INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

September 2018

Subject SA1 – Health and Care
Specialist Applications

Introduction

The Examiners' Report is written by the Principal Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and using past papers as a revision aid and also those who have previously failed the subject.

The Examiners are charged by Council with examining the published syllabus. The Examiners have access to the Core Reading, which is designed to interpret the syllabus, and will generally base questions around it but are not required to examine the content of Core Reading specifically or exclusively.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report; other valid approaches are given appropriate credit. For essay-style questions, particularly the open-ended questions in the later subjects, the report may contain more points than the Examiners will expect from a solution that scores full marks.

The report is written based on the legislative and regulatory context pertaining to the date that the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

Mike Hammer
Chair of the Board of Examiners
December 2018

A. General comments on the *aims of this subject and how it is marked*

1. The aim of the Health and Care Specialist Applications subject is to instil in the successful candidates the ability to apply knowledge of the United Kingdom health and care environment and the principles of actuarial practice to the provision of health and care benefits in the United Kingdom.

2. Candidates who approach the questions, especially the more substantial elements of each question, in a methodical and detailed manner are far more likely to satisfy the examiners and receive a pass in the subject. Candidates will gain few marks if they do not address the question asked but merely write around the topic of the question. The mark allocation for each question part gives an indication of the relative length of answer or number of points to be made to gain full marks.

3. It is often helpful to use subheadings when answering long part questions.

4. Candidates who give well-reasoned points, not in the marking schedule, are awarded marks for doing so.

B. General comments on *student performance in this diet of the examination*

This paper was more challenging than some SA1 papers in recent diets; this is reflected in the lower pass mark.

Well-prepared candidates scored well across most of the paper. Questions that required an element of analysis or application of knowledge to a particular situation were less well answered than those that were mainly knowledge based.

It was encouraging to see many candidates using headings in their answers to the longer part questions.

The comments that follow the questions concentrate on areas where candidates could have improved their performance.

C. Pass Mark

The Pass Mark for this exam was 58.

Solutions

Q1

(i) CI provides financial protection for an individual and their family in the event the insured suffers a serious illness…. [½]
… by paying out a sum assured on the diagnosis of a critical illness, or severe permanent condition…. [½]
…or death (in the case of this product) [½]
Statistics show a significant proportion of population are likely to suffer a serious illness that may be covered by CI policy. [½]
No restrictions are imposed on how the lump sum benefit is used. [½]
Usually payment is made on the first occurrence of these conditions and then the policy ceases [½]
….unless there are buyback options/ continuation options. [½]
The lump sum can be converted to income for dependents (e.g. wife & children) or used to fund a variety of expenses such as household expenses [½]
Making adjustments to the home (or moving home) to cope with disability [½]
Covering high costs of adapting to changes in life style [½]
Funding additional assistance at home (e.g. a home nurse) [½]
The sufferer's spouse may have to give up work to care for the insured [½]
A CI policy is sometimes taken as part of a mortgage; the lump sum can also be used to pay-off a mortgage [½]
In some cases there may be a windfall payment as illness may not have long term effect person – e.g. angioplasty [½]
Payment helps cover medical costs not met by the State [½]
The policy provides cover for a term to age 65 after which individuals are likely to be retired with lower monthly financial commitments [½]
By offering accelerated cover there is no risk of the policy not paying out if death occurs soon after CI diagnosis, unlike a stand-alone policy [½]
The benefit also provides an investment and savings facility, particularly due to the fact that it is linked to investment funds as fund is available from year 3 onwards (in the case of a surrender). [1]
The policyholder can select investment options that the policyholder hopes will reduce the long-term cost of insurance. [½]
The premiums are predictable, along with a fixed sum assured; this gives the policyholder peace of mind. [½]
The guaranteed insurability option also allows the individual additional security of mind, knowing that the cover can be increased in case there is a spike in treatment costs, healthcare inflation, consumer price inflation or the perceived risk. [1]
It may also meet customer needs if the individual's circumstances change, for example if they have children during the 10 years, or move house, and need a higher sum assured to meet the increased financial burden [½]
Straightforward, easy to understand charging structure [½]
(Usually) no equivalent benefit offered by the State [½]
[Max 5]

(ii) Risk of mis-pricing [½]
…..Premiums set incorrectly (too high or too low) [½]
…..Miscalculating cost of options [½]
The morbidity rates associated with the critical illnesses covered by the product could increase significantly over time, without the option of increasing the premiums or adjusting cover for the insurer. [½]
Similarly, the mortality experience could deteriorate overtime resulting in more claims than expected. [½]
Potential anti-selection risk on policy purchase [½]
For example non-disclosure or misrepresentation by policyholder [½]
Anti-selection risk on the exercise of insurability options on the 10^{th} and 20^{th} anniversary dates when there is the option to increase the coverage i.e. poor health lives more likely to increase sum assured. [½]
Selective withdrawals, i.e. the healthier lives withdrawing and leaving a risk pool with a higher average morbidity. [½]
Rates of diagnosis/claims are higher than expected. [½]
Advances in medical science – early diagnosis, national screening programmes [½]
Low investment returns reduce the income to the insurer from management charge [½]
Policy wording risk e.g. claims paid that were not originally intended. [½]
Risk of marketing literature or sales material being wrong, possibly leading to policyholder expectations that can't be met [½]
Withdrawal Risk - There may be a higher proportion of policyholders lapsing before they have covered their fixed expenses, than has been allowed for in pricing. [½]
Sales Risk - Volumes of business may not be sufficient to cover development or fixed costs [½]
Sales Risk - Volumes of business too high, leading to capital constraints [½]
The expenses associated with running the fund and the risk portion are higher than has been assumed. [½]
Expense inflation higher than assumed in pricing [½]
Charges may not cover administration costs [½]
Unit pricing errors, leading to costs of remediation and implementation of correcting errors [½]
Mix of business risks – greater proportion of lower size cases, mix of business by gender adverse or greater proportion of riskier lives than has been allowed for in pricing. [½]
Administration errors (e.g. underwriting, claim management, policy processing). [½]
System errors, e.g. wrong allocation of premiums to funds [½]
The performance of the fund could be poorer than assumed in the pricing. This could result in unit funds being exhausted and the insurer not having income to cover claims etc [½]
Changes in the tax regulation for either the risk benefit or the unit funds which could pose a threat to the profitability (and overall viability) of the product. [½]
Any new entrants with better product features or better pricing could pose a threat to the product volumes and mix. [½]
Any changes in regulation, particularly around the use of investment vehicles in risk benefits, would have a significant impact on this benefit. [½]
Poor product design: The product may not resonate with the market as it may not meet customer needs or it may be difficult to understand. [½]
Reinsurance: Failure to honour the liability payments or failure to secure adequate reinsurance in the market. [½]

