

# INSTITUTE AND FACULTY OF ACTUARIES

## EXAMINERS' REPORT

September 2021

### **SP2 – Life Insurance Specialist Principles**

#### **Introduction**

The Examiners' Report is written by the Chief 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.

Sarah Hutchinson  
Chair of the Board of Examiners  
December 2021

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

The aim of the Life Insurance Specialist Principles subject is to instil in successful candidates the principles of actuarial planning and control, and mathematical and economic techniques, relevant to life insurance companies. The candidate should gain the ability to apply the knowledge and understanding, in simple situations, to the operation, on sound financial lines, of life insurance companies. The life insurance products covered by this subject exclude health and care insurance products covered by the Health and Care Specialist Principles subject.

The Examiners' Report covers more points than would be expected to get full marks. This is so that alternative approaches to questions by different candidates can be accommodated. The Examiners may also award marks for valid points that are not included in the marking schedule.

Candidates are expected to show knowledge of the relevant content of the Core Reading, and be able to apply this knowledge where appropriate.

**B. Comments on *candidate performance in this diet of the examination.***

The limited elements of the paper which required direct application of the core reading were generally answered very well which is to be expected given the open book nature of the exam.

With the exception of the direct application parts mentioned above, few candidates scored full marks on any question parts – on average around half marks were scored. Full marks are not expected for the average candidate both given the time available and as questions are set to ensure there is sufficient 'headroom' in terms of available marks for stronger candidates to differentiate themselves.

Stronger candidates performed well by providing both additional breadth and detail in their responses. Candidates that demonstrated this detail consistently throughout the paper would be expected to generate a passing mark.

**C. Pass Mark**

The Pass Mark for this exam was 55  
404 presented themselves and 164 passed.

## Solutions for Subject SP2 – September 2021

### Q1

It is true that a lot of expenses are proportional to the number of policies in force	[½]
So it is reasonable that expenses could be split by product type	[½]
since direct expenses are those that apply directly to a specific product	[½]
This approach could be simple to calculate and understand	[½]
Expenses should be split into initial, renewal and terminal	[½]
However not all expenses are proportional to the number of policies	[1]
Marketing expenses may relate to the amount of commission paid	[½]
which may vary in line with the size of benefit or size of premium	[½]
As commission is likely to vary by premium size, it may not be appropriate to allocate across all policies equally	[½]
Underwriting expenses may vary based on the size of benefit	[½]
as larger contracts are likely to require more underwriting	[½]
Investment expenses are likely to be dependent on the level of funds under management, rather than the number of policies	[½]
Product types may not be a sufficiently granular split	[½]
regular and single premium variants of a product may attract different expenses	[½]
a unit-linked product may offer different funds which incur different levels of expense	[½]
Different generations of policies within the same product may have different experience, so a product-level allocation may not be reasonable	[½]
Taking this approach could mean expense assumptions are not sufficiently detailed to reflect characteristics of the product	[1]
If this approach is used in pricing this could have implications for determining profitability/correct premiums	[½]
and may understate risks associated with business mix	[½]
If this approach is used in reserving the projected expenses may not reflect the nature of the business, meaning reserves could be over- or understated	[½]
Whether the approach is simpler than the current approach will depend on what the current approach is	[½]
A change from current approach may make trend analysis difficult	[½]
The proposed approach could lead to unreasonable results, e.g. allocated expenses exceeding premiums	[½]
which could make the products uncompetitive	[½]
As the employee is new, they may be suggesting an approach that was appropriate for their previous company, but not this one	[½]

[Marks available 13½, maximum 6]

*This question requires consideration of the pros and cons of the suggested approach, plus details on where the approach would not be appropriate. Most candidates identified examples of expenses that were likely to vary across policies but gave limited detail. Better prepared candidates also considered the wider implications of adopting this approach on the business, and considered both the pros and cons rather than just the limitations in the approach. No marks were awarded for consideration of overheads given these are not included in direct expenses.*

