

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2018

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 2018

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.

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 4 part (ii) and 5 part (i). Stronger candidates considered the specifics of the question and used these in their answers e.g. in questions 2 part (ii), 6 parts (i) and (iv) and 7(i).

C. Pass Mark

The Pass Mark for this exam was 60.

Solutions [Note the marking is done out of 200]

- Q1** Both the premium and benefit are increased under the revalorisation method... [1]
... whereas only the benefit is changed under the contribution method. [1]
The revalorisation method applies the bonus as a percentage of reserve... [1]
... whereas the contribution method pays a dividend in cash... [1]
... or it may be converted into the form of a paid-up benefit. [1]
Contribution method more equitable (due to grouping of data) [1]
A terminal bonus can be distributed under the contribution method. [1]
The contribution method therefore tends to have more flexibility in terms of when bonuses are distributed. [1]
Only surplus related to profits from assets are generally distributed to policyholders under the revalorisation method... [1]
... with "insurance profit" typically going to shareholders... [1]
... whereas all sources of profit are generally distributed under the contribution method... [1]
... including assets, mortality and expense profits. [1]
[Maximum 10]

The question was largely knowledge-based and was well answered by the majority of candidates. The strongest candidates covered the full detail of profit types that are distributed under each method.

- Q2** (i) It is typically a type of excess of loss reinsurance though could be quota share. [1]
The cover is usually only available on an annual basis. [1]
... and must be renegotiated each year. [1]
Catastrophe reinsurance will pay out if a catastrophe occurs... [1]
... as defined in the reinsurance contract. [1]
Typically, a catastrophe will be defined as at least a certain number of deaths... [1]
... from a single event... [1]
... within a fixed time from the event. [1]
The insurer pays the first agreed amount of any such loss, the reinsurer pays at least some above this limit. [1]
Reinsurer pays up to a maximum amount that the reinsurer will pay for one event, it may be that only a proportion above the initial amount is paid by the reinsurer. [1]
Any amount above the limit reverts to the insurer. [1]
There is also usually a maximum amount of cover per life. [1]
War, epidemics and nuclear disasters are usually excluded. [1]
Catastrophe reinsurance reduces the potential loss due to non-independence of the risks [1]
Separate catastrophe covers may be available for excluded risks. [1]
Typically catastrophe covers low frequency events that have a high impact. [1]
[Maximum 8]

- (ii) For company A, there is likely no natural link between the lives insured. [1]
Company A is likely to ensure that it has a spread by geographical location. [1]

Company B will have insured groups of lives that are linked... [2]
... typically by employer. [1]

This will be particularly the case where many of the lives covered work in a single location. [2]

Any disaster at that place of work may lead to multiple deaths. [1]

Such as a fire or building collapse. (*any reasonable example*) [1]

It may be common practice for groups of employees to travel together for work purposes... [1]

... leading to the risk of multiple deaths from one travel related incident... [1]

... e.g. plane crash. (*any reasonable example*)

There are also likely to be concentrations of insured lives by broader geographical location. [1]

So any disaster in that location where there are many people could impact those lives. [1]

Such as a fire in a shopping centre or crush in a sports arena. (*any reasonable example*) [1]

As a result, Company B is more exposed to single events leading to multiple deaths of its insured lives than Company A. [2]

As catastrophe insurance would mitigate this risk, Company B is more likely to consider it worthwhile. [1]

[Maximum 8]

[Total 16]

Part (i) of the question was largely knowledge-based but the standard of answers varied significantly with stronger candidates covering all features. The majority of candidates identified that group business could result in lives being connected in part (ii). The strongest candidates gave examples relevant to the type of reinsurance cover in the question.

