INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

September 2016

Subject SA4 – Pensions and other Benefits Specialist Applications

Introduction

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

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

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

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

Luke Hatter
Chair of the Board of Examiners
December 2016

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

1. The aim of the Pensions and other Benefits Specialist Applications subject is to instil in successful candidates the ability to apply knowledge of the United Kingdom pensions and employee benefit environment and the principles of actuarial practice to providers of pensions and employee benefits in the United Kingdom.

2. This subject examines the ability of candidates to apply actuarial practice and concepts, together with specific knowledge of the UK pensions and employee benefit environment to potentially complex problems, integrating their analysis into a coherent whole, and evaluating and interpreting results to draw explicit conclusions.

3. The Examiners therefore look for candidates to demonstrate their understanding of the syllabus but in particular they need to demonstrate ability in applying their knowledge and core actuarial skills to the specific situations that the Examiners have raised, having read the question carefully. Consistently, many of the unsuccessful candidates provide answers that are not sufficiently specific to the subject matter of the question, reproduce core reading that does not directly relate to the question context, or focus on one specific point without covering a sufficient range of points to answer the question. This does not enable the candidates to achieve the required marks. The Examiners encourage future candidates to remind themselves of what they learned in the Core Actuarial subjects, and to use past paper questions to practice applying these skills to the specific scenarios tested.

4. Good candidates demonstrate that they have structured their solutions well – this is a big advantage in making points clearly and without repetition. There is a significant incidence of points being repeated in slightly different ways, restricting the scope for candidates to score marks. Good structure enables candidates to use the latter parts of questions to generate ideas for answers to the early parts (or use their solutions to earlier parts of questions to create a structure for latter parts). Time management is important so that candidates give answers to all questions that are roughly proportionate to the number of marks available. The questions are set so that it should take approximately twice as long to answer a 10 mark question as a 5 mark one. Answers should therefore be similarly proportionate.

5. In addition, candidates should carefully consider the instruction – for example an instruction to list points should be answered with a list without attaching discussion. Similarly, a question asking for a discussion cannot be answered with a list of undeveloped points.

6. Finally, it is very helpful to the Examiners if candidates clearly identify points made; if they are set out clearly, well-spaced and easily legible. Whilst there is no loss of marks for not doing so, doing so does make it easier to identify scoring opportunities.

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

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

1. The overall standard of scripts was similar to the previous session, with candidates over recent years maintaining a very consistent level of performance.

2. The step up from the earlier subjects to a smaller number of more involved questions is relatively difficult for some candidates who find the application aspects of the course harder to score well on. This is an area that SA candidates consistently need to work harder on in preparation. By taking a methodical approach to answers, step by step, however, there are opportunities to score well. It is important that candidates make sure they provide a full answer to all questions. Breaking the question down into smaller parts helps to make sure that a suitable breadth of answer is supplied. It is critical that candidates check that their answers specifically refer to the details of the question, using all of the information in the question pre-ambles. It is not the intention of the examiners to include information in the questions that is not relevant to the answers.

3. Candidates should take note of the command verbs used to guide the depth given in their answers (a list of what is expected for each verb is available on the IFoA website). Candidates should also note the number of marks available for each question as a guide of how many points they need to cover.

4. Taking care in these points of technique will help students score better.

5. More detailed feedback is provided on each question below.

C. Pass Mark

The Pass Mark for this exam was 58.

Solutions

Q1 (i)

- Tax concessions are granted to registered schemes in respect of retirement savings. [½]
- E.g. occupational pension schemes, personal pension plans, stakeholder plans, retirement annuity contracts and deferred annuity contracts. [½]
- The "Exempt, Exempt, Taxed" system provides an incentive to save for retirement by providing a more favourable tax environment than applies to ordinary savings from earnings [½]
- contributions by employer usually allowed as business expense and so are deducted from profits before the calculation of corporation tax [½]
- contributions by an employer not classed as a taxable benefit in kind for the employee [½]
- contributions by employer not subject to National Insurance contribution deduction [½]

