

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2017

Subject ST2 – Life Insurance Specialist Technical

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.

Luke Hatter
Chair of the Board of Examiners
July 2017

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

1. The aim of the Life Insurance Specialist Technical subject is to instil in successful candidates principles of actuarial planning and control, and mathematical and economic techniques, relevant to life insurance companies. The student 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 Technical subject.
2. 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. Candidates are expected to show knowledge of the relevant content of the Core Reading, but those who tailor their answer to the specifics mentioned in the question will score more highly than those who answer in a more generic way.
3. Candidates who give well-reasoned points or examples, not in the marking schedule, are awarded marks for doing so.
4. In this diet the scoring for the exam was done out of 200 and therefore the mark scheme shows a total of 200 marks available for the paper.

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

As with previous papers, questions that focussed on knowledge of the Core Reading were well answered by well-prepared students. In the higher mark application questions, candidates tended to restrict themselves by generating only a narrow range of points rather than thinking more widely, e.g. questions 2 part (ii), 3 part (i) and 4 part (ii). Stronger candidates considered the specifics of the question and used these in their answers e.g. in question 4 part (i) and 5 parts (ii) and (iv).

C. Pass Mark

The Pass Mark for this exam was 60.

Solutions

- Q1** (i) To ensure the results from the solvency valuation are accurate. [2]
To meet supervisory/regulatory requirements or avoid regulator intervention. [1]
To ensure that embedded value calculations are accurate. [1]
To provide appropriate insights to the company in order for it to make strategic or business decisions. [1]
e.g. decisions on investments, reinsurance or asset shares [1]
To allow it to perform accurate experience investigations. [1]
To allow products to be re-priced or priced accurately... [1]
... in order to avoid making losses or excessive profits. [1]
To reduce data risk. [1]
To allow it to hold lower risk margins. [1]
And therefore to allow it to use capital more efficiently... [2]
... and sell more business... [1]
... or make higher profits. [1]
To ensure that administration is accurate and efficient. [1]
e.g. to ensure payments are correct to customer and reinsurers and avoid bad reputation [1]
[Max 8]
- (ii) The company needs to ensure that the data obtained for historic years (if the investigation includes such data) is consistent with the same data used in the previous year's investigation. [1]
The exposure data would need to be reconciled to the previous year... [1]
... by policy count or sum assured [1]
As: $\text{Data before} + \text{New business} - \text{Business leaving} = \text{Data now}$ [2]
The corresponding death data also needs to be checked... [1]
.... split by the rating factors used by the insurance company. [1]
Comparisons should be made against the numbers of deaths in previous investigations. [1]
For the most recent year's data, comparisons should be made against independent internal sources. [1]
For example, the amount of sum assured on death in the investigation data should be comparable to the revenue account death claim amount. [1]
As the data will be split by rating factor, it is important to check that these have been recorded accurately [1]
So need to check for unusual values [1]
Such as very large or zero sums assured paid on death [1]
Or impossible dates of birth or commencement date [1]
Or error in possible smoker status or gender entries [1]
Ratios of sum assureds to premiums or average sum assureds may be inconsistent [1]
Grouping data and looking for clustering should also be considered [1]
e.g. clustering by birth month [1]
Spot checks may be performed on the data... [1]
... against other sources e.g. paper administration files [1]

A comparison of the resultant mortality rates, once determined from the analysis, should also be made against those in previous years. [2]
 Check the surplus from mortality against that expected [1]
 Large variations would not be expected from one year to the next under normal circumstances. [1]
 The comparison can be done at an aggregate level or by rating group, depending upon the level of data available. [1]
 However, if there has been a significant business change then the experience may vary noticeably. [1]
 For example, to the target market or sales distribution channel... [1]
 ... or underwriting approach... [1]
 ... or due to a major epidemic. [1]
 Comparisons of the resultant mortality rates may be made against industry information. [1]
 [Max 16]
 [Total Max 24]

This question was largely knowledge-based and was answered fairly well by most candidates. The strongest candidates considered a wide range of points in part (ii) including both consistency and spot checks.