## Q2

High lapses at the short term, particularly in year 1 may indicate issues with the products marketing or documentation	[½]
or training of salespeople and hence mis-selling	[½]
if the product does not meet the expectations given to policyholders at point of sale (e.g. affordability)	[½]
Alternatively the high lapses may be due to churning of business by advisors if the product is sold on commission	[1]
lapse spikes in years 1, 2 or 4 may coincide with the end of a commission clawback period	[½]
There is a spike of lapses in year 4	[½]
which may be driven by a policy event at that duration, e.g. removal of surrender penalty (any sensible example)	[½]
There is a spike of lapses in year 10	[½]
which may be driven by a policy event at that duration, e.g. a guaranteed surrender value, removal of penalty	[½]
this would also explain the lower lapse at year 9 (as policyholders hold on for the event at year 10)	[½]
and the lower lapse in year 11+ onwards	[½]
It is also possible that some, or all of the features are due to random fluctuation	[½]
particularly if volumes of the product in a given year are low	[½]
(this may be true in later years due to the high initial lapses)	[½]
In addition, there will always be a base level of lapses due to changing policyholder circumstances (e.g. years 5-9)	[½]
If the contract has an investment element, it is possible for certain terms to appear to have worse value due to investment return to date	[½]
if returns had been good up until the last few years, only more recent contracts may experience an overall loss in value	[½]
If lapses are measured by policy size (rather than volume of policies), then a small number of large policies lapsing could distort the results	[½]
If the experience is vastly different from previous investigations this could be down to error, and may need to be investigated	[½]

[Marks available 10, maximum 6]

*This question was fairly well answered with most candidates able to generate a number of examples as to why lapse rates are as shown in the question. Stronger candidates considered the features of lapse rates at different durations in turn and suggested reasons for each duration, instead of providing generic comment on overall lapse rates.*

## Q3

(i)

Investment restrictions	
The regulator could limit the types of assets in which a life insurance company can invest	[½]
Restrictions on asset classes, e.g. require lower-risk classes	[½]
Introducing investment limits (e.g. concentration or counterparty limits)	[½]

Mismatching	
The regulator could require an investment mismatching reserve	[½]
Alternatively the regulator may directly limit the extent to which mismatching is permitted	[½]
Valuation of liabilities	
The regulator could restrict the amount of any type of asset that can be taken into account for the purpose of demonstrating solvency	[½]
Alternatively it could influence the choice of assets indirectly by determining the permitted valuation yields, meaning certain asset allocations lead to lower liabilities although this approach may lead to sub-optimal investment choices	[½]
Valuation of Assets	
Restrictions on the method used to value assets for regulatory purposes (e.g. book rather than market value)	[½]
Minimum reserve/solvency requirements	
The regulator could increase the strength of reserves required	[½]
or introduce minimum reserve requirements	[½]
or introduce minimum solvency capital requirements	[½]
Guarantees	
There could be restrictions on the use of investment guarantees	[½]
Other Considerations	
The government may introduce prescriptive regulation or principles-based regulation	[½]
They may use tax rules to influence the level of risk	[½]
	[Marks available 7½, maximum 5]
(ii)	
Limiting contract types	
The regulator could limit the types of investment contract that can be sold	[½]
or restrict the range of investments that can be offered within a contract	[½]
They could set out maximum or minimum percentages that must be held in specific asset classes	[½]
Potentially a minimum sum assured could be introduced to ensure some protection	[½]
Point of sale	
The regulator may specify the type of information that the insurer needs to provide at the point of sale to highlight the risks of the contract to the customer	[½]
and/or specify that certain levels of advice should be provided	[½]
possibly by limiting the permitted sales channels for investment products	[½]
Post sale	
The regulator may specify the level of post-sale communication that is required through regular statements giving measures of risk / return	[½]
Tax	
The company may encourage/discourage types of contract via taxation	[½]

[Marks available 5, maximum 3]

[Total 8]

*Part (i) draws directly on bookwork and as such was reasonably well answered with most candidates able to provide points around investment restriction, mismatching, and valuation of liabilities.*

*For part (ii) answers varied - better prepared candidates considered the pre-sale, point of sale, and post-sale restrictions in order to generate sufficient points.*

#### Q4

##### Price comparison vs direct sales

The company does not have experience in marketing products directly rather than through comparison sites [1]  
 meaning there are greater risks associated with this approach [½]

##### Product design

The company may want or need to revise its product offering [½]  
 in order to differentiate from the products sold via comparison websites [½]  
 Selling via social media may allow the company to sell less standard products than it could via comparison sites [½]  
 although product complexity will need to be limited due to lack of advice in this channel [½]  
 The company should consider whether they can access appropriate expertise in this channel [½]