- contributions by employee deducted from personal taxable income before calculation of income tax [½]
- individuals can claim full tax relief on contributions made on their behalf by third parties [½]
- restrictions apply for high earners [½]
- investment income not subject to tax, though corporation tax paid in relation to share dividends cannot be reclaimed [½]
- capital growth is not subject to tax [½]
- lump sum death benefit receipts (within HMRC's limits) not subject to tax (neither income nor inheritance tax) [½]
- provided they are paid at the discretion of the trustees [½]
- from 6 April 2010, refunds of contributions up to £20,000 to early leavers are taxed at [½]
- 20%, which is currently the same as the basic rate of tax, although the rates do not have to be the same [½]
- Any amount in excess of this figure is taxed at 50% [½]
- The UK has double taxation agreements in place with a number of countries which reduces the tax paid on certain investment income. [½]
- Pension often taxed at lower marginal rate as income has fallen [½]
- A Lifetime ISA is being introduced … [½]
- … which will receive a government bonus of 25% of the savings paid before age 50 if it remains in place until age 60 … [½]
- … and after age 60 the fund can be withdrawn tax free. [½]

[Maximum 6]

(ii) **Annual Allowance (AA)**

- To qualify for tax relief, contributions must not exceed the member's "Annual Earnings" in the tax year (or £3,600 if greater) [½]
- And the member must be aged under 75 [½]
- In order to control flow of contributions to, or accrual in a registered pension scheme, there is an upper limit, known as the Annual Allowance, on the amount of contributions (including employer) and benefits that may be built up in any one tax year that are eligible for tax relief. [½]
- An additional, penal, Annual Allowance tax charge is payable if the member exceeds the AA. [½]
- The AA for the 2015/16 tax year is £40,000. [½]
- Unused AA from the three previous tax years may be carried forward [½]
- Tax relief on pension savings for high earners was restricted under legislation known as "anti-forestalling" from 22 April 2009. [½]
- The AA further reduced for individuals with earnings over £150,000 per annum from April 2016 [½]
- For tax year in which the individual retires on ill-health grounds or dies, AA will not apply. [½]
- Value placed on contributions into a DC scheme will be the monetary amount of contributions paid. [½]
- Value placed on benefits accrued in a DB scheme will be 16 times the difference between the amount of accrued pension entitlement at the end

and beginning of the input period (increased by CPI) plus the amount of any separate lump sum accrued. [½]

- Contributions to non-registered arrangements will not count towards the AA. [½]

Lifetime Allowance (LTA)

- The total value of a member's benefits from registered schemes is assessed against a Lifetime Allowance (LTA). [½]
- The LTA is currently £1,250,000. [½]
- In March 2015, Chancellor announced that the LTA would reduce from £1.25 million to £1 million from April 2016. [½]
- Going forward, the LTA will be linked to CPI from April 2018. [½]
- If a member's pension savings exceed the Lifetime Allowance, a penal Lifetime Allowance tax charge is payable [½]
- The value of the member's benefits will be assessed against the LTA when they come into payment, either on death or retirement. [½]
- The value of dependants' pensions will not be tested against the LTA. [½]
- DB Pensions will be generally valued as 20 times the pension payable after commutation with tax-free cash sums taken at face value. [½]
- DC funds are taken at face value [½]
- Transitional protection regimes are in place for individuals whose savings were in excess of the Lifetime Allowance when it was introduced and subsequently reduced [½]

Other restrictions

- Lifetime ISA limits are £4,000 p.a. [½]
- There is a restriction on the amount of cash that can be taken tax-free at retirement. [½]
- For members of DC schemes this is up to 25% of the member's accumulated fund. [½]
- For members of DB schemes this is up to 25% of the value of the benefits within the LTA, subject to the rules of the member's scheme. [½]

[Maximum 6]

(iii)

- Currently retirement savings are taxed on Exempt Exempt Taxed (EET) basis whilst non-retirement savings within a wrapper such as an Individual Savings Account are taxed on Taxed Exempt Exempt (TEE) [1]