Data: Insufficient data to price the benefit, inadequate or incorrect data collection. [½]
Counterparty risk: This will be mainly with the investment house and the distribution centres in this case. [½]

If policyholders can choose the funds the unit fund is invested in, this could lead to lower returns than expected, leading to lower amounts as charges [½]
If the charges and premiums are non-reviewable, there is a risk that these will become insufficient to cover the costs of providing the benefit, particularly as the term could be very long. [½]
Profitability risk – profitability may vary by fund type so profitability may be dependent on choice of funds by the policyholder. [½]
Capital requirements higher than expected – particular if the fund's investment performance is volatile [½]
[Max 8]

(iii) The policy liabilities are unlikely to be observable in the market so the BEL should be calculated on a market consistent approach [½]
The unit and non-unit components of the product must be unbundled. [½]
The BEL may be calculated separately for the unit-linked component of the contract. [½]
For the unit-linked component the BEL would be the face value of units attaching to the policy [½]
plus a non-unit reserve. [½]
The non-unit reserve is the present value of expected future cashflows. [½]

The cashflows are:
Premiums not allocated to units [½]
Charges [½]
Claims – death, withdrawal or CI [½]
Expenses. [½]
Reinsurance payments/recoveries are treated as an asset so are excluded from BEL [½]
In order to project future charges expressed as a percentage of the fund value (annual management charges), the unit fund value will need to be projected [½]

Methodology
Insurer must take into account all relevant data, both internal and external, when arriving at assumptions that best reflect the characteristics of the underlying portfolio. [½]
Assumptions should be best estimate with no prudential margins. [½]
e.g. option take up rate, non-unit fund investment returns, expenses [½]
Assumptions should allow for all expected decrements (including lapses) and policyholder actions [½]
And take account of expected future changes in health status [½]
The guaranteed insurability option needs to be valued as part of the BEL [½]
The expected cost of the option could be calculated using a stochastic approach [½]
Although a deterministic approach could be acceptable given the risks and materiality. [½]
The cashflows are discounted using the Solvency II risk-free yield curve… [½]

…. issued by EIOPA for the relevant currency. [½]
The long-term liabilities are not predictable so it is unlikely that a matching adjustment will apply in this circumstance for the unit-linked element of the contract. [½]
However, it may be possible that a volatility adjustment can be added to the yield curve. [½]
The purpose of the volatility adjustment is to reduce the risk of forced sales of assets in the event of extreme bond spread movements [½]
Risk free discount curves including the volatility adjustment are published by EIOPA. [½]
The adjustment is based on the spreads of a representative portfolio of assets for the relevant currency. [½]
Regulatory approval might be required for a volatility adjustment. [½]
and is subject to certain risk management requirements (e.g. a liquidity plan and sensitivity analysis) [½]
Future premiums can be taken into account up to the "contract boundary"… [½]
… which is broadly defined as the point at which the company can unilaterally terminate the contract… [½]
… or refuse to accept premiums or change the premiums or benefits in such a way that they fully reflect the risks. [½]
For long term insurance business this would likely mean the expiry date or term of the contract. [½]
In this case the contract boundary would likely be the end of the term [½]
Expenses need to take into account both overhead and directly attributable expenses … [½]
… and future expense inflation. [½]
No closure reserve is required. [½]
The non-unit reserve should be calculated on a policy-by-policy basis. [½]
Grouping of policies can be used provided certain conditions are met… [½]
… including validation of accuracy. [½]
The non-unit reserve can be negative. [½]
[Max 10]

(iv) The risk margin is determined using a cost of capital approach. [½]
based on the cost of holding capital for risks that cannot be hedged in financial markets [½]
The capital is a subset of the SCR [½]
For this product, this is likely to include insurance risk… [½]
… e.g. persistency, mortality, morbidity, expenses… [½]
… and it will also include operational risk.(e.g. unit pricing errors, administration errors) [½]
If reinsured then may include reinsurance credit risk.[½]
The risk margin calculation involves projecting forward the Solvency II capital requirement on the existing business …. [½]
.... for the full run-off of the business. [½]
These projected capital amounts are then multiplied by a cost of capital rate [½]
currently 6% p.a. [½]