##### Marketability

The company will be able to access a target market it is not currently in touch with which may boost sales volumes [1]  
 They will need to carry out sufficient market research to assess viability [½]  
 Social media advertising allows for targeted advertising at a specific demographic so the company can have more direct control of where and how its products are marketed [1]  
 There is a risk that the new sales channel reduces sales from the comparison website (i.e. doesn't actually generate distinct new business) so it needs to be carefully targeted / made sufficiently distinct [½]

##### Competitiveness

This approach may be competitive if not explored by competitors [½]  
 however if the market is already saturated, may lead to limited success [½]  
 Products will have to be competitively priced vs the comparison site equivalent unless a different product offering is used [½]

##### Profitability

The company should consider whether business from the new channel will meet their minimum profitability requirements [½]  
 They must consider the overall impact on profitability (i.e. volumes\*margin) [½]  
 There may be cross-subsidies between the two channels [½]

### Financing Requirements

Advertising via this approach is likely to be competitively priced	[½]
but may be higher than the current approach of using price comparison sites	[½]
Cost may well be based on a “per click” approach	[½]
meaning costs are more controlled and better linked to the viability of the advertising approach	[½]
However there will be initial setup costs in researching and entering into an advertising agreement	[½]
Costs of setting up the company structure to deal with and manage the new sales channel may be considerable, given the company only sells via comparison sites at present	[½]
There will be costs incurred in training staff in the new distribution channel	[½]
There will be costs incurred in producing new literature	[½]

### Demographics

The company will not have any experience data for pricing in the new channel	[½]
it may be able to adapt its existing experience data	[½]
or use data from reinsurer or industry	[½]
however this depends if it is targeting a similar demographic with a similar product	[½]

### Business Mix

This may differ to the existing channel (e.g. younger target market, different economic status)	[½]
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### Regulation

Regulation may limit or restrict the ability of the company to use this approach either now or in the future	[½]
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### Reputation

Association with the social media platform may have negative connotations for the insurer, due to the actions of the social media platform or how it is perceived	[½]
allegations of data gathering (any sensible example)	[½]
Likewise if the advertising is poorly planned or badly targeted, this may lead to negative coverage or loss of business	[½]

### Experience

There may be lapse and re-entry risk if policyholders could obtain better terms through the new channel	[½]
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### Underwriting

The level of underwriting may need to change	[½]
detailed underwriting may not be feasible if there is a large target market (any sensible example)	[½]

[Marks available, 20, maximum 10]

*The basic elements of this question were fairly well answered with scope for better prepared candidates to score higher marks. Most candidates were able to note some of the*

*implications of differences between the distribution channels and the cost of implementation. Better prepared candidates addressed specific points around possible issues of using social media and noted that the company would lack both data and experience.*

**Q5**

(i)

The volumes of new business could have been different to expected	[½]
in one or both products	[½]
The business mix may have been different to expected	[½]
A different mix of volumes between the two products	[½]
or a different mix within each product by age, policy size, gender, investment fund mix, distribution channel	[½]

[Marks available 2½, maximum 1]

Pricing may have changed during the year for competitive or other reasons	[½]
changing the profit margin on policies on one or both products	[½]
Expenses may have been different to the assumptions used in pricing. e.g. commission payments may have been higher or lower than expected	[½]
Investment returns or investment-linked charges may be different to those assumed in Pricing	[½]
Actual persistency experience may differ from that assumed at the start of the year	[½]
Actual mortality experience may differ from that assumed at the start of the year	[½]
Expectations of future experience may now differ from previous assumptions.	[½]
Cost of capital requirements may be higher than anticipated	[½]
The actual products sold may differ from what was set out in the plan (e.g. new products or new designs)	[½]
The company may have purchased or changed reinsurance on the term assurance product	[½]
There may have been regulatory or tax changes	[½]

[Marks available 12½, maximum 4]

(ii)

The company may choose to stop selling the product	[½]
though this may then also lead to the individual pensions product being less profitable as there are less policies to spread fixed costs over	[½]
They could look at increasing the pricing to increase the profit margin	[½]
this could be by targeting rate increases in certain age, sex, sum assured segments where increases in price might not be expected to reduce volumes	[½]
otherwise price increases could result in volume reduction which could counteract the profit increase	[½]
They could look to increase the profit margin by reducing expenses through efficiencies	[½]
or introduce a minimum premium	[½]
If they use reinsurance they could look to review the reinsurance limits to optimise profit this way	[½]
Or look to use reinsurance if not already utilised.	[½]