For:

- Easier to understand [½]
- Brings tax income forward for the Government [½]
- and possibly increases it if pensioners are in lower tax bracket than workers [½]
- Arguably fairer – under EET the majority of the tax benefit goes to higher and additional rate taxpayers who are in a lower tax band when they retire [½]
- Overall a simpler approach which could lead to lower communication and administration costs for the State and providers [½]

- The State could benefit from the anomalies where benefits are currently exempt from tax e.g. lump sum on retirement [½]
- It may encourage more people to save especially as there may be some mis-trust in the current pensions environment e.g. the price of annuities[½]
- There will be more flexibility for individuals in terms of saving and benefits taken [½]
- It may encourage innovation within saving vehicles [½]

Against:

- Higher rate tax payers could lose out if pension lower than higher rate limit [½]
- Will rules change again so end up with double taxation? [½]
- General feeling is that there will be less incentive to save [½]
- Leading to poorer outcomes [½]
- Will actually make system more complex as people will have pensions under different tax regimes [½]
- If all saving were "non-retirement" then there would be no restriction on when they could be spent and they could be used up before retirement [½]
- Progressive income tax rates discourage people from drawing down their whole pot too quickly under the current EET system. This would be lost. [½]
- Bringing forward income tax means that there will be less collected in the future. [½]
- The costs and complexity of transition and implementation. [½]
- The redistributive nature of the current system is lost i.e. where higher earners pay more tax as they are more likely to fall into lower tax band on retirement. [½]
- The impact on benefits provided directly by the State would need to be considered. [½]
- The emphasis on retirement saving may be diluted which may lead to greater reliance on the State in retirement. [½]

[Maximum 6]

[Total 18]

Part (i)	Candidates who structured their answers well (e.g. splitting into contributions/investments/benefits) tended to score well. Those who did not consider a broad enough range of points did less well. Candidates who used their real-life knowledge of the lifetime ISA and the end of contracting out in relation to reduced NI contributions were given credit.
Part (ii)	Mainly answered well but some candidates did not know the Core Reading well enough to provide the detail behind AA and LTA.
Part (iii)	Most candidates got the more obvious points but not many thought through all angles and scored well. This was a good

differentiating question as the best candidates were able to think past the obvious points and consider different points of view.

Q2 (i)

- Actual costs paid do not depend on funding method, which just effects the pace of funding [1]

Cost of accrual will depend on:

- Benefits provided [½]
- including accrual rate [½]
- Pension increases [½]
- Salary link/revaluation [½]
- Dependants' benefits [½]

- Assumptions used in funding valuation [½]
- Level of prudence [½]
- Including discount rates which will be dependent on investments [½]
- Cost to the employer will also depend on members' contribution rate [½]
- Costs of running the scheme will depend on costs of administration, [½]
- advisers [½]
- investments [½]
- and levies [½]
- in addition, there is the time cost of the employer and their involvement in the scheme [½]
- insurance premiums [½]
- actual experience in scheme e.g. demographic, financial [½]

Reduce costs:

- Close scheme to accrual [½]
- Cheaper benefits [½]
- e.g. lower accrual rate [½]
- lower pension increases (subject to statutory minimum) [½]
- career average (or other risk sharing option) [½]
- increase member contributions [½]
- reduce prudence in funding approach (if previously mentioned pace of funding) [½]
- invest in assets with higher return [½]
- increase normal retirement age [½]
- Cheaper advisers [½]
- Negotiate contracts [½]
- Possibly look for package which included admin, actuarial etc. all in one [½]
- Cheaper investments – off the shelf index tracker [½]
- Cheaper insurance [½]
- More penal option terms [½]
- Manage PPF levy [½]

Stabilise costs
- Reduce risk within scheme e.g. through risk sharing [½]
- Change funding method [½]
- e.g. move to Attained Age [½]
- although scheme is open to new members so should be stable anyway [½]
- adopt a less risky investment strategy [½]
- Insure some benefits [½]
- Stop any discretionary benefits [½]
- Cap salaries for active members [½]
- Longer fee agreements [½]
- Cost neutral options [½]
- Redesign scheme – career average, DC [½]