The product of the cost of capital rate and the capital requirement at each future projection point is then discounted, using risk-free discount rates, to give the overall risk margin. [1]
As the projection of the SCR is potentially complex, various simplified approaches can be used [½]
For example, selecting a driver which has an approximately linear relationship to the required capital component. [½]
Examples could be
Unit reserves for persistency risk. [½]
Sum at risk for morbidity risk [½]
Total reserves for operational risk [½]
Policy count for expense risk [½]
The projected capital is then approximated as a fixed percentage of the projected values of that driver. [½]
The risk margin could be reduced to allow for diversification benefit [½]
[Max 6]

(v) The change could be brought about by
A reduction of the risk-free discount rates [½]
Fewer withdrawals of inforce business than expected [½]
Change in company's SCR's [½]
Increases in SCR stresses [½]
… e.g. operation issues, very bad claims experience [½]
e.g. Increase in the volatility of claims, making predicting the claims more difficult [½]
…. e.g. Increased volatility of medical inflation which impacts the products that provide some form of indemnity cover such as private medical insurance and hospital cash plans. [½]
Change in model point methodology increasing SCR's [½]
Change in drivers used to simplify projected capital requirements [½]
Move to internal model that increases SCR's [½]
SCR higher than last year due to capital add on from regulator [½]
Risk margin may have been understated in the previous year [½]
Change in diversification benefits, [½]
i.e. change in correlations [½]
Changes in business mix, with the insurer writing a greater proportion of products with greater risks [½]
Overall increase in the amount of new business [½]
The cost of capital rate could have increased by EIOPA [½]
Other regulatory changes [½]
Change in reinsurance arrangements [½]
Change in reinsurers, resulting in more reinsurance credit risk [½]
Outsource administration resulting in greater operational risks. [½]
Increase in operational risk capital due to operational failures, loss of key staff [½]
Change in attitude to future risk [½]

Anticipating higher future risk leading to higher expected future SCR [½]
Changes in the Board's risk appetite [½]
[Max 5]
[**Total Max 34**]

Part (i) was usually well answered. As well as providing the standard reasons as to how a critical illness policy might meet the needs of a customer, many candidates also commented on how the benefits provided the particular policy described, such as the guaranteed insurability option, might need customers' needs.

Part (ii) was similarly well answered, again with many candidates considering the risks associated with the actual benefits provided by the policy as well as the more generic risks.

Part (iii) was also generally well answered.

In part (iv) several candidates did not explain the calculation of the Risk Margin in sufficient detail. Few candidates discussed the possible simplified approaches that might be taken to project the SCR.

In part (v) the better candidates generated a good number of points by considering the various elements involved in calculating the Risk Margin and which ones, if altered and in which direction, would lead to an increase in the Risk Margin. Several candidates discussed factors that would have led to a fall in the Risk Margin. However, these gained no credit as the question only asked for reasons why the Risk Margin had increased.

Q2

(i) Need to consider the nature [½]
and term of the liabilities. [½]
For polices that are not in the claims in payment status, the liability outgo consists of:
Benefit payments + expense outgo – premium income. [½]
For claims in payment policies, the liability outgo consists of: Benefit payments + expense outgo. [½]
The expected liability outgo in any year, or month, depends on the monetary value of each of the constituents and the probability of it being received or paid out. [½]
Need to consider the insurer's risk appetite overall….. [½]
…..and the extent it is happy to take on certain types of risk…. [½]
…..e.g. market / credit risks [½]

Liabilities
The benefit payments can be sub-divided into two types:
Guaranteed in monetary terms — this consists of benefit payments where the amount payable is specified in the insurance contract in monetary terms. [½]
Guaranteed in terms of an index of prices, earnings or similar — this consists of benefits whose amount is directly linked to such an index. [½]
Expense payments tend to increase. The rate of increase is not strictly comparable to the rate of change in a price (or earnings) index, but for investment purposes it is adequate to treat it as being so. [½]
Hence they can be included with benefit payments guaranteed in terms of an index of prices or similar. [½]
Premium payments are usually fixed in monetary terms (or may be linked to an index) and hence can be thought of as negative benefit payments guaranteed in monetary terms (or in terms of a prices index or similar). [½]
The existence of contracts where the policyholder can choose the amount of premium to pay each year does not invalidate this. [½]
For liabilities that are guaranteed in monetary terms, the insurer will ideally want to invest so as to ensure that it can meet the guarantees. [½]
This means investing in assets that produce a flow of asset proceeds to match the liability outgo. [½]
This will also involve taking into account the term of the liability outgo, and hence the probability of the payments being made, so as to indicate the term of the corresponding assets. [½]
For liabilities that are guaranteed in terms of a prices index or similar, a suitable match would be securities that are linked to the same index in which the guarantee is denominated, if available, ideally chosen to match also the expected term of the liability outgo. [½]
In their absence, a substitute would be assets that are expected to provide a "real" return. [½]

Currency
Need to consider the currencies in which the liabilities are denominated. [½]
As this insurer writes business in the domestic market only, liabilities are likely to be denominated solely in the local currency and should be matched by assets in the same currency, so as to reduce any currency risk. [½]

Term

Need to consider the mean term of the assets and the liabilities. [½]
and the availability of assets by nature / term [½]
If the mean term of the asset income is longer than the mean term of the liability outgo, the financial soundness of the insurer will be adversely affected if there is a general increase in the level of interest rates. [½]
Conversely, if the assets' mean term is shorter than that of the liabilities, a decrease in interest rates in general will adversely affect the solvency. [½]
This does not mean that the mean terms of assets and liabilities must necessarily be equal. The insurer should, however, be aware of the consequences of departing from this matched position. [½]
The timing of the income on the assets and how this matches the liability would be considered. [½]
The benefits are monthly, regular payments but some assets will pay less frequently and may offer one-off larger sums (e.g. on redemption of a bond) that may cause reinvestment risk issues if excess income is received. [½]