- Q2** (i) Risk-free rates are usually term dependent so a yield curve would be required... [2]
 ... to cover the whole duration over which the liabilities are expected to run off. [1]
 They are usually determined based on government bond yields... [2]
 ... of appropriate duration which matches that of the liabilities [1]
 Depending on the country an adjustment may be applied to allow for credit risk to get to a risk-free return. [2]
 Alternatively swap rates may be used... [1]
 if the market is sufficiently deep and liquid, i.e. the market is large enough [1]
 [Max 6]
- (ii) Assets:
- The assets valued at market value represent a market consistent valuation [2]
 Therefore the value of £2m should be used for the assets [1]
- Liabilities:
- Market consistent valuation is the value a third party would pay to take on the liabilities [1]
 In a market consistent valuation future cashflows are valued consistent with market values... [1]
 ... where a corresponding market exists [1]
 For conventional without profits liabilities like this, this methodology can be replicated by... [1]

... using a discount rate which is based on a risk-free rate of return ... [2]
... irrespective of the actual type of asset held [1]
It is therefore not appropriate to use the liabilities valued using the actual yield on assets held for the market consistent valuation [1]
It may be acceptable to use the liabilities valued using a risk-free discount rate and best estimate assumptions, so £1.92m could be a starting point. [2]

However, as the assets held are corporate bonds... [1]
... it may be possible to take credit for the illiquidity premium [2]
The \$0.05m difference between the risk-adjusted discounted valuation of the assets relative to the market value suggests that there is some illiquidity in these bonds. [2]
The use of an illiquidity premium is normally restricted to long term predictable liabilities... [1]
... for which matching assets can be held to maturity. [1]
Annuities matched by appropriate corporate bonds meet this criterion. [1]
Although the value of the liabilities on a risk-free return is available, there is no valuation with an appropriate liquidity premium [1]
Therefore an appropriate liquidity premium needs to be derived [1]
This could be done through comparing the yield difference implied by the market valuation of assets and the discounted valuation [2]

Using best estimates for the other liability assumptions may not be market consistent [1]
But best estimate may be a good starting point. [1]
Ideally, the liabilities should be valued using best estimate assumptions with a risk margin... [1]
...as compensation for the inherent risk. [1]
Therefore an appropriate risk margin needs to be derived. [1]
This would require additional information about the volatility of each relevant assumption. [1]
This margin should be included for elements of the basis for which a deep and liquid market does not exist... [2]
... which for this company are longevity... [1]
... and expenses. [1]
This may be done by applying the margin to each such assumption [1]
Or by including an overall reserving margin in respect of those risks [1]
For example by using the “cost of capital” approach [1]
This would require additional information about the capital requirements for each of these risks... [1]
... and a cost of capital rate assumption [1]

If the market consistent valuation is being done for supervisory or regulatory purposes, then there may be other rules that have to be followed ... [2]
... which would influence the appropriate choice of liability value. [1]

[Max 18]

- (iii) In a market consistent valuation there would be no change to the risk-free rate that would be used [2]
 As the liabilities are no longer appropriately matched by duration... [1]
 ... it is unlikely that a liquidity premium could now be held [2]
 This would result in the discount rate being based on the risk-free return alone with no illiquidity premium held [1]
 Which would reduce the discount rate used to value the liabilities (assuming that an illiquidity premium was previously used) [1]
 Which would increase the liabilities [1]
 A mismatch reserve may be required which would also increase liabilities [1]
- There would be no change to the value of the assets [1]
 So overall the surplus assets would reduce [1]
- However, if no illiquidity premium was previously assumed then the liabilities would stay unchanged... [1]
 ... and the surplus assets would also be unchanged [1]
- [Max 8]
 [Total Max 32]

This question was only answered well by a minority of candidates. Most candidates covered the points in part (i) of the two different approaches but the strongest candidates mentioned term structure. The same can be said of part (ii) where only stronger candidates considered an illiquidity premium and few expanded sufficiently on points to gain higher marks. In part (iii) only the strongest candidates referenced the illiquidity premium where most believed the asset value would change instead.