They could analyse profits by distribution channel and target increased volumes from those that are more profitable	[1/2]
or review commission rates	[1/2]
They could try to increase volumes by looking to cross-sell to their individual pensions policyholders	[1/2]
or look to increase volumes in the more profitable segments, e.g. by targeted marketing though this could increase costs	[1/2]
or increase volumes by making the product more attractive by adding rider products though the cost of adding these would need to be counteracted by increased premiums in order to assist overall profitability	[1/2]
They could look to optimise the capital position, e.g. look at the assets backing the liabilities to increase return and so reduce the cost of capital increasing the profit	[1/2]
They could reassess their profitability requirements to determine whether the required return is still appropriate	[1/2]
They could implement actions to improve future mortality experience	[1/2]
e.g. increased underwriting, improved claims management (any sensible example)	[1/2]
They could implement actions to improve future persistency	[1/2]
e.g. improved customer service (any sensible example)	[1/2]
They may choose to improve volumes at the cost of a reduced profit margin, to increase overall profitability	[1/2]
e.g. by improving distribution channels	[1/2]
The company could perform a more detailed analysis of surplus to better understand the drivers of the loss and update future assumptions accordingly	[1/2]
	[Marks available 12½, maximum 6]
	<b>[Total 10]</b>

*Both parts were generally well answered, with better prepared candidates covering a range of experience differences in part (i), and covering actions to improve experience in part (ii).*

## Q6

(i)

### Passive Valuation Approach

Approach is relatively insensitive to changes in market conditions	[1/2]
Valuation basis is updated relatively infrequently	[1/2]
net premium valuation approach	[1/2]
Assumptions may be “locked in”	[1/2]
they remain unchanged from those used when policy was first written	[1/2]
It could be a requirement that non-economic assumptions are updated if experience worsens	[1/2]
in order to recognise the related loss, and higher reserves needed	[1/2]
Passive valuation approaches tend to be more straightforward to implement	[1/2]
involve less subjectivity	[1/2]
and result in relatively stable profit emergence	[1/2]

[Marks available 5, maximum 4]

(ii)

Life companies will need to redesign their valuation models	[1/2]
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conduct more detailed experience analyses	[½]
and change analysis of surplus processes	[½]
possibly raise additional capital	[½]
All of which will require extra costs	[½]
for staff	[½]
for training	[½]
for modelling/IT	[½]
Ongoing costs will also need to be considered	[½]
There will be a one off change in the solvency results	[1]
which will need to be explained to analysts	[½]
and to regulators	[½]
There will probably be a need to conduct two valuations - one on passive approach	
and one on the new active approach before the change is implemented	[1]
there may be a long time lag before implementation	[½]
The solvency capital requirement regime will need amending	[½]
to be more risk based	[½]
this will give more information enabling better management	[½]
it will add to costs/modelling	[½]
The results, once implemented, will be more volatile	[1]
The change in method may lead to companies changing the products on offer	[½]
possibly removing guarantees and options	[½]
There may be a change in investment strategies	[½]
which could lead to a sell off of certain assets (e.g. equities)	[½]
and a change in investment matching	[½]
They may need to consider the approach for asset valuation	[½]
and implications for solvency requirements	[½]

[Marks available 14½, maximum 9]

**[Total 13]**

*Part (i) is largely available from bookwork and was well answered – noting this part of the question only asks about reserves so no marks were available for discussing assets or solvency requirements.*

*Part (ii) required candidates to provide considerable detail to generate the marks available. Better prepared candidates gave specific details on the operational issues with implementing the required changes. Marks were available for asset and solvency requirements in this section.*

## Q7

(i)

We are to show that dividends =  $V(0) \cdot (1+i)^t - S \cdot q^t + P \cdot (1+i)^t - E \cdot (1+i)^t - V(1)$  [2]

We know the expected value ( $V'(1)$ ) at the end of the year is:

$V'(1) = V(0) \cdot (1+i) + P \cdot (1+i) - S \cdot q - E \cdot (1+i)$  [2]