Liquidity
Need to consider the insurer's liquidity requirements. [½]
If the insurer has a history of producing widely fluctuating levels of claims, it will be wise to maintain access to ready (liquid) funds. [½]
Even with reinsurance protection, the insurer will still be left with the obligation to pay the gross claims, perhaps far in advance of making recoveries from reinsurers. [½]
The growth or contraction of a portfolio of business will influence cash flow. [½]
If it is expected to contract then an insurer will not be in a position to pay its claims from incoming premiums. [½]
As this insurer has a growing portfolio, provided the insurer remains solvent, the use of incoming premiums to pay claims is an acceptable policy. [½]

Counterparty risk
The default of an organisation on which the insurer depends, such as a reinsurer or broker, will probably cause a sharp interruption in the expected cash flow. [½]
Failures will cause problems in the future as well, particularly in the case of a reinsurer that may be expected to provide an insurer with protection for several years into the future. [½]
An insurer may only recover a proportion of the funds for which it has budgeted. However, provided the shortfall is not immediate, it may be possible to realise assets in an orderly way and so minimise the adverse effects of selling at an inappropriate time. [½]

Capital requirements
Need to consider the effect of the capital requirements on asset selection. [½]
When deciding on the types of assets needed to cover the required capital, an insurer should avoid all significant risks. [½]
In fact the insurers are expected to be even more cautious and to plan their finances, including the structure of their investment portfolio, with the aim of holding maybe twice the statutory minimum even though the regulations do not require them to do so. [½]
This use of the free assets is most appropriate in regard to the assets backing the guaranteed benefits. [½]

The safest option is to hold fairly short-dated gilts because they offer relative security and low volatility of capital value in the market due to their imminent maturity date. [½]
The insurer would need to take into account any admissibility rules for assets [½]
And to consider the effect of free assets on asset selection. [½]
The insurer will have "free assets" (may be termed "free reserves" in a short term insurance company) which represent the excess of assets over liabilities. [½]
As mentioned previously, some of an insurance company's free assets must be held securely to cover its minimum solvency capital requirements. [½]
The excess will be available to invest in a way that is likely to produce a good long term return for the shareholders. [½]
It is important to realise that an insurer has a duty to the policyholders to invest wisely to protect its ability to meet its liabilities to them. However, a proprietary insurer also has a duty to its shareholders to sustain and enhance the return that it achieves on the assets over and above those that it retains to meet the minimum solvency capital requirements. [½]
This may mean that the insurer needs to invest some of its free assets long term in equities, both local and overseas, and perhaps in direct property investment as well if the scale of the funds available for investment is sufficient for it to build a diversified portfolio. [½]
The existence of the free assets enables the insurer to exercise a freer investment strategy than if the assets merely equalled the liabilities…. [½]
,,,,with the aim of achieving a higher long term return (i.e. not just investment freedom for the sake of it) [½]
However, the extent to which that freedom may be exercised will depend on the actual level of the free assets relative to the statutory solvency requirements. [½]

Other
Would need to consider the investment expertise available [½]
and the quality of the assets [½]
The relative expected return from particular assets and asset types [½]
The cost of dealing in particular assets [½]
Stress/sensitivity testing would be carried out [½]
[Max 10]

(ii) The board of directors is ultimately responsible for the risk management of an insurance company and ensures that key elements required for effective governance are in place including an organization structure that supports the execution of ALM. [½]
The board and senior management must demonstrate a strong commitment to ALM. [½]
The board and senior management are also involved and actively promote risk management culture. [½]
Boards of directors and other decision-makers need to be well educated on ALM. [½]
A senior level ALM Committee with a board approved mandate will need to be established. [½]
A board approved ALM Policy will need to be put in place. [½]
The board should also be satisfied that there is a strategic decision making framework in place for ALM and accountability for any management decisions to take market views or investment risks. [½]

The ALM Committee must have a senior composition. [½]
There should be a forum for strategic decision making. [½]
The people responsible for ALM must have the necessary professional expertise. [½]
There should be an adequate level of resources and well-trained professionals dedicated to the ALM function. [½]
Roles and responsibilities should be well-defined with clear accountability for the ALM function. [½]
Ensure all major ALM decisions are documented and approved at appropriate level [½]
Ensure clarity of which Boards / committees / senior management have authority to make ALM decisions, and the limits of the authority they have [½]
Have controls around investments taken, e.g. day-to-day trading [½]
Financial objectives should be well-defined within the ALM policy. [½]
Examples of financial objectives include maximising shareholder return, economic value, embedded value, earnings, Return on Equity ("ROE"), etc. [½]
Risk limits should be well-defined within the ALM policy. [½]
The insurer's risk tolerance within its enterprise risk management framework should be used to establish specific risk limits for each material financial variable. [½]
These risk limits should be defined in terms of appropriate risk metrics. [½]
In addition to an insurer's risk tolerances, there may be a number of internal or external constraints that must be considered (e.g. minimum capital ratio, maximum volatility of earnings, various investment guidelines, etc.) [½]
There is a need to monitor the liabilities being written and the assets purchased to ensure that the strategy is still suitable. [½]
The MCR would need to be monitored to ensure it continues to be met by suitable secure assets [½]
The ALM policy statement and procedures should be well documented and approved by the Board. [½]
The ALM Policy should be reviewed and approved on a regular basis (at least annually) by the board. This is an important governance tool for the Board. [½]
Measurement and monitoring of risk exposure should be included in management reports so that risk profiles can be clearly communicated to support decision making. [½]