Q3 (i)

(a) Age

- This would be a suitable item to analyse the experience by. [2]
 People tend to change jobs more frequently when they are younger... [1]
 ...or may use the internet more and so be more active to transfer. [1]
 ... and so may transfer their pension arrangements if younger. [1]
 People at younger ages may have less disposable income... [1]
 ... and hence may be more likely to make their pensions paid-up [1]
 As people approach their retirement age, they are more likely to try to simplify their overall pension arrangements ... [1]
 ... and so, if they have a number of pension arrangements, may transfer them to one arrangement. [1]
 Or may take their lump sum or early retirement to an annuity. [1]

(b) **Smoker status**

This data may have been collected at entry if there is a significant selected death benefit associated with the policy. [1]

It is highly unlikely that the smoker status of a customer will influence the decision to transfer their pension or their retirement decision. [1]

Therefore, it is unlikely to be appropriate to analyse withdrawals by this metric. [2]

However, it is possible that those in poor health would be less likely to be able to continue to pay premiums [1]

Or may wish to take early retirement [1]

So if there is sufficient data, paid-up rates could be analysed by this metric [1]

(c) **Distribution channel**

Persistency experience can vary significantly depending on distribution channel... [1]

... hence it is an appropriate factor to use in an analysis. [2]

This is due to differences in the underlying socio-economic status of different target markets [2]

e.g. higher paid-up rates from those with lower socio-economic status due to affordability (*or any sensible example of how socio-economic status relates to persistency rates*) [1]

e.g. higher socio-economic status typically expected from use of insurance intermediaries than other channels (*or any sensible example of how socio-economic status relates to distribution channel*) [1]

And because different distribution channels will have different levels of activity in terms of encouraging individuals to transfer to other companies [2]

E.g. insurance intermediaries will be active in finding alternative products which have lower charges therefore higher withdrawal rates (*or any sensible example*) [1]

And because different distribution channels may take different degrees of care in ensuring that the product sold is suitable [1]

The more suitable the product, the lower will usually be the withdrawal experience [1]

Particularly at early durations [2]

E.g. more likely to be better persistency in this regard for insurance intermediaries than for direct marketing (*or any sensible example*) [1]

The company will spend a significant amount on distributing products... [1]

... either directly or through commission. [1]

It is very important, therefore, to monitor the persistency of business written through a particular distribution channel ... [1]

...and check is in line with the assumptions in the pricing... [1]

... if these expenses are not recouped via an initial charge and/or withdrawal penalty [1]

If the actual persistency experience is better than expected in the pricing and hence results in higher than expected profits, then the company may choose to divert more effort to that channel. [1]

- If it is worse, then it may choose to alter the terms offered through that channel... [1]
 ... or withdraw from it entirely. [1]
 Credible volumes of data in subgroups would be required to do the analysis [1]
 [Max 18]
- (ii) Individual and group, if relevant [1]
 Duration in force [1]
 Size of premium [1]
 Size of unit fund [1]
 Frequency of premium [1]
 Premium payment method [1]
 Original or outstanding term [1]
 Gender [1]
 Socio-economic proxy e.g. location/occupation [1]
 [Max 6]
- (iii) **The economic situation** [1]
 If the economic experience has been poor, then the investment returns achieved by the policy may have been poor. [1]
 Customers therefore may wish to stop paying further premiums. [1]
 Or transfer to a different provider. [1]
 Alternatively, the economic situation may affect the personal circumstances of the customer. [1]
 For example mortgage rates may increase leaving them unable to pay the premiums for the company's product [1]
 Or they may lose their job and be unable to continue to afford to pay premiums into the policy. [1]
 Equally, the opposite to the above could be true in positive economic situations. [1]
- The competitive situation** [1]
 If a competitor introduces a new product that has more attractive features... [1]
 ... such as guarantees.. [1]
 ... or lower charges... [1]
 ... customers may decide to transfer their fund to the new product. [1]
 Alternatively, a competitor may offer more attractive investment options... [1]
 ... or market itself as having better investment performance. [1]
- Equally, the opposite to the above may lead to improved persistency. [1]
 If there has been a regulatory sanction at a major competitor... [1]
 ... or they have suffered poor publicity, this also may lead to improved persistency. [1]
- Perceived value of the product to the customer** [1]
 If the customer feels that they no longer are gaining sufficient financial value from the product, persistency will worsen [1]
 e.g. when compared to competitors products it may not seem value for money [1]