Rearranging Profit

Profit =  $V(0) \cdot (1+i)^t - S \cdot q^t + P \cdot (1+i)^t - E \cdot (1+i)^t - V'(1) + (V'(1) - V(1))$  [½]

Substituting  $V'(1)$

Profit = $V(0) \cdot (1+i'') - S \cdot q'' + P \cdot (1+i'') - E'' \cdot (1+i'') - [V(0) \cdot (1+i) + P \cdot (1+i) - S \cdot q - E \cdot (1+i)] + (V'(1) - V(1))$	[1/2]
Rearranging	
Profit = $V(0) \cdot (i'' - i) + P \cdot (i'' - i) + [E \cdot (1+i) - E'' \cdot (1+i'')] + S \cdot (q - q'') + (V'(1) - V(1))$	[1/2]
Where $V(1) = V'(1) \cdot (1 - q'') / (1 - q)$	
Or $V'(1) = V(1) \cdot (1 - q) / (1 - q'')$	[1/2]
Because the basis has not changed	[1/2]
So $(V'(1) - V(1)) = V(1) / (1 - q'') \cdot (1 - q - (1 - q'')) = -V(1) / (1 - q'') \cdot (q - q'')$	[1/2]
So Profit = $V(0) \cdot (i'' - i) + P \cdot (i'' - i) + [E \cdot (1+i) - E'' \cdot (1+i'')] + (q - q'') \cdot (S - V(1) / (1 - q''))$	[1]
$V(1) / (1 - q'')$ is the reserve for a single policy and as such the dividend = profit	[1/2]
	[Marks available 8½, maximum 6]

(ii)

The dividend will have to treat customers fairly and meet policyholder's reasonable expectations	[1/2]
There may be differences between the individual items in the dividend calculation and the aggregate items	[1]
For example the actual death claims may not be the same as the sum of the $q'' \cdot S$ because it is not possible to fit the actual deaths exactly to a table	[1/2]
or the $q''$ 's are smoothed	[1/2]
For example the actual expenses may not be the same as the sum of the $E''$ because of timing	[1/2]
because of policy grouping	[1/2]
any reasonable reason	[1/2]
Investment returns may not equal the aggregate of those allocated	[1/2]
due to timing differences in:	[1/2]
premiums	[1/2]
expenses	[1/2]
deaths	[1/2]
as these are assumed to occur at a single point in time	[1/2]
it may be difficult to calculate the accurate investment return	[1/2]
due to when assets are sold and gains are made	[1/2]
Any change in basis may mean the two do not match	[1/2]
The company may deliberately keep some profits back	[1/2]
to allow for a positive terminal dividend	[1/2]
to protect against adverse future experience	[1/2]
The profits share may include other items	[1/2]
such as commissions	[1/2]
tax	[1/2]
profits or losses from other areas of the business	[1/2]
one-off items of profit	[1/2]
The dividend may reflect surplus brought forward, or over declaration of past surplus	[1/2]
The dividend may have been adjusted to be consistent with competitors	[1/2]
The dividend may be smoothed	[1/2]
e.g. to avoid adverse reaction to low dividend (or sensible example)	[1/2]
e.g. to avoid setting a precedent with high dividend (or sensible example)	[1/2]

[Marks available 16, maximum 7]

**[Total 13]**

*Part (i) required the use of algebraic substitution in order to provide the answer – an approach the candidates may not have used for some time. It is extremely difficult to determine the way forward without being aware of the precise method required and as such many candidates skipped this question entirely. This was the most difficult question on the paper and as a result only a small number of candidates gave partial or full solutions to the question and were awarded marks accordingly. Credit was given whether or not death claims were included given these were not mentioned in the question, and for use of a forward proof rather than the solution suggested above.*

*Part (ii) was fairly well answered, with most candidates identifying the reasons why the company would actively distribute differently from the formula (e.g. smoothing, terminal dividend). Better prepared candidates considered a wider range of points and considered how individual elements of the formula could differ.*

### Q8

(i)

Appropriation Price:

Value of assets on offer basis PLUS Expenses that would be incurred in purchase	[½]
PLUS Current Assets MINUS Current Liabilities PLUS Accrued Income MINUS	
Accrued Tax	[½]
DIVIDE by number of units	[½]
$(2025000 + 22500 + 15000 - 20000 + 7500 - 5000) / 145000$	[½]
= 14.10345	[1]