[Max 4]

(iii) Restrictions on the types of assets in which an insurer can invest. [½]
Restrictions on the amount of any particular type of asset that can be taken into account for the purpose of demonstrating solvency. [½]
May require forced sale of assets of type X [½]
and/or requirement to buy assets of type Y [½]
A requirement to match assets and liabilities by currency. [½]
Restrictions on the maximum exposure to a single counterparty / country. [½]
A requirement to have independent custodian of assets….. [½]
….where the custodian has an appropriately high credit rating [½]
A requirement to hold a certain proportion of total assets in a particular class — for example government stock. [½]
There may be a regulatory requirement to allow for mismatching. This could involve the setting up of an investment mismatching reserve. [½]
A limit on the extent to which mismatching is allowed at all. [½]

The regulatory environment can also affect the choice of assets through their relationship with the investment assumptions used to value the liabilities. [½]
A particular asset selection may allow a company writing long term health insurance products to use a higher investment yield assumption and thereby reduce the value of the liabilities and increase the free assets. [½]
However, such asset selections may not necessarily enable the company to maximise the expected investment return. [½]
The more a company decides to invest in riskier assets with a higher expected return, the higher could be any such resulting reserve. This would increase the value of the liabilities and reduce the available free assets. [½]
The regulator can impose higher risk stresses / charge on riskier assets. This would increase the capital requirement and reduce the solvency ratio. [½]
Sanction or refusal to allow authorisation of senior managers involved in investment activities if they don't act in an appropriate way…… [½]
……or they are not suitably experienced / qualified for particular roles [½]
[Max 5]

(iv) As the investment will generate regular income over the long term, it should be a good match for the claims in payment liabilities. [1]
Depending on the upfront purchase price, this investment could potentially provide the insurer with higher returns than those on fixed interest bonds. [½]
The investor has full control over the pricing policy, which could further enhance future returns if traffic continues to rise over time. [½]
Similarly, if price inflation can be passed on to the toll road users, it will provide a good inflation hedge. [½]
The toll road represents a tangible asset, similar to a property investment. [½]
It should provide diversification to other asset classes, such as bonds, equity, property, etc. [½]
It is therefore also suitable as an investment for free assets. [½]
As this is a major toll road, it should be resilient to the economic cycle due to the inelasticity of demand. [½]
Building a toll road requires high initial capital investment and this acts as a significant barrier to potential competitors entering the market building an alternative road. [½]
This is an illiquid asset and the insurer may find it difficult to find a suitable buyer should it need to dispose of it quickly. [1]
Does company have lots of other liquid assets? [½]
Market value is not readily available, so it will be more complex to value such as using external valuation specialists or mark-to-model approach. [½]
If long-term cash flows turn out to be more volatile than expected, it may not end up being a good match to the claims in payment liability cashflows. [½]
Calculating capital requirements could also be more complex, as there is no readily available credit rating assigned to this asset. [½]
Using valuation and credit rating specialists will add to the costs of managing this asset. [½]
It is unclear what the risk charge will be applied for the capital requirement calculation, adding further complexity in the solvency capital requirement calculation. [½]
If the risk charge is penal, the additional capital requirement may outweigh the benefits of higher potential returns. [½]

Is it an allowable asset to back liabilities according to the statutory regulations? [½]
Are there any restrictions on whether the asset can back the company's capital? [½]
How is this asset likely to perform under stress conditions? [½]

The operation of a toll road will require significant level of management, and is subject to high operational risks. [½]
Management and maintenance of a toll road will require specialists, which will add further to the ongoing operational costs. [½]
Maintenance risk – unplanned maintenance costs such as unexpected damages to the toll road could reduce operating cashflow levels [1]
or result in no toll income for periods of time [½]

As this is a major toll road, it is likely to be essential functioning of the economy, and it is thus susceptible to political risks [½]
and regulatory risks [½]
Performance risk – actual usage could fall short of projected volume or price objective. [½]
The uncertainty is high as the project has only just been completed and there is no historical performance figures to support pricing. [½]

The Board of directors and other decision-makers need to be trained to understand such investment. [½]
Need to ensure that such an investment is in line with the insurer's ALM policy. [½]
Consider other alternative infrastructure assets, such as utilities, housing, healthcare facilities etc. [½]
As the insurer has never invested in this type of asset before, it is unlikely to have in-house management and valuation specialists. [½]
Concentration risk if the road forms a large part of the total assets [1]

The insurer would need to consider factors related to the features of the investment such as
Does the insurer have sufficient capital available to purchase the toll road? [½]
The payback period of the investment and how the return available compares to other available assets for the given level of risk [½]
What type of inflation could the income be expected to increase in line with e.g. RPI or something lower? [½]
How long will the toll be able to be charged - an initial period or the whole lifetime of the road? [½]
Does the insurer have the expertise to set an appropriate level of charge for the toll road? [½]

[Max 9]

[**Total Max 28**]

Part (i) was generally well answered. Candidates generally gave a good range of relevant points, although relatively few candidates discussed liquidity issues or counterparty risk in any detail.

Part (ii), which involved the practical implementation of asset liability management governance, was less well answered with candidates failing to provide a wide enough range of points to score well.

Part (iii) was reasonably answered. Candidates did not generally discuss that the regulator might impose higher risk stresses / charge on riskier assets, which would increase the capital requirement and reduce the solvency ratio or that the regulator might sanction or refuse to allow authorisation of senior managers involved in investment activities if they don't act in an appropriate way or were not suitably experienced / qualified for particular roles.