E.g. due to the introduction of alternative types of retirement savings contracts [1]

The design of the product [1]

Higher surrender penalties may improve persistency (*or vice versa*)... [1]

... or changes in levels of penalty over the duration of the policy may increase lapses at specific break points [2]

If the contract allows flexibility in terms of premium payment, then this may improve persistency [1]

If there are any guarantees existing or options available on the contract (e.g. at maturity) then this may improve persistency [2]

The degree of "moneyness" of any guarantees/options will also affect persistency experience [1]

Legislative or regulatory change [1]

The pension industry tends to be significantly controlled by legislation and regulation... [1]

... including taxation... [1]

... and also in relation to government incentives to save for retirement. [1]

Changes in those controls and incentives could change the behaviour of customer. [1]

E.g. relaxing or removing the current surrender (for cash) restrictions. [1]

This may lead to a one off increase in exits. [1]

It may also lead to different ongoing experience once the situation has stabilised. [1]

Changes to State pension provision may also impact persistency rates for personal arrangements. [2]

The perceived reputation of the company [1]

Bad publicity could increase lapse rates. [2]

For example, regulatory censure. [1]

The company may introduce another product themselves which detract from this product. [1]

[Max 18]

[Total Max 42]

This question was fairly well answered with most candidates covering a good range of points in all three parts. In part (i) stronger candidates gave more specific examples in parts (a) and (c) considering why persistency may vary by these factors. Part (ii) was well answered by all. In part (iii) most candidates covered a good breadth of points with the stronger candidates expanding on each of them.

- Q4** (i) This product looks complex... [2]
... and appears to be aimed at customers with a high level of financial sophistication... [1]
...who may prefer face to face sales methods which also lend themselves to explaining the complexities of the product. [1]

There will be a cost of setting up the channel as the company is new... [1]
...e.g. insurance intermediaries will require payment by commission [1]
Members of an own sales force are usually employees of the company. [1]
The company would therefore have to set up the sales force and related infrastructure to support it. [2]

The company would need to consider the likely persistency experience before agreeing a channel. [1]
E.g. likely higher lapses through the direct channel and lower via intermediary [1]

Insurance intermediaries

- Because the product is complex, it will require specialised advice. [1]
The product having unique features suits this channel as it differentiates from other products the intermediaries may sell. [1]
Both at the time of sale ... [1]
... and at later periods when changes may be required to premiums or the sum assured or the unit funds. [1]
Insurance intermediaries are focussed on meeting the needs and situation of their clients. [1]
And they provide ongoing advice for a fee. [1]
They are therefore typically used by customers who have a higher than average level of sophistication (i.e. this target market).... [1]
,, and hence maybe more affluent and willing to pay fees (or a higher premium) for the advice [1]

This would therefore be an appropriate means of distribution. [2]
However, training on the product can be harder to provide to IFAs than to tied agents/own sales force. [1]

Tied agents

- Tied agents offer only the products of the company to which they are tied. [1]
Therefore, since it looks like this is the only product the company sells... [1]
... it is unlikely to have tied agents... [1]
... who would want a more diverse product range to offer. [2]

However, if tied to more than one company, then it can be the case that mutually exclusive products are offered. [1]
In which case, this may then be a possible distribution channel. [1]

Own sales force

This is also unlikely to be an appropriate distribution channel... [2]

The own salesforce also sells only the products offered by the company... [1]