- Q3** (i) A: deduction (i.e. lower surrenders). [1]
B: addition (i.e. higher surrenders). [1]
This is because on exit, the reserves are released. [2]
So, for A, a surrender will release profit to the company... [2]
... and it is prudent to take credit for less of this than expected. [1]
For B, a surrender will effectively remove an asset from the balance sheet (or equivalently will reduce the expected future profits that will be released to the company, or equivalently will increase liabilities)... [2]
... and it is prudent to take credit for more of this than expected. [1]

The above assumes there is no re-allocation of expenses across policies after exit... [1]

...and depends how any surrender penalty works [1]

[Maximum 6]

- (ii) The persistency assumptions should start from the expected future experience in respect of the contracts. [1]

Ideally the company should have analysed the experience for A and B separately... [2]

... since actual experience might differ between the two. [2]

E.g. because:

- The charges are different. [1]

- In particular, we would expect persistency to be higher for A. [2]

- Or different portfolio sizes or relative sizes [1]

- The contracts could have been sold through different channels... [1]

- ... or may be aimed at a different target market. [1]

The company appears to have taken the approximate average across the 10 years (rounded to 6%) as the best estimate starting point. [1]

And then added a prudential margin of 3% for B and deducted 3% for A [1]

It may be that the margin added to each is not equal as one had guaranteed fixed charges [1]

This is consistent with the appropriate direction of margin, as explained in part (i). [1]

It also corresponds with the lowest experience over the last 10 years for A and the highest for B. [2]

The period over which the investigation has been performed is long. [2]

It could include special factors such as an adverse economic situation in the country. [2]

Or changes in persistency rates due to actions of competitors. [1]

Or changes in the level of charges under contract type B. [1]

Or particularly strong/poor investment performance in the unit-linked funds. [1]

The assumptions do not appear to reflect trends in the data. [1]

In particular, the assumption for B does not appear to be prudent when looking at the most recent data. [2]

The approach does not take account of the potential different mix of business over time (which could distort the analysis). [2]

e.g. by premium size / age (*any relevant example*). [1]

Need to allow for any expected future changes in any of the above factors which would affect persistency rates. [2]

Persistency could be dependent on duration... [2]

... so a more complex analysis and assumption could be appropriate. [1]

It could be that there is not adequate data for a reliable assumption to be based on... [1]

... and this could be why the experience appears volatile over the last 10 years, and why the company has not analysed the data separately. [1]

If this is the case, the company should consider the experience of other similar contracts... [1]

... or industry-wide experience. [1]

It is unlikely that these are suitable assumptions to use, due to the arguments above. [1]

The company may wish to undertake further, more detailed, investigations. [1]

[Maximum 16]

[Total 22]

This question was a differentiator with part (i) generally not well answered. Stronger candidates also focussed on the non-unit reserve position rather than the guaranteed charges in isolation in part (i). Part (ii) was also generally not well answered with only the strongest candidates discussing why A and B should be set separately.

- Q4** (i) The main risk is that the cost of the option is higher than expected... [1]
 .. and so the loading applied to the original premium is insufficient... [1]
 ... and so the company makes a loss. [1]

Experience

The model risk for mortality will be increased... [1]

... as mortality will have to be projected for a longer period. [1]

Similarly, the parameter risk for mortality will increase. [1]

There is much greater anti-selection risk for the new product. [2]

There is a risk that the proportion of policyholders taking up the option is higher than that assumed... [2]

...as would expect those with higher mortality are more likely to take up the option. [2]

Although, if the proportion is significantly higher, then the mortality of the option policy may tend to the ultimate mortality if there are not a lot of selective withdrawals in advance of the option date. [1]

Therefore the additional mortality risk of the higher uptake is offset by a reduction in the additional mortality in the option policy. [1]

There is a risk that the mortality of those taking up the option is higher than that assumed. [2]

There is a risk that selective withdrawals will be higher than expected during the original policy. [2]

As the extra premium will be an additional reason for healthy lives to cancel the policy prior to its end date. [1]

This will increase the proportion of unhealthy lives left to exercise the option. [1]
There is a risk of lapse and re-entry if the new option is not offered to existing business. [1]