Part (iv) was generally well answered with candidates providing a good range of points. The better candidates applied asset liability principles to assess how suitable the asset might be in meeting and matching the liabilities of the income protection business written by the insurer. Few candidates discussed the liquidity aspects or the difficulty of calculating the capital requirements.

Q3

(i)(a) They may worry that standards of care change. [½]
This could lead to a change (for better or worse) in the morbidity and mortality of care home residents. [½]
Worse morbidity could lead to more intensive (and more expensive) care needs which would have to be paid for by the individual if their LTCI policy is not an indemnity one. [½]
Lower mortality would lead to longer lifetime in the care home which would have to be paid for by the individual if their LTCI policy is not an indemnity one. [½]
The standards of care could improve as the merged care providers will benefit from economies of scale [½]
And costs charged by the care homes may decrease. [½]
If costs fall following the merger this may help policyholders who have a fixed benefit product [½]
And reduce any contributions they may be required to make if costs are above the fixed benefit level [½]
Alternatively, costs charged by the care homes may increase. [½]
As the merged provider has more power in the market to increase its prices without losing clients [½]
If the LTC is indemnity then there is no problem for the insured. [½]
Some LTCI contracts indemnify care costs up to a limit. If the fees of the merged care provider go above the limit then the individual will have to fund the higher charges themselves. [½]
If not indemnity at all, then the individuals will have to fund any higher charges themselves. [½]
This could come from the remaining LTCI income if this is currently higher than the current costs of care. [½]
If not, this would be unpopular and the individuals may not have other funds with which to fund the additional costs. [½]
They may be forced to move to a cheaper home, which would be distressing for people in frail conditions. [½]
The merged company may decide to merge or close some of its homes [½]
Particularly if any are in very close proximity to one another [½]
Then some existing residents would need to move – this would be stressful and upsetting for them and their families. [½]
particularly if residents are moved further away from their families [½]
And fees for the replacement homes may be higher than currently, which the LTC policy may not cover fully [½]
There may be no impact for those receiving care at home. [½]
[Max 7]

(i)(b) They have less choice of care home provider following the merger [½]
unless the provider decides to keep the two brands distinct. [½]
If they already have in mind a care home for their future care then they would closely watch to see if it belongs to the merged company, and monitor: [½]
- Standard of care relative to other providers [½]
- Cost of care relative to other providers [½]

Depending on the flexibility of the LTC contract, e.g. does it allow them to choose their own provider or are they obliged to go with one according to the insurer's rules, they may come to value their LTC contract more or less. [½]

This will also depend on whether the insurer changes its terms following the merger. [½]
Pre-funded LTCI could be reviewable so if the insurer does change the premium or benefits in order to reflect new care home fees from the merged provider then the policyholder will be impacted. [½]
This could lead to policy lapses, [½]
especially if policyholders can surrender and get their money back, at least partially. [½]
Alternatively, if the merged care provider has a good reputation then it could increase customer satisfaction amongst the existing policyholders [½]
e.g. they may feel more secure that a large and well-established provider is available. [½]
and lead to fewer policy lapses [½]
Their view will depend whether the LTC policy indemnify the future care costs or pays pre-defined amounts. [½]
And the proportion of costs covered by the state benefits [½]
And the reputation and standards of care of the newly merged provider relative to other providers in the market. [½]
The geographic location of homes in the merged provider is important in terms of the proximity to potential new policyholders' locations of residence. [½]
There will be no impact at the time of claim on ADL tests [½]
Or the administration of premium payments etc. [½]
[Max 5]

(ii) The insurer will need to consider the effect on demand for LTCI products [½]
And the costs of providing these, if the benefits include an element of indemnity [½]
And the effect on expenses [½]
Some plans seek to immunise the policyholder from future care cost escalation by pre-agreeing benefit escalation rates with a specified list of nursing homes [½]
The insurer would need to understand the new fees for the merged care homes. [½]
And consider if it should offer LTCI on an indemnity basis, indemnity with limits, or predefined income level. [½]
If the LTC is indemnity this will be an issue for the insurer. [½]
Higher care costs may lead to losses on this LTC portfolio for the insurer. [½]
If premiums are not reviewable, if costs are expected to be higher this could lead to significant losses for the insure [½]
There may be scope to set a deal between the insurer and the merged care provider to fix the care fees for its insured members in future, or limit the increases. [½]
Whether or not the LTCI product is indemnity, the insurer will have reputational exposure to the quality of care delivered to policyholders by long term care providers. [½]
Therefore the insurer will want to understand if the quality of care will change as result of the merger. [½]
And the perceived attractiveness of the care provider in the market [½]
And reputation for standards of care [½]
Versus alternative providers. [½]
Any change in care levels may impact on mortality or comorbidity and hence on the profits of the insurer. [½]
The insurer needs to ensure that the policyholder understands that it is not responsible for the quality of care or any failure by the home to honour the agreement. [½]