... so may not be viable due to the restricted product range. [1]

Members of an own sales force are usually employees of the company. [1]

The complexity of the product may not suit this target market. [1]

Direct marketing

This is typically done without the customer being present or without any direct or tailored advice [1]

For example via mailshots, telephone sales, press adverts, internet selling [1]

It is unlikely that this would be a suitable distribution approach. [1]

However, the company may choose to use some of the approaches to promote itself [1]

For example via social media [1]

Particularly since it is a new company and may wish to raise brand awareness. [1]

[1]
[Max 20]

- (ii) A restriction on the types of contract that a life insurance company can offer could directly impact this product. [2]

This product is both savings and protection and as such could be subject to complex regulatory constraints... [1]

... even to the degree that the product in its current form is not allowable. [1]

It may have to include or exclude certain features to avoid such a restriction applying to it. [1]

Restrictions could be imposed on the charges that can be used for this type of product [2]

This could mean that the company may need to alter the design to comply with the restrictions and meet its profit targets. [1]

Restriction could be imposed on rating factors ... [1]

... that can be used to calculate the mortality charges, if used, for the guaranteed minimum sum assured... [1]

... for example gender or age. [1]

However since this would be applicable to all companies this should not impact competitiveness. [1]

Requirements could be imposed relating to the terms and conditions of the contracts offered [1]

For example with regard to how surrender values are to be calculated [1]

Or how often the flexible premiums / sum assured are allowed to changed [1]

Or how often switches are permitted between funds [1]

Restrictions could be imposed on the channels through which the product may be sold [1]

Or requirements as to the procedures to be followed or the information required to be given as part of the selling process [1]

There could be restrictions on remuneration allowed for sales channels, e.g. commission restricted [1]

This could influence the design, e.g. may need to make it simpler [1]

Restrictions could be imposed on the ability to underwrite... [1]

... for example a prohibition on the use of the results of genetic testing... [1]

... or prohibition of use of past claims history or medical history. [1]

This could have an impact on the guaranteed death benefit feature... [1]

... but is unlikely to have a significant impact. [1]

There could be an indirect constraint on the amount of business that may be written... [1]

... e.g. via capital requirements. [1]

If the features of this product meant that capital requirements were particularly high, this could impact the design of the product. [2]

There could be investment restrictions on the types of assets that a life insurance company can invest in... [1]

...or restrictions on the assets customers are allowed to invest in. [1]

There could be investment restrictions on the amount of any particular type of asset that can be taken into account for the purpose of demonstrating solvency [1]

... both could therefore impact the range of unit funds offered to the customer. [2]

Other investment restrictions could be imposed on the extent to which mismatching is allowed, the derivation of the valuation yield, and the extent of mismatching reserves. [1]

However, these are unlikely to have a significant impact on the design of the product... [1]

... since the main reserves where asset allocation is part of the product design are likely to be the unit fund... [1]

... and this can be matched to ensure the assets can be offered. [1]

Regulatory restrictions on other types of savings and investment providers (e.g. banks) could also have a significant effect on the design of the product... [1]

... in order to exploit any advantage that a life insurance company would have. [1]

[Max 24]

[Total Max 44]

The main points of part (i) of this question were covered by most candidates though stronger candidates stayed focussed on the question and didn't spend excessive time explaining the features of each channel, instead focussing on why they would be appropriate or not. In part (ii) candidates who did well considered a wide range of restrictions and did so in a life insurance environment rather than keeping it more general.