[Maximum 12]

(ii) Funding:
- Pay more employee/er contributions into the scheme [½]
- Cease accrual to redirect contributions to accrued benefits [½]
- Or reduce benefits in some way (as in (i) above) subject to legislative constraints [½]
- Fund scheme on prudent basis [½]
- So that risk of assumptions not being borne out is less [½]
- Regular valuations [½]
- To keep check on funding level [½]
- Offer trustees security/contingent assets [½]

Investments:
- investigate matching the assets to the liabilities [½]
- with advice from investment adviser [½]
- so gilts/bonds [½]
- either fixed or index-linked depending on nature of liabilities [½]
- possibly using cashflow models and ALM [½]
- could use derivatives although scheme is small so unlikely to be available [½]
- although off the shelf LDI products now possible [½]
- matched position likely to lead to lower discount rate and therefore increased deficit [½]
- but future funding position more stable [½]

Liability management:
- To remove or mitigate risk in respect of some liabilities … [½]
- … so that the possibility of deficit in respect of poor experience here is also removed /reduced insure some liabilities e.g. using annuities [½]
- or buy-in/buyout [½]
- which is likely to be expensive [½]
- or liability reduction exercise [½]
- e.g. pension increase exchange [½]
- or CETV exercise [½]

Other:

- Make sure any options are cost neutral [½]
- e.g. early/late retirement [½]
- so there is no loss to scheme on these events [½]
- Check scheme documentation for any restriction to above actions [½]
- And consult with employer and members [½]
- Consent required for options [½]

[Maximum 10]

(iii) **The key documents are**:

- Statement of Funding Principles [½]
- which included the Scheme's statutory funding objective (SFO) [½]
- Any additional funding objectives [½]
- The circumstances in which anyone other than the employer might contribute [½]
- The circumstances in which payments may be made to the employer [½]
- The extent to which discretionary powers have been taken into account [½]
- The frequency of valuations [½]
- When additional valuations might be carried out [½]
- Policy towards cash equivalent transfers if a deficit exists [½]
- How, and over what period, any deficit will be met [½]
- Description of actuarial assumptions to determine TPs and for use in Recovery Plan [½]

- Schedule of Contributions [½]
- Specifies both the amount and timing of contributions [½]
- How expenses, LSDB insurance and PPF levies are met [½]
- Must be certified by the scheme actuary [½]
- As consistent with legislation and the SFP [½]
- Signed by the trustees and usually also the employer [½]
- And, if a deficit exists, must be sent to Regulator within 10 working days of certification **[NOTE 5 days also acceptable]** [½]

- Recovery Plan [½]
- Applies if a deficit exists relative to technical provisions [½]
- Steps to be taken to achieve statutory funding objective [½]
- Date by which deficit is expected to be eliminated [½]
- Assumptions underlying calculation of shortfall [½]
- Signed by the trustees and usually also the employer [½]

- Valuation Report [½]
- In addition to details of the technical provisions the valuation report must include the Scheme Actuary's estimate of the solvency of the scheme … [½]
- … and a "neutral estimate" of the scheme's liabilities, i.e. an estimate with all margins for prudence removed. [½]
- Full actuarial valuations are required at least every three years and the formal reports must be issued within 15 months of the effective date. [½]

- Trustees can opt to have annual valuations performed and if they do not take up this option, they are generally required to obtain an annual actuarial report giving an approximate update of the funding of the scheme. [½]
- This report must be completed within 12 months of the effective date. The trustees must make all reports available to the employer within seven days of receipt. [½]
- A summary funding statement must also be issued within three months of the report deadline. [½]

Key assumptions:

- SFO legislation requires the assumptions as a whole to be set prudently [½]
- … and market-related. [½]
- Funding approach is the responsibility of the trustees but they are required to at least consult with the employer … [½]
- … and agree with the employer if a third party (usually the employer) has the right to set the contributions under the Trust Deed and Rules [½]
- Gaps between the financial assumptions are more important than the absolute values when determining present values [½]