If policyholders are forced to move to a cheaper home, this could lead to complaints against the insurer [½]
Which could lead to reputational damage. [½]
Does the LTC policy allow any provider or only those from a specified list? [½]
Does the insurer perform quality checks on the providers? [½]
Having one less provider may simplify some processes for the insurer, such as fee payments, as there will be one less provider to pay. [½]
If expected costs of care will increase should the insurer increase its premiums [½]
or lower its benefits [½]
For both pre-funding policies and immediate needs? [½]
If expected costs were to fall due to economies of scale then premiums could fall [½]
Future increase costs of care could change, impacting premiums [½]
Increased uncertainty could increase capital requirements [½]
Should the insurer offer different premiums if the care is to be provided by this provider rather than any others [½]
The insurer would need to consider the geographic location of homes in the merged provider and proximity to potential new policyholders' location of residence [½]
The insurer may need to refocus its distribution efforts if care home closures are concentrated in certain areas. [½]
The mix of business may change, particularly geographic mix [½]
There may be implications if the State support changes as a result of the change in market providers [½]
If costs rise, the insurer will require additional reserves and capital [½]
There is increased counterparty risk as fewer providers [½]
And diversification between providers is reduced. [½]
Lapse experience may change [½]
e.g. persistency may improve if premiums are decreased [½]
If lapses increase, the insurer would expect a worse claims experience (either through earlier inceptions or longer durations) [½]
The insurer would need to consider what competitors are doing, particularly around premiums, in order to retain its competitiveness [½]

[Max 6]

[**Total Max 7**]

This question required students to apply their knowledge to a particular situation and to consider some of the issues involved from the point of view of the insurer and the hospital. Candidates generally failed to provide a wide enough range and number of points to score well on all parts of the question.

Part (i)(a) involved assessing the impact of the merger from the point of view of those already in care. The better candidates discussed issues such as if costs increased following the merger if policies provided indemnity, there would be no increased costs for the policyholder but if fixed amounts or indexed benefits were provided, the policyholder may need to fund part of the cost or move homes. Few candidates discussed that if care homes were closed following the merger, existing residents may have to move care home or that there would be no impact on people receiving care in their own homes.

Part (i)(b) was not well answered with few candidates providing enough points to score well.

Similarly part (ii) was not well answered with many candidates failing to provide a wide enough range and number of points to score well. Most candidates mentioned that costs might increase, in which case if policies provided some form of indemnity premiums may increase or benefits may be reduced. However few candidates discussed issues such as changes in lapse experience, the effects on reserves and capital requirements, increased counterparty risk, actions of competitors.

Q4

(i) Underwriting - not necessary as all applicants must be accepted. [½]
and it is not possible to increase the premium for an individual consumer to take account of any additional risk [½]
It is like an obligatory group contract in this respect. [½]
No underwriting costs at policy inception [½]
However, possible significant additional costs may be incurred by the insurer to attract new business [½]
e.g. marketing / sales costs [½]
Risk for each insurer that they attract a portfolio of insured lives who are less healthy than the average life. [½]
and hence make a loss [½]
They could target the healthier lives (low risk cohorts) through their marketing and sales process, if this is allowed in the country. [½]
They may be able to offer different benefits to different groups of people whilst keeping the premiums the same for all [½]
The risk of anti-selection is not significant since all lives must seek health insurance cover [½]
Population data can be used for risk analysis. [½]
Exposed to moral hazard – all residents of the country would be fully aware that they have full health insurance and so may not take such good care of their own health compared to if they had had the choice to buy health insurance. [½]
Unnecessary treatments – patients may expect or demand treatments which are clinically unnecessary but which are widely known to be available [½]
or may choose more expensive treatments [½]
Availability of provision - if there are only a few providers they may increase prices [½]

Average claim costs are spread over all policyholders [½]
E.g. young and old; smokers and non-smokers; healthy and unhealthy [½]
On average, the older members of the population are being subsidised by the younger generations who are healthier [½]
The unhealthy lives are subsidised by the healthy lives [½]
Smokers are subsidised by non-smokers (*credit was given for other suitable examples of cross-subsidisation*) [½]
The premium would be a significant proportion of income for some people and less so for others [½]
I.e. there is no differentiation of premium based on income levels or wealth [½]
The insurers would be concerned if this leads to the less wealthy being unable to afford the premiums and defaulting on the premiums. [½]
The insurer may still be obliged to provide full health cover even in these circumstances [½]
The insurers may engage in a premium war with a "race to the bottom", i.e. reducing premiums in order to win market share. This could lead eventually to one insurer going insolvent and/or bankrupt. [½]
The government may need to intervene to stop this from happening. [½]
The two insurers could be tempted to form a price-fixing cartel, unless there are regulations and governance to prevent this. [½]
The insurers could compete using other factors – e.g. financial strength, more salesmen on the ground etc. [½]

It is not clear whether the required PMI covers all possible medical costs or only very specific costs. If it is only specific costs the policyholders may be able to buy additional cover and the insurer may be able to make more money on the additional cover [½]
The profitability of the business for each insurer could be very different (even if the same premium charged) [½]
e.g. due to differences in expenses, overheads, experience etc. [½]
The insurers will need to optimise the level of premium or mix of business and volumes [½]
[Max 6]

(ii) Advantages

Steadier income stream [½]
Ability to expand operations [½]
Which could lead to economies of scale, i.e. unit cost savings [½]
Ability to hire more staff [½]
Helps it to attract and retain the best staff (doctors, nurses, managers, etc.) [½]
Which would enable it to provide better care to patients [½]
If cost saving passed on to the customer via lower premiums from Select Insurance then Orchard Hospitals could see its services being used more [½]