- Q5**
- (i) Renewal expenses [1]
 Surrender expense [1]
 Expense inflation [1]
 Benefit inflation, if index-linked [1]
 Mortality/longevity [1]
 ... including future longevity improvements [1]
 Interest rate/investment return on backing assets/discount rate [1]
 [Max 6]
- (ii) **Expenses**
- Either expenses used in pricing... [1]
 ... Or based on more recent analysis [1]
 Particularly if the policy has been in-force a while [2]
 Original pricing expenses were set assuming no surrenders and so they may be increased to allow for lower expected volumes if surrenders happen in addition to deaths [1]
 There is no direct experience to base the surrender expense on [2]
 Could look to another product which currently allows surrenders... [1]
 ... as processing may be similar [1]
- Inflation**
- Base on future inflation expectations within the economy for the relevant index [2]
 Or for example on the difference between index-linked and fixed interest bond yields [1]
 Expense inflation may be weighted towards salary rather than price inflation [2]
 Should be consistent with the discount rate / interest rate assumption [2]
 May simply use the pricing assumption for policies which have been relatively recently sold [1]

Mortality

- The starting point is likely to be a standard mortality table [1]
- .. with an adjustment for experience [1]
- Pricing assumptions may be much less relevant here [1]
- There is a risk that policyholders will select against the company... [2]
- With those that are least healthy choosing to surrender... [1]
- ...as the cash lump sum is best value for them [1]
- And those in ill health are more likely to want or need a lump sum to use now [1]
- Or those with smaller annuities may be more likely to want to surrender as the annual annuity amount may make little difference to them [2]
- Such annuitants are likely to be relatively less financially sophisticated [1]
- Overall it is therefore likely that those surrendering will have heavier mortality than used in the standard pricing [2]
- Could base on experience analysis split by annuity size [1]
- Or analysis of the difference between impaired annuity mortality and standard [1]
- Future mortality improvements may be allowed for in accordance with industry practice [1]
- However, may decide not to allow for future mortality improvements due to the selection issue [2]
- Likely to monitor and refine the mortality assumptions over time [2]
- Will have to balance fairness to policyholders in giving them a fair value whilst protecting the company from the selection risk [1]

Interest rate

- Likely to use pricing assumptions... [1]
- ... based on backing assets [1]
- Likely yields on government or maybe some corporate bonds [1]
- With an appropriate adjustment for credit risk for the latter [1]
- May use index-linked bond real yield for linked annuities to avoid the need for a separate benefit inflation assumption [1]
- May include a margin for the risk that the expected yield cannot be realised... [1]
- ... due to early encashment, since would have expected to hold most investments to maturity originally [2]

Margin

- The company may include a margin for uncertainty [1]
- This could be at an overall level or a margin on individual assumptions. [1]
- e.g. a margin on expenses would work to decrease the expense assumption [1]
- e.g. a margin on interest rate would work to increase the rate and so reduce the SV [1]
- The overall impact of the assumptions should consider that the resulting SV need to be reasonable and fair to policyholders. [1]

As surrender values have not been offered on annuities before there is uncertainty around a lot of the assumptions [1]
[Max 20]

- (iii) What competitors are doing/offering may have an influence [2]
Industry pressure may force it to offer the surrender values [1]
It may suffer reputational damage if it does not offer them [2]
Surrender values may become comparable across the industry and so be a factor when customers are considering the annuity at the new business stage [1]
The company could therefore lose market share / new business volumes could fall if it doesn't offer them (*or vice versa*) [1]
Which would reduce its total profits (*or vice versa*) [1]

It may be the case that the legislation will become stronger in future so that it has to offer surrender values at some point anyway [2]

However, there is a lot of uncertainty about the experience of those taking surrenders given they haven't been offered to date. [1]
Particularly in relation to the level of mortality selection which will take place [1]
And so the company could make a loss given this uncertainty [1]
There is an additional risk as there is no underwriting for surrenders [1]
Offering surrender values would require greater liquidity [1]
If the company chooses to hold cash reserves to cover the uncertainty in the liquidity requirements, this would reduce returns [2]

There may also be poor publicity if surrender values are offered but are deemed to be unfairly low value [1]
Therefore the company may choose not to offer surrender values in order to reduce its risks [2]
Particularly if it has a low risk appetite [1]
Or relatively low capital [2]
There are also the costs of implementing the changes to systems etc. [1]