New business

The option may not prove attractive... [1]
... and so the additional premiums received may be insufficient to justify the development / cover the development costs. [1]
Competitors may introduce similar options at a cheaper price. [1]
Alternatively, the product may be much more attractive than expected due to the option... [1]
... causing administrative strain... [1]
... or capital strain. [1]

Other

Expense: Additional costs will be incurred (amendments to the administration systems, writing to policyholders as the option comes near)... [1]
... and these may be greater than expected. [1]
Distribution: If sold via insurance intermediaries, it is more likely that they will advise policyholders in poor health to exercise the option. [1]
There may be additional mis-selling risk if policyholders do not realise that the option was available or it was misinterpreted. [1]
There is a risk of poor communication which results in the policyholder not taking up the option as unaware of its existence or reputational risk if the option is not as expected. [1]
Data: There may be additional data risk in relation to obtaining sufficient data with which to price the option. [1]
Operational: There is a risk that incorrect records are kept and the company offers the option to customers who did not select it or a risk that there are errors from staff. [1]
There is increased model risk in relation to valuing the option. [1]
A margin for uncertainty in adding the option would increase capital and could cause solvency issues. [1]
There may be an impact from tax, regulation or the reinsurer. [1]
[Maximum 14]

- (ii) An appropriate pricing methodology should be used to determine the loading. [2]
Including appropriate assumptions. [2]
And an extra margin for uncertainty. [1]

Experience

The increased mortality risk can be mitigated by means of reinsurance. [2]

Risk of higher than expected mortality rates post-exercise could be reduced by increasing the proportion of policyholders that exercise the option. [1]
This can be done by reducing the number of lapses during the original policy... [1]

... and actively encouraging policyholders to take up the option. [1]
 This might be done by mailing policyholders during the original policy... [1]
 ... to emphasis the benefit of life cover... [1]
 ... especially close to the option date... [1]
 ... reminding them of the value of the option. [2]

It will be important to carry out sensitivity analyses... [1]
 ... to see how the profit varies... [1]
 ... in scenarios with varying take up rates... [1]
 ... and additional mortality. [1]
 The mortality risk would be reduced by limiting the term of the original policy... [1]
 ... and restricting the age when the option takes effect... [1]
 ... and restricting/reducing the level of the new benefit. [1]

The margin for mortality could be an explicit margin for mortality... [1]
 ... or a reduction in the rate of improvement. [1]

A minimal level of underwriting could be used. [1]
 e.g. simple questionnaire. [1]

The company could offer a whole life assurance rather than a term assurance. [1]

New business

Ensure that the loadings are competitive relative to those charged by competitors for such options. [1]
 Monitor competitors' offerings. [1]
 Advertise/market the product. [1]
 Impose a maximum new business target. [1]

Other

Thorough testing of the administration changes will be needed... [1]
 ... to ensure that only those that have selected the option at outset are offered it at the end of the original policy. [1]
 The administration system should be developed in a way that enables suitable data to be gathered... [1]
 ... on those that take up option... [1]
 ... and their mortality. [1]
 So it is important that the company can identify policies taken out as a result of the option separately from other new business. [1]
 The sales literature for this product should be clear and not mis-leading. [1]
 Distributors should be trained on the new product. [1]
 Administration staff should be trained on the new product. [1]
 There should be clear process documentation and controls. [1]
 External data/expertise could be used. [1]
 e.g. from reinsurers. [1]
 Expenses should be controlled carefully. [1]
 Outsourcing could be used. [1]

- Sufficient capital buffers should be put in place. [1]
The company could withdraw the option completely. [1]
Lapse and re-entry risk managed with appropriate margin, pricing or training. [1]

[Maximum 18]

[Total 32]

Part (i) was well answered with a number of candidates scoring full marks. The majority of candidates identified the key risks of anti-selection and mortality with stronger candidates considering when the loading could be insufficient and result in a loss. Part (ii) was not as well answered though stronger candidates were able to generate a wide range of points by structuring their answers around the risks identified in part (i).