Disadvantages

The income for each service provided by Orchard Hospitals to patients insured by Select Insurance would decrease. [½]
Therefore, if all other things (e.g. patient mix) remain equal, Orchard Hospitals would have lower income overall. [½]
Orchard Hospital will be subsidising Select Insurance profits if Select Insurance keeps the customer premium the same, and retains the cost saving [½]
A flat 10% reduction may not be appropriate depending on the actual mix of services that Orchard ends up providing [½]
Reduction in charges may leave the business non-profitable [½]
Complexity of charging different prices depending on which insurer is paying [½]
May need to make administration system changes to handle this [½]
Possible conflict of interest as it is financially more attractive to treat patients covered by Everywhere Insurance Plc, who pay the higher prices per service, whereas all patients should be treated equally [½]
Could attract more patients than existing staff or infrastructure can physically handle. [½]
The patients would be a subset of the insured portfolio of Select Insurance. If Select Insurance has a portfolio that is less healthy than the average lives in the population then Orchard Hospitals will likely receive more patients per population. [½]
There are many examples of disparities like this., e.g. Select Insurance may have
More women of child-bearing age – leading to demand for more maternity services [½]
More smokers – leading to demand for more lung and breathing treatments [½]
More children – leading to demand for more paediatric services [½]
I.e. The operational planning by Orchard Hospitals will need to consider the mix of lives covered by Select Insurance. [½]

People living near to hospitals in the Orchard network are more likely to choose Select Insurance as it is more convenient for them to use than those in the Forest Hospitals network. [½]
May strain relationship with Everywhere Insurance. [½]
May end up having to give same discount to Everywhere Insurance [½]
or Everywhere Insurance may stop using Orchard Hospitals altogether and negotiate a deal with Forest Hospitals [½]
[Max 5]

(iii) Advantages

Lower claim costs per person [½]
Hence ability to charge lower premiums [½]
And gain a greater market share whilst still making a positive profit margin [½]
Higher volumes could lead to economies of scale, i.e. lower unit costs [½]
Higher volumes would improve the reputation of the leadership and management of Select Insurance [½]
Leading to higher profits overall [½]
Alternatively, make higher profit margin if the current premiums are kept unchanged [½]
But unlikely to increase volumes this way [½]
May give the insurer some influence over the management of the Orchard Hospitals [½]
And the opportunity to influence the treatment [½]
And possibly raise care standards [½]
Or identify efficiencies and thereby reduce costs. [½]
Orchard Hospitals may be known to provide higher standard of care already so it is a huge selling point to offer a product that allows treatment only at this provider [½]
Geographic location of hospitals compared to the population – ease of access [½]
Select Insurance may have its headquarters close to one of the Orchard Hospitals so allowing it to work easily with the management and staff there [½]
Less administration – direct payments to one provider only makes things simple [½]
PMI requires expert staff and specialist systems. [½]
There is a need to have strong relationships with hospitals and consultants, as their costs and behaviour in deciding upon medical treatment will directly impact the claims cost. [½]
May benefit from lower reinsurance rates as expected claim costs reduced [½]
People living near to hospitals in the Orchard network are more likely to choose Select Insurance as it is more convenient for them to use than those in the Forest Hospitals network. [½]

Disadvantages

Its insured lives may end up receiving lower quality care if the Orchard Hospitals identify which patients are coming from Select Insurance and generating lower fees. [½]
E.g. they de-prioritise these patients for treatment so they have to wait longer [½]
This would damage the reputation of Select Insurance. [½]
If the residents of the region around the Orchard Hospitals are in worse health than the average lives in the country then Select Insurance will increase its exposure to high risk lives. [½]

If Forest Hospitals management finds out about the arrangement then it could adversely affect any relationship between Forest Hospital and Select Insurance [½]
There is increased counterparty risk if Orchard Hospitals go bankrupt [½]
The insurer will have to pay higher fees [½]
Customers could still prefer using Everywhere Insurance – e.g. if Everywhere has better service, higher financial strength etc [½]
[Max 6]

(iv) Advantages

Lower premiums (assuming the insurer passes the savings on to the policyholder). [½]
Clear that only one provider so only one organisation to deal with [½]
So no difficult choices at time of needing treatment. [½]
For people who live closer to an Orchard Hospital than a Forest Hospital, there would be little/no advantage in having access to Forest Hospitals. [½]

Disadvantages

Lack of choice of provider [½]
Particularly if Forest Hospitals offer some services that are not available at Orchard Hospitals [½]
Although it is smaller, it may have some niche specialists. [½]
If Orchard Hospitals has a reputation for offering a lower standard of care then it would be bad. [½]
Service could be poor from Orchard Hospitals' staff as they may be too complacent [½]
For people who live closer to a Forest Hospital than an Orchard Hospital, there would be inconvenience in having to travel further to an Orchard Hospital. [½]
[Max 3]
[**Total Max 20**]

This question required students to apply their knowledge to a particular situation and to consider some of the issues involved from the point of view of the insurer, the hospital networks and policyholders.

Part (i) was not well answered. In particular, a number of candidates appeared not to have fully understood the context of the question, in particular that having a PMI policy is compulsory for residents and so did not consider the consequences of this in answering the question. Few candidates discussed targeting healthier lives, or issues relating to moral hazard or the affordability of premiums.

Part (ii) was better answered. However, few candidates discussed the potential problems of charging different rates depending on which insurer s paying, or that the patients would be a subset of the insured portfolio of Select Insurance, who may be less healthy than the average lives in the population.

Part (iii) was less well answered. Only the better candidates discussed that there would be less administration with direct payments to one provider only making things simpler or that the insurer would have the opportunity to influence the management of the hospital and treatments provided or raise care standards. The latter may be important if the

insured lives received lower quality care as this would affect the reputation of Select Insurance.

Part (iv) was reasonably answered although only the better candidates discussed the disadvantages of the policies not providing access to the Forest Hospitals network.

END OF EXAMINERS' REPORT