Expropriation Price

As for appropriation price except replace value of assets with the market value on a bid basis	[½]
And replace adding expenses that would be incurred on a purchase with deducting those that would be incurred on a sale	[½]
$(2000000 - 17500 + 15000 - 20000 + 7500 - 5000) / 145000$	[½]
= 13.65517	[1]

(Marks available 5½, maximum 4)

(ii)

Given fund is expanding then company will use offer basis	[1]
Bid price will be based on appropriation price	[½]
Bid price when rounded will be 14.104	[½]
Offer price will be appropriation price x 1.025 (or $\text{appropriation price} / (1 - 0.025)$ )	[½]
Offer price will therefore be 14.457 (or 14.466 if using 14.10345/0.975)	[½]

[Marks available 3, maximum 2]

(iii)

Appropriateness of approach

The company should consider whether this is the best approach or whether an alternative approach could be used instead or in addition	[½]
e.g. policy fees, amcs	[½]
which may better match the expenses being incurred	[½]

Specifically, a fixed 3% charge may not be appropriate for all funds (e.g. overseas assets)	[1/2]
Alternatively it may be possible to reduce expenses and remove the need to increase charges	[1/2]
The company should fully understand the financial impact of the change, perhaps through modelling	[1/2]
<b>Initial Charge</b>	
Increasing the initial charge will increase the offer price but will not affect the bid price	[1] [1/2]
Therefore will only affect unitholders buying into the fund	[1/2]
which as fund is expanding may be appropriate for company	[1/2]
but will not help if fund starts to contract	[1/2]
<b>Rounding</b>	
Moving to rounding in favour of customer would mean rounding the offer price down and rounding the bid price up	[1] [1/2]
So any change would only affect the offer price, which would reduce slightly but unlikely to mitigate any increase from the initial charge increase	[1/2] [1/2]
other than for funds with low prices	[1/2]
<b>Proposal</b>	
The company would need to ensure any change is in line with policy documentation	[1/2]
The level of initial charge and rounding policy may be set out in the policy conditions	[1/2]
It will need to contact all policyholders and potential negative publicity	[1/2] [1/2]
and may lead to withdrawals from the funds	[1/2]
or worsening persistency	[1/2]
existing policyholders may be less inclined to invest new funds, which could lead to higher volume of policies becoming paid up.	[1/2]
The company would need to consider if such a proposal was in line with competitors if the initial charge is currently lower than competitors then it may be seen as bringing the company into line	[1/2] [1/2]
but if the charge would now be higher then this could lead to adverse publicity and potential surrenders	[1/2]
and may have an adverse impact on new business volume	[1/2]
rounding policy change may be driven by need to treat customers fairly	[1/2]
as such all regulation and professional guidance must be followed	[1/2]
The company would need to ensure distribution channels are aware of the changes	[1/2]
The company will need to consider administration and unit pricing system changes and potentially any changes to policy documentation	[1/2] [1/2]
and any changes to fund literature and websites	[1/2]
and training of staff	[1/2]
They will need to make sure there are sufficient resources for dealing with enquiries/complaints following the proposed changes.	[1/2]
Any necessary actions/changes will incur costs	[1/2]
The implementation plan for any proposal would need to be carefully considered	[1/2]
the day on which the changes are implemented would show an increase in offer prices of around 0.5%	[1/2]
which may lead to fund performance statistics being distorted - if they used	[1/2]

offer prices

[½]

[Marks available 20½, maximum 11]

**[Total 17]**

*Most candidates were awarded full marks on part (i) which was a relatively straightforward application of a bookwork formula.*

*Part (ii) was also well answered but required explanation of the approach and appropriate use of rounding to gain full marks.*

*Part (iii) was reasonably well answered, with most candidates able to generate points around the impact the charge would have on policyholders, plus some of the practicalities of implication. Better prepared candidates considered the impact of the initial charge and rounding separately and identified how the impacts would feed through to bid/offer price.*

## Q9

(i)

The reinsurer can provide technical assistance or expertise [1]

by providing experience data as the insurer has no experience of this product [½]

which can help with pricing the contract [½]

And they can help designing the product to reduce the risk [1]

The insurer can transfer risks to the reinsurer [½]

to reduce the volatility and uncertainty [½]

over the length of annuity payments [½]

and manage the capital better [½]

