase required at the 2019 renewal to bring the target loss ratio for this group for the 2019 scheme year up to 85%. [1]

(iv) Identify any other information other than claims experience that you would require in order to determine whether this group scheme can be profitable in 2019. [4]

The managing director has realised that the rate of claim inflation on this group since 2014 is substantially less than retail price inflation.

(v) Suggest possible reasons why the claim inflation rate is so low. [2]
[Total 19]

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Assignment X4 Solutions

Note to markers: where marks are available for examples, please award credit for any appropriate example.

Solution X4.1

The method of pricing income protection insurance is covered in Chapter 17, Pricing (1) – Individual business. Chapter 11, Modelling, contains more general information on multiple-state modelling, which is also useful for part (ii).

This question is taken from Subject ST1, September 2017, Question 2(i)(ii).

(i) ***Inception / disabled life annuity approach***

The inception / disabled life annuity approach involves the projection of claim cashflows, which are then discounted back at an appropriate rate of return. [½]

In order to project the cashflows, the insurer will need to determine two sets of quantities, namely claim inception rates and disabled life annuities. [½]

Claim inception rates

The insurer will use its data to determine the 'sickness inception rates' that apply to its portfolio. [½]

A policyholder will have to become sick and remain sick until the end of the given deferred period for the benefit payment to commence, ... [½]

… so by multiplying the sickness inception rates by the probability of remaining sick throughout the deferred period, the insurer will obtain the 'claim inception rates', … [½]

… *ie* the probability that a claim will become payable to an individual in a particular year of age, for a given deferred period. [½]

Disabled life annuities

A 'disabled life annuity' is the present value at the date of claim inception of expected claim payments to individuals disabled after the deferred period until policy expiry. [½]

The inception / disabled life annuity approach allows for:

- any escalation of the claim amount
- interest
- the probabilities of death and recovery between the end of the deferred period and expiry date.

[½ for any two]

It does not allow for future periods of sickness after recovery. [½]

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The claims outgo in any period is calculated as the product of:

- the annual benefit amount
- the claim inception rate (which represents the probability of becoming eligible for claim)
- the disabled life annuity
- a discount factor that applies from the date of claim back to the policy inception date.

[1]
[Maximum 3]

Solution X4.2

This question is an amended version of Subject ST1, September 2007, Question 4.

Group health and care products are covered in Chapter 18, Pricing (2) – Group business.

In addition:

- *the sections on relevance in Chapter 12, Data may be useful for part (ii)*
- *Chapter 21, Reserves and embedded value, may be useful when considering the 'claims paid' aspect of part (iii), and the assumptions chapters (Chapters 13-16) and Chapter 19, Pricing (3) – Other considerations consider the elements of the premium (other than the risk cost).*

(i) ***Formula for pricing group health and care insurance using experience rating***

Experience rating is the practice whereby the health and care premium for a group contract depends wholly or partially on the past experience of that group. [½]

The risk premium would be calculated as a weighted average of: [½]

- the *burning cost* of the scheme, … [½]

  … which is typically the estimated cost of claims in the forthcoming insurance period, calculated from the group's previous years' experience, … [½]

  … adjusted for changes (*eg* in the numbers insured, the nature of cover and medical inflation) [½]

- the *insurer's standard risk premium* (or book rate) for this type of scheme. [½]

The weight (*ie* a factor between 0 and 1 inclusive) applied to the burning cost (*ie* the group's past experience) is known as the *credibility factor*. [½]

[Maximum 3]

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Solution X4.8

This question is an amended version of Subject ST1, September 2007, Question 7.

The term 'loss ratio' is defined in the Glossary (Chapter 31). One main approach is given below, but credit should be given for alternative, valid approaches, provided they are accompanied by suitable assumptions.

Part (iv) requires some deeper thinking. There are a number of chapters that might be useful here:

- *Chapter 9 contains relevant ideas about the influence of the external environment on claims experience*
- *Chapters 13-16 are about assumptions – factors that affect claims assumptions may be particularly relevant*
- *Chapters 17-19 are about pricing, in particular, Chapter 18 is about pricing group business and Chapter 19 contains additional considerations when pricing.*

(i) ***Key features of health cash vs comprehensive PMI***

Under both health cash and PMI, the insured event is policyholders needing certain healthcare-related treatments, usually for short-term acute conditions. [½]

Comprehensive PMI indemnifies the policyholder against medical costs, …

… whereas health cash plans are a defined-benefit defined-premium insurance product, *ie* they provide a defined cash benefit in the event of a claim. [½]

In addition, health cash plan benefits may be subject to limits to ensure that the claim payments to the customer are not more than a certain proportion (*eg* 50%) of the medical bill. [½]

As the cash benefit is generally small relative to the full cost of indemnity, there is less financial incentive for potential policyholders to take out a health cash policy if they know they are to claim shortly, … [½]

… therefore it reduces the risk of anti-selection for the insurer as compared to a PMI product. [½]

Health cash plans typically charge a low level of premium, whereas comprehensive PMI will be considerably more expensive. [½]

Under health cash plans, the policyholder and family are entitled to a range of specific payouts dependent on certain healthcare-related events. [½]

These include:

- dental
- optical
- physiotherapy
- maternity
- hospitalisation

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- recuperation
- hearing aids
- consultation.

[½ for each two items]

Comprehensive PMI may also cover these things, but is also likely to cover a far greater range of treatments, including: [½]

- full cover for hospital in-patient costs, …

  … which might include accommodation for the policyholder (or a parent) to stay in hospital overnight
- full cover for specialist fees for both in- and out-patients
- other features, such as a private ambulance.