Q5 (i) Longevity

The longevity assumption will likely change. [1]

Historically all policyholders were required to take an annuity, whereas going forward only those who choose to will purchase an annuity. [1]

The class of lives is therefore likely to change... [1]

... with potentially more financially aware and affluent people taking the annuity... [2]

... as they understand the protection benefits that an annuity provides... [1]

... and may have other funds to support them at retirement... [1]

Alternatively high net worth individual may not need the protection from an annuity but middle affluence do need this. [1]

Whereas the less financially aware or less affluent may be more likely to want or need the lump sum at the time of retirement. [2]

The proportion taking the full accumulated fund may also vary depending on the size of the fund. [1]

For example, if the accumulated pot is small then it is more likely to be taken as cash. [2]

Again, this may impact longevity as those with larger accumulated funds may be more wealthy. [2]

The more affluent or financially sophisticated tend to live longer, so longevity would increase (i.e. lower mortality rates). [1]

There is also likely to be greater anti-selection... [2]

... as those who feel they will live longer than the average are more likely to purchase an annuity. [1]

Or those in very poor health at retirement are unlikely to purchase an annuity. [1]

This would also indicate that the longevity assumption should increase as the business mix changes... [1]
 ...including the future mortality improvement changes [1]

Investment return

The investment return assumption may need to change. [1]
 ... if the longevity changes mean a materially longer expected average duration... [1]
 ... and hence different matching asset yields. [1]
 May adopt an alternative investment strategy due to competitive position. [1]

Expenses

The per policy expense assumption may need to change. [1]
 The proposal will reduce the overall market size ... [2]
 ... so the firm may need to increase the expense assumptions ... [1]
 ... as there will be fewer policies to spread the fixed expenses over. [1]
 It will also need to factor in the development costs of making this change. [1]
 And the inflation rate may need to change... [1]
 ... if the expected liability duration increases (as for investment return). [1]
 Adviser remuneration may increase as advice at retirement is now more complex. [1]

Tax

An important factor will be the tax position at retirement as this is likely to influence the attractiveness of the different options. [1]
 If policyholders have to pay a high tax rate if they take the whole pot at retirement it could incentivise them to take an annuity. [1]
 The insurer should consider this when assessing the take up rate for each option. [1]

Margins

The profit margin (or shareholder required rate of return) may need to be reduced... [1]
 ... because the immediate annuity market is now competitive and has to attract sales. [2]
 Risk margins may need to be increased... [1]
 ... because there is uncertainty about the target market after the change. [1]
 Also, if the market reduces then the ability to diversify will reduce... [1]
 ... and so more prudence may need to be included in the basis. [1]
 [Maximum 20]

- (ii) The aim is to determine the best estimate starting point. [1]
 For example, the insurer could remove the policies with small fund values from the experience analysis. (*or similar example*). [2]
 Perform market research... [2]
 ... to help determine the likely size of the market... [1]
 and the likely mix of the market. [1]
 Speak to external experts such as reinsurers... [2]

... or consultants... [1]
 ... or industry bodies. [1]
 Attempt to obtain information on the intentions of competitors. [1]
 Ask distributors for their view. [1]
 If other countries have experience of a similar change in regime, speak to peers abroad. [1]
 Decide on a market strategy... [1]
 ... i.e. whether to target a particular subsection of the population with the pricing to effectively encourage others to take the full lump sum. [1]
 Actively monitor experience going forward... [1]
 ... particularly in the short term before a long-term stable position is reached. [1]
 Overall a margin for prudence may be included but need to consider keeping rates competitive. [1]
 Build or use a model for experience analysis or to help determine the margin. [1]
 [Maximum 8]

- (iii) If policyholders choose to take the full accumulated lump sum at retirement without purchasing an annuity... [1]
 ... then there is a risk that they do not have sufficient funds to last throughout their retirement. [2]