It may decide not to offer them immediately but to see how the market responds [1]
The company may offer surrender values if they believe they can make a profit in doing so. [1]
If surrender values are offered to enforce they should also be offered to new business to ensure fairness [1]
The company may want to offer surrender values if they are looking to run off the annuity book. [1]
[Max 10]

- (iv) **Profit**
The company will not want to make a loss on these alterations [2]
The terms after alteration should be supportable by the earned asset share at the date of alteration [2]

- Whilst an annuity doesn't typically have a traditional asset share... [1]
 ... the company will hold some form of regulatory reserve for each policy... [1]
 ... likely on a prospective basis [1]
 If the reserve for the altered policy is higher than the current policy reserve
 then this will be at a cost to the company [1]
 There may be margins in the assumptions used to calculate these reserves... [1]
 ... but no allowance for future profit [1]
 Ideally the profit expected from the contract after alteration should be the
 same as that of the original policy [2]
 Or alternatively the same as the expected amount had the policy been written
 originally on its altered terms [1]
 The company may want to make some allowance in the alteration terms for
 any difference in expected profit. [1]
- In addition some assumptions may be different for those likely to alter than for
 the customer base as a whole [2]
 In particular, mortality [2]
 And so a reserve for an individual policy, when considering it standalone, may
 be different to one calculated on the standard reserving basis [1]
 The company will want to allow for this when calculating supportable
 alteration terms [1]
 If the alteration involves payment of an additional premium, this should be on
 terms consistent with what would be charged for a new policy which provides
 just the additional benefits. [2]
- Small increases in benefits should attract only a small additional premium. [1]

Underwriting

- The company may want to underwrite some of the alterations [2]
 Particularly if the alteration adds short-term life cover [1]
 The cost of this underwriting should be factored into the alteration terms [1]

Consistency

- Alteration terms should avoid the option of lapse and re-entry [2]
 If the company does also offer surrender values... [1]
 ... then the alteration terms need to be consistent with what the customer
 could obtain by surrendering and taking out a new policy [1]

Cost

- The costs of doing the alteration should be factored into the alteration terms. [2]

Ease

- The surrender value should be easy to calculate [1]
 [Max 14]

- (v) Addition of second (joint) life [1]
 Removal of second (joint) life [1]
 Addition of other dependant [1]

	Change to index-linked annuity from level	[1]
	Change to level annuity from index-linked	[1]
	Change fixed escalation rate	[1]
	Change payment frequency	[1]
	Change to an impaired life annuity	[1]
	Change to a fixed term rather than whole life annuity	[1]
	Addition of a top-up premium	[1]
	Taking a partial withdrawal	[1]
	Defer payments	[1]
		[Max 4]
(vi)	Newly married	[1]
	Divorce or death of spouse	[1]
	New child or step-child	[1]
	Annuity income not keeping pace with increasing cost of living over time	[1]
	Expected need for higher benefits in the short term in real terms than in later life	[1]
	Income increase rate isn't meeting needs required or is too large	[1]
	Income being used for different purpose to original e.g. for annual holiday rather than monthly income or other income source is not as large as expected therefore this is used for monthly top up	[1]
	Change in health status but not wanting to take the risk of full surrender	[1]
	Another source of income (e.g. company pension) now expected after a certain period	[1]
	The policyholder may have additional money to invest and the annuity rates may be attractive meaning they want to obtain a higher guaranteed income	[1]
	The policyholder is in need of cash but wishes to retain some longevity protection	[1]
	The policyholder has come into additional money, e.g. inheritance, and so doesn't require the annuity payments at present	[1]
		[Max 4]
		[Total Max 58]

This question was generally not that well answered. Part (i) was well covered by most but in part (ii) only the strongest candidates focussed on the relevant assumptions and what sources may be relevant to help set them. The basic points were covered by most candidates in part (iii) but only the stronger ones expanded on them to gain further marks. In part (iv) stronger candidates considered the specifics of the question and made points relevant to an annuity. In parts (v) and (vi) most candidates were able to come up with some relevant alterations and possible reasons for these.

END OF EXAMINERS' REPORT