[½ each for relevant treatments, maximum 1]

Health cash plans are typically bought in 'units' with different schedules of benefits and equivalent levels of contribution increase, whereas all PMI contracts within a cohort are typically eligible for the same benefits. [½]

Under both types of product, a waiting period (maybe six months) often applies before benefit eligibility. [½]

Pre-existing conditions may also impact on the policyholder's ability to claim under both types of contract. [½]

[Maximum 4]

X5.9 A health and care insurer writes income protection, critical illness and private medical insurance products.

The organisation has just gained approval from the regulator to distribute its products through 'Health and Care parties' where existing policyholders can hold annual gatherings of friends and family to sell the insurer's products. The party hosts will guide their guests as to the appropriate forms of cover and will be remunerated on a commission basis.

(i) (a) Describe the insurance and other business risks to the insurer associated with this proposal.

(b) Suggest how each of these risks might be mitigated.

[20]

(ii) Suggest the main items of experience that should be monitored in order for the insurer to enable these risks to be managed. [4]

[Total 24]

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Solution X5.2

This question is a slightly modified version of Subject ST1, September 2006, Question 6(i) and (iii).

It is largely a knowledge-based question on underwriting from Chapter 27, Other risk management techniques.

For part (ii), Chapter 5, Group products, also contains some useful material on underwriting. Note that the use of free cover limits automatically introduces a level of financial underwriting.

(i) ***Medical and financial underwriting on individual IP***

It is likely that full medical underwriting will be carried out on John. [½]

The insurance company will require evidence about John's health, in order to assess what his state of health is relative to the standard. [½]

The primary source of evidence will be information provided by John on the proposal form or on a supplementary questionnaire, … [½]

… *eg* height, weight, answers to questions about medical conditions, family medical history, *etc*. [½]

If this information suggests the need for further investigation, the insurance company might choose to obtain additional medical information. [½]

This would probably incur expenses, so the insurance company will assess the cost of this against the possible loss that it will make if it misestimates John's state of health. [½]

Such additional information might include:

- a report from a doctor that John has previously consulted [½]
- the results of a medical examination on John that has been carried out at the request of the insurance company [½]
- the results of specialist medical tests on John. [½]

Financial details, such as evidence of John's earnings and assets, should also be obtained and verified. [½]

[Maximum 3]

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Solution X5.5

Underwriting is covered in Chapter 27, Other risk management techniques.

(i) ***Reasons to underwrite***

- To protect against anti-selection. [½]

  Anti-selection might lead to higher-than-expected frequency of claims and longer-than-expected average claim durations (hence leading to a higher-than-expected average cost of claims). [½]

  In particular, the company will want to identify lives in such poor health that it should decline to cover them. [½]

- To classify other lives appropriately in order to reduce heterogeneity. [½]

  This helps to ensure a fair premium for all applicants ... [½]

  … which is particularly important to do at outset because premiums are guaranteed, … [½]

  ... and also makes data easier to analyse and reduces the variance of claims. [½]

- To identify the special terms that are appropriate for substandard risks. [½]
- To help ensure that actual IP claims experience – including both claim inception and claim recovery rates – does not depart too far from that assumed in pricing. [½]
- To combat over-insurance using financial underwriting, *ie* to ensure that the benefit received (including State benefits) is sufficiently lower than salary in order to encourage a return to work. [½]
- To enable the insurance company to obtain reinsurance on acceptable terms. [½]

[Maximum 4]

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X6.4 A proprietary health and care insurance company writes individual long-term care business in a number of territories.

(i) Describe the investigations that would be undertaken to determine an appropriate investment strategy. [8]

(ii) Outline how the insurance company's investment might be restricted as a result of the regulatory regime. [6]

[Total 14]

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(ii) ***Restrictions on investment***

There may be restrictions on the types of assets in which the insurer can invest, … [½]

… for example, it may not be allowed to invest in unlisted equities or derivatives as these may be deemed to be too risky, … [½]

… and it may be required to demonstrate that it has a responsible investment policy with regard to issues such as climate change and long-term sustainability. [½]

There may be restrictions on the amount of any particular type of asset that can be considered for demonstrating solvency. [½]

There may be restrictions on the maximum exposure to a single:

- asset class, … [½]

  … *eg* investing in providers of care or care homes might provide a good match by nature for indemnity benefits, but may also create an unacceptable concentration of risk [½]

- counterparty / country. [½]

There may be a requirement to hold a certain proportion of total assets in a particular class – for example government bonds. [½]

There may be a limit on the extent to which mismatching is allowed at all, … [½]

… for example, for this insurer:

- there may be a requirement to hold bonds to match any annuity benefits, as these are likely to provide the best match in terms of cashflows, … [½]

  … with fixed-interest bonds being required for level annuity benefits and index-linked bonds being required for index-linked annuities (assuming bonds with a suitable index exist) [½]

- there may be a requirement to match assets and liabilities by currency. [½]

If assets and liabilities are mismatched by any feature (*eg* nature, term or currency), there may be a requirement to hold a mismatching reserve. [½]

There may be restrictions on the valuation method used, … [½]

… for example, the prescribed valuation method of the assets might make certain assets relatively attractive, … [½]

… or the assets held might affect the liability discount rate that can be used (which again might affect the relative attractiveness of different assets). [½]

There may be rules on the custodianship of assets, *eg* restrictions on who is permitted to look after them. [½]

This is most likely to be the case for overseas assets held by the insurer. [½]

[Maximum 6]

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