This may be due to the policyholder spending rather than investing the lump sum... [1]
 ... for example using it to go on a round the world cruise (*any example*). [1]
 Or due to the policyholder investing it in a product which is not designed to provide a regular income throughout retirement. [1]
 For example, investing in property and not being able to access the cash when needed due to property not being a liquid asset (*any valid example*). [1]
 Or not investing in an asset or policy which provides inflation protection [2]

The policyholder may budget but then live longer than they expected and run out of money in the future. [2]
 They may not provide a benefit for dependants which an annuity generally would, so there is a risk that they will not be provided for on the death of the policyholder. [1]

As the policyholder will now be able to “shop around” for an annuity in the open market... [1]
 ... there is a risk that they may be given inappropriate advice. [1]
 Or they may not make the best choice themselves if they decide not to take advice. [1]
 e.g. may increase the risk of the annuity being defaulted by the insurer... [1]
 ... if the annuity provider chosen was offering very attractive rates but was not financially secure [1]

There is a risk that the policyholder does not fully understand the tax implications of taking the full accumulated lump sum at retirement and ends up being worse off financially. [1]

There is a risk that annuity rates become more expensive due to fewer lives purchasing an annuity or from improving mortality experience. [1]

[Maximum 8]

[Total 36]

Parts (i) and (iii) were reasonably well answered with the majority of candidates securing marks for identifying the impact on longevity in part (i) and stronger candidates fully considering the impact that competition issues could have on profit margin and capital position. Part (ii) was not as well answered as many candidates repeated significant points from part (i) around how assumptions would change. Again stronger candidates considered wider points, such as looking externally to gain additional data and information.

- Q6**
- (i) Premium / initial pension fund size, [1]
 - Customer age / range of ages / business mix, [1]
 - Business volumes (as influences expenses) [1]
 - Mortality rates, [1]
 - Initial expenses, [1]
 - Commission (if applicable and if variable), [1]
 - Renewal expenses, [1]
 - Withdrawal payment processing expenses/claim expenses, [1]
 - Annual review cost, [1]
 - Investment expenses, [1]
 - Full withdrawal/surrender rates, [1]
 - Average annual income withdrawal rate, [1]
 - Investment/fund growth rate, [1]
 - Proportion of funds that are invested in the 'income solution' fund, [1]
 - Proportion of customers that select the annual review option, [1]
 - Split of income frequencies (if this affects expenses), [1]
 - Expense inflation, [1]
 - Risk discount rate, [1]
 - Tax rates, if relevant, [1]
 - Reserving valuation basis/margins (for calculation of non-unit reserves). [1]
 - [Maximum 12]
 - (ii) There are no guarantees or options on the product. [1]
 - So the possible outcomes form a symmetric distribution. [1]
 - Information is only required on the expectation. [1]
 - Thus there is no need to obtain information on the probability distribution of outcomes. [1]
 - The deterministic model will also be cheaper to build... [1]

- ... And take less time than building a stochastic model... [1]
- ... And require less expertise. [1]
- A deterministic model is easier to explain outcomes to stakeholders. [1]
- It is easier to interpret the results from a deterministic model [1]
- It is easier to model scenarios with a deterministic model [1]

[Maximum 4]

- (iii) Sensitivity tests should be performed on key assumptions. [2]
 - To test the effect of mis-estimation of parameters. [1]
 - And mis-estimation of model points chosen. [1]
 - This may help to set the risk margin in the risk discount rate. [2]
 - E.g. sensitivity on the income withdrawal rate. [1]
 - And the fund growth rate... [2]
 - „, since charges are dependent on the fund size. [1]
 - And the average premium size... [2]
 - ...or business volumes... [1]
 - ...or proportion taking income fund... [1]
 - ... since it is likely that some expenses will be fixed. [1]
 - Sensitivity to the take up rate of features should be done. [1]
 - The company may also perform scenario testing... [1]
 - ... as there are some assumptions that are likely to move dynamically... [2]
 - ...e.g. fund growth might influence the level of income taken. [1]