- Discount rate – assumed annual rate set with regard to the return expected to be achieved from the scheme assets. [½]
- or based on the benchmark assets [½]
- is often different for pre- and post-retirement [½]
- applied to the cashflows expected to be generated in relation to the scheme [½]
- and converts those cashflows in to a capital value. [½]
- It is a critical assumption for all valuations as it affects the value of all liabilities. [½]

- Mortality in retirement – the annual rate at which members and their dependants die once in retirement. [½]
- It is used to determine for how long the pension is anticipated to be paid [½]
- generally constructed with regard to current rates of mortality, and how these are expected to change in the future. [½]
- Scheme generally use standard base tables [½]
- Larger scheme may adjust these based on scheme experience [½]
- a critical assumption for all valuations as it affects the value of all current and future pensioners. [½]

- Inflation – the rate at which pensions increase on an annual basis once in payment. [½]
- and the rate at which pensions are likely to revalue in deferment [½]
- will be a key assumption as all benefits linked to it. [½]
- Consider the relationship between current yields on fixed and index-linked bonds, and RPI and CPI [½]

- Consider any policy statements and objectives of the Bank of England and the government [½]
- Salary increases also generally linked to inflation [½]

- Take up of options and option terms e.g. cash commutation [½]

Other assumptions of secondary importance:
- Proportion married [½]
- Age difference between spouses [½]
- Rate of early retirement [½]
- Rate of withdrawal before retirement age [½]

[Maximum 1 for examples of less important assumptions]

Sponsor covenant:
- However, experience could be worse than prudent assumptions, in which case the Trustees will need to ask the sponsoring employer for additional funding [½]
- The sponsor covenant is the sponsor's ability and legal obligation (or ability and willingness) to provide such additional funding [½]
- The degree of prudence in the funding basis is a function of the strength of the sponsor covenant [½]
- The weaker the covenant, the more prudent the assumptions should be [½]
- therefore this is an important consideration for trustees [½]
- strength of sponsor covenant should be considered when setting a recovery plan for scheme in deficit [½]
- A strong covenant might result in a longer recovery plan being agreed due to the lower risk perceived or [½]
- a shorter recovery plan on the basis that the employer is able to afford it [½]
- a weak covenant could also lead to a shorter recovery plan to reflect trustees' desire to eliminate deficit as quickly as possible, [½]
- but trustees must consider what is affordable for the employer [½]
- so longer recovery plan may be in the best interests of the scheme if the employer is able to remain solvent and sustain the level of contributions [½]
- The Pensions Regulator considers that trustees should set a recovery plan to eliminate deficit as quickly as the employer can reasonably afford [½]

- The covenant is likely to also impact on how much risk is taken in the investment strategy [½]

[Maximum 22]

[Total 44]

Part (i)	Some candidates did not distinguish between reducing costs and making costs stable and went into detail on how accrual rates were calculated rather than what affected the cost of benefits. The best candidates were able to differentiate between reducing and stabilising costs, and thought widely about all areas of the scheme.
Part (ii)	Answered fairly well but generally not a broad enough range of points made for a 10 mark question.
Part (iii)	Generally answered well, as most candidates followed the structure set out in the question; by covering each of those areas in turn they picked up a lot of the points. Some candidates did not provide detail behind the documents of SFO valuation – candidates should ensure they are familiar with what is expected for each command verb to help guide their answers.