The reinsurer may help with underwriting [½]

Reinsurance may reduce new business strain or ease the burden of development costs [½]

A reinsurance arrangement may enable the insurer to benefit from other tax or regulatory regimes [½]

[Marks available 6½, maximum 4]

(ii)

Risk premium [½]

Quota share reinsurance [½]

But could also be considered a longevity swap [½]

[Marks available 1½, maximum 1]

(iii)(a)

Insurance company risks

Counterparty risk [½]

risk that the reinsurer becomes insolvent [½]

and the insurer still has to pay the annuity [½]

Legal risk [½]

risk that the reinsurance treaty is not robust [½]

and does not cover what the insurer expects [½]

for example care home fees inflation may not be covered [½]

risk of dispute with the reinsurer, resulting in costly legal bills for the insurer [½]

Operational risk [½]

the insurer has to pay the care home fees are paid on time	[½]
which will require the reinsurer paying the insurer promptly	[½]
there is reputational risk if late payment from reinsurer leads to fees being paid late	[½]
Mortality risk	[½]
if the policyholder dies sooner than expected	[½]
the insurer still needs to keep paying the reinsurance premium based on the expected life expectancy	[½]
Expense risk	[½]
e.g. risk that care home fees are lower than the level reflected in the premium due to fee increases or inflation, meaning the reinsurance is poor value (any sensible example)	[½]
Regulatory risk	[½]
e.g. the regulator changes which types of reinsurance arrangements may be used, or introduces restrictions in level of reserves (any sensible example)	[½]
	[Marks available 9½, maximum 5]

(iii)(b)

Longevity risk	[½]
that the policyholder lives longer than assumed in the reinsurance contract pricing due to developments in medical treatment	[½]
so the reinsurer continues paying the care home fees beyond the last reinsurance premium date from the insurance company	[½]
Risk of poor underwriting leading to worse longevity experience than expected.	[½]
Inflation risk	[½]
but the inflation assumption in the pricing was lower than actual inflation	[½]
Expense risk	[½]
risk that maintaining the reinsurance agreement is more costly than the reinsurer had assumed	[½]
risk that care home fees are higher than the level reflected in the premium due to fee increases or inflation	[½]
Operational risk	[½]
insurer does not provide up-to-date information on risks.	[½]
Investment risk	[½]
the reinsurer now has the risk that assets are not available to match the long term liabilities	[½]
New business risk	[½]
NB is higher/lower than expected (sensible example)	[½]
	[Marks available 8, maximum 3]

(iv)

Increased longevity risk	[½]
as increased life expectancy will mean the care home fees are paid for longer than assumed in the pricing by the insurance company	[½]
The longevity impact will depend on the availability of the new treatment to the wider population	[½]
This will impact the profitability of the contract	[½]
and the impact of inflation will be greater due to longer duration of payments	[½]
As the single premium the policyholder paid initially may not be sufficient	[½]
However these will be limited due to the reinsurance arrangement	[½]
As the insurer is only at risk for 20% of the annuity	[½]

If the life expectancy assumed by the reinsurer in their pricing was less than the new life expectancy	[½]
as the insurers reinsurance premium payments may end before the policyholder dies and the reinsurer will make a loss on the contract	[½]
The insurer may reprice the contract which could mitigate some of the impact on future business	[½]
but could result in changes in business mix or volume	[½]
potentially making the contract less affordable	[½]
Likewise the reinsurer may reprice the reinsurance which could mitigate some of the impact on future business	[½]
by passing some cost to the insurer, which could change the insurers assessment as to the value of the reinsurance	[½]
The reinsurance arrangement may come to an end	[½]
Investment risk as they will need assets to match the duration of the increased life expectancy	[½]
Both the insurer and reinsurer will need to increase their reserves	[½]
	[Marks available 9½, maximum 4]
	<b>[Total 17]</b>

*Parts (i) and (ii) relied directly on bookwork and were generally well answered, with most candidates scoring full marks.*

*Part (iii) and (iv) both required the candidate to identify the differences in how the treaty would affect the insurer and reinsurer, and better prepared candidates were able to identify the main differences and provide details from both perspectives rather than providing a more generic answer regarding risks for this type of contract.*

**[Paper Total 100]**

**END OF EXAMINERS' REPORT**