[Maximum 8]

- (iv) The company could redesign the product. [1]
 - It could introduce other charges... [1]
 - ...e.g. bid/offer spread, allocation rate etc. [1]
 - It could introduce surrender/withdrawal penalties. [1]

- It could increase the basic annual management charge. [1]
- It could increase one or both of the additional charges. [1]
- This will make the pricing look more profitable... [1]
- ... actual profits may be increased by reducing charges and increasing sales. [1]

The company could reduce / remove any unnecessary margins in the pricing basis. [1]

- It could reduce the expenses that will be incurred. [2]
 - E.g. reduce any commission payable. [1]
 - Or if a more efficient way to process withdrawals is found. [1]
 - Or a more efficient way to set up or do annual maintenance on policies. [1]
 - Or it might be able to outsource these activities for a lower cost. [1]

It could restrict investment choice. [2]

- It could impose a minimum initial pension fund (or premium) size. [2]
- Or could limit the amount allowed to withdrawal or number of withdrawals [1]

It could impose a maximum age. [1]

It could use a different distribution channel. [1]

And/or target a more affluent market (to increase the average pension fund size). [1]

And/or target a different market which would have better withdrawal experience (i.e. leave funds invested for longer). [1]

If they are profitable on a standalone basis... [1]

... the company could promote the two optional features. [1]

The company may be able to reduce the charge for these optional features and increase profit by gaining higher take-up. [2]

The company could provide more education on how long the customer needs the income to last (to reduce income withdrawal rates). [1]

The company could actively promote the product in order to sell higher volumes. [1]

[Note: since the command verb is "Suggest", the justifications in brackets are not needed to give the mark; provided for information.]

[Maximum 16]

[Total 40]

Parts (i) and (ii) were well answered with the majority of candidates able to generate sufficient assumptions the company would use and commenting on no guarantees or options. In part (iii) stronger candidates identified relevant specific runs to perform in addition to the more generic benefits of additional runs. Instead of focussing on the detail of additional checks in part (iv), stronger candidates used the specifics of the question to generate points.

Q7 (i) Taking into account policyholders' reasonable expectations. [1]

Whether this is met depends on what has been communicated to the scheme members. [1]

The method may appear unreasonable at early durations. [1]

Not exceeding earned asset shares, in aggregate, over a reasonable time period. [1]

Using a prospective, rather than retrospective, method means that there is no guarantee that this principle will be met. [2]

Treating both transferring and continuing policyholders equitably. [1]

Using best estimate assumptions in a prospective valuation means that the company is expecting to retain the same profit as if the contract had not been transferred. [2]

This principle is therefore met. [1]

At early durations, not appearing too low compared with premium paid.	[1]
Because the method allows the company to retain the full profit over the contract's lifetime...	[1]
... transfer values may appear very low at early durations.	[1]
Hence this principle may not be met.	[2]
It is not clear whether this would have been made clear in projections given when the buy-out took place.	[1]
Similarly, early transfer values will appear low if there has been a significant adverse change in pricing assumptions.	[1]
Particularly an increase in interest rates / bond yields.	[1]
 Taking account of competitor transfer values.	[1]
The extent to which this principle is met will depend on the approaches taken by other companies.	[1]
However, the buy-out situation is not clearly one in which competition is important.	[2]
If competitors use a retrospective method, then early transfer values would likely be more generous.	[1]
The prospective method is more likely than the retrospective method to produce comparable transfer values to those offered by competitors...	[1]
... and those offered at auctions, if applicable.	[1]
But it also depends on the basis being used.	[1]
 At later durations, being consistent with projected maturity values.	[1]
This principle is not directly relevant to deferred annuities, as there is no maturity benefit payable.	[1]
Equivalently, because a prospective method is used, the transfer value will be consistent with the present value of expected pension payments at dates close to the retirement date.	[2]
 Not being subject to significant discontinuities by duration.	[1]
This principle is met.	[1]
Not being subject to frequent change, unless dictated by financial conditions.	[1]
This principle is met...	[1]
... provided the non-financial elements of the best estimate basis do not change too frequently/materially.	[1]
 Not being excessively complicated to calculate.	[1]
It should be possible to meet this principle...	[1]
... since the company already has in place a prospective valuation system which can be used.	[1]
And it does not have to capture historic information.	[1]
 Being capable of being documented clearly.	[1]
It should be possible to meet this principle.	[1]
	[Maximum 24]

- (ii) The actuarial model will need to be run on the pricing basis as well as the valuation basis. [2]
 This may require amendments to the current valuation model... [2]
 ... e.g. if pricing is done using a yield curve and the valuation is done using a single rate of interest. [1]
 It may be difficult to produce transfer values in the required timeframes. [2]
 It needs to consider what an appropriate turnaround time standard for transfer value requests is. [1]
 It needs to consider whether a full run of the actuarial valuation model is required for each request... [1]
 ... or whether alternative approaches could be used. [1]
 Such as using sensitivities and market indices. [1]
 It needs to consider whether economic assumptions/market data are available at mid-points in the month. [1]
 And what happens if there are material market movements. [1]
 The company may need to create trigger points above/below which sensitivities become invalid. [1]
 The company needs to decide which department will provide the transfer values. [1]
 It may not be appropriate for the actuarial valuation team to do so, as more likely to be dealt with in a customer service area. [1]
 So they would require training on the process. [1]
 There may be a high number of requests arriving at the same time. [1]
 The company may need to take on extra resources. [1]
 It will need to design and produce transfer value documentation/statements. [1]
 The implementation and development costs will need to be considered. [1]
 As will the cost of processing each transfer value. [1]
 If there is poor customer service this could generate additional demand. [1]
 [Maximum 10]
- (iii) The reserve for each member would be calculated considering all benefits for that member, including the potential spouse's pension. [1]
 Therefore, it may not be easy to identify the value of the spouse pension separately from the other benefits for that member. [2]
 If the model has separate inputs for the member's pension amount and the spouse's pension amount, then the former could be set to zero. [1]
 However, it is more likely that it will model the latter as 50% of the former. [1]
 If the model allows input of a 0% spouse loading... [1]
 ... then an option could be to perform runs of the actuarial valuation model with and without a spouse's pension... [2]
 ... and the difference between the two would be the value of the spouse pension. [1]
 Alternatively, the "without a spouse's pension" calculate could be run by inputting the spouse as having an extremely high age. [1]
 However, this approach may not be feasible to perform on a frequent basis. [1]
 due to the additional work required. [1]
 and the increased potential for errors. [1]
 A practical solution may be to perform these additional runs just a few times a year. [1]

in order to determine a scaling factor to the member's overall reserve which could be applied in the interim periods.	[1]
Alternative, the company could calculate factors to apply to an individual reserve which vary by member's and spouse's age.	[1]
These factors would remain fixed for a period.	[1]
It may be that the record does not indicate whether or not the member is currently married.	[1]
Marital status can change between now and death.	[1]
Therefore an assumption would be needed for the probability of being married at the time of death.	[1]
Possibly expressed as a simple proportion of members.	[1]
Even if the record does indicate marital status, there may not be any specific details of the existing spouse held.	[1]
So an assumption may be needed for the spouse's age, mortality or gender	[2]
This may be based on an age difference e.g. member's age – 2	[1]
	[Maximum 10]
	[Total 44]

Part (i) was mainly knowledge based but only stronger candidates related the principles to the specific scenario. Parts (ii) and (iii) were generally not well answered with many candidates repeating points between the two parts though many identified that assumptions would be needed on the spouse due to lack of data, In part (ii) stronger candidates reflected the question by focussing on the practical production issues.

END OF EXAMINERS' REPORT