Q3 (i)

- 1. Effective decision making [½]
- Trustees should ensure that decisions are taken by persons or organisations with the skills, knowledge, advice and resources necessary to take them effectively and monitor their implementation [½]
- Trustees should have sufficient expertise to be able to evaluate and challenge the advice they receive, and manage conflicts of interest. [½]

- 2. Clear objectives [½]
- Trustees should set out an overall investment objective for the fund that takes account of the scheme's liabilities, the strength of the sponsor covenant and the attitude to risk of both the trustees and the sponsor [½]
- Trustees should clearly communicate these to advisers and investment managers [½]

- 3. Risk and liabilities [½]
- In setting and reviewing their investment strategy, trustees should take account of the form and structure of liabilities. [½]
- These include the strength of the sponsor covenant, the risk of sponsor default and longevity risk. [½]

- 4. Performance assessment [½]
- Trustees should arrange for the formal measurement of the performance of the investments, investment managers and advisers. [½]

- Trustees should also periodically make a formal policy assessment of their own effectiveness as a decision-making body and report on this to scheme members. [½]

- 5. Responsible ownership [½]
- Trustees should adopt, or ensure their investment managers adopt, the Institutional Shareholders' Committee Statement of Principles on the responsibilities of shareholders and agents. [½]
- A statement of the scheme's policy on responsible ownership should be included in the Statement of Investment Principles. [½]
- Trustees should report periodically to members on the discharge of such responsibilities. [½]

- 6. Transparency and reporting [½]
- Trustees should act in a transparent manner, communicating with stakeholders on issues relating to their management of investment, its governance and risks, including performance against stated objectives. [½]
- Trustees should provide regular communication to members in the form they consider most appropriate. [½]

[Maximum 6]

(ii)

- The assumptions used to assess Technical Provisions will have to relate to the SFP [½]
- So will need to be prudent, consistent with those used in setting the SFP [½]
- Unlike those used for assessing cashflows which should be realistic [½]
- To understand the risks of the timings of investment cashflows not meeting benefit cashflows e.g. reinvestment risk, liquidity risk. [½]
- And not include any margins for prudence [½]
- Cashflows usually undiscounted so discount rate not needed [½]
- E.g. if SFP is a self-sufficiency basis or accounting basis [½]
- The assumptions used for the Technical Provisions will be long term in nature [½]
- some options may be ignored if either cost neutral or beneficial to scheme's finances [½]
- E.g. commutation at retirement, Early retirement, Transfers out [½]
- Cashflow assumptions could be much more short term [½]
- and allow, for example, for short term inflation expectations [½]
- Or company plans for restructuring workforce [½]
- Cashflows could be net of inflation, leaving investment adviser to adjust for this [½]

[Maximum 6]

(iii) Scheme design

- Need to consider the design of the guarantee within the general scheme design [½]
- What is the likely cost of the guarantee? [½]
- And how will it be measured? [½]
- Is guarantee applicable a year at a time or over the whole period of membership [½]
- Will it apply to each individual fund available to invest in [½]
- Or to each member's fund as a whole [½]
- Does guarantee apply to all contributions [½]
- will guarantee apply after retirement [½]
- i.e. once members are drawing pension [½]
- are there any other guarantees that are cheaper [½]
- or more appreciated [½]
- what are other schemes doing [½]
- Also legislative requirements/costs [½]
- Such as valuations [½]
- And levies if applicable [½]

Risks involved

- The cost of guarantee is greater than expected … [½]
- … which is reflect in higher contributions than expected [½]
- Or additional funds required at inopportune times (liquidity / marketability risk) [½]
- Particularly as there is a concentration of risk i.e. that the guarantee bites for lots of members in a given period as a result of a market crash [½]
- Will members appreciate it [½]
- i.e. is it value for money or could the extra money be used to increase contributions [½]
- or provide other guarantees [½]
- will members select against it [½]
- by choosing risky investment strategies [½]
- The trustees may wish to limit the investment options available to mitigate this risk … [½]
- … and/or offer a default fund [½]
- The guarantee is likely to be more expensive the more frequently it applies i.e. yearly, to each fund and on each event. [½]

[Maximum 6]

(iv) The main sources of cashflow are:

- Ongoing Contributions from employer and members into members' funds [½]
- Employer contributions into underpin reserve [½]
- Payments out of reserve to members (if funded) [½]
- Refunds to employer from reserve if funded [½]
- Switches between different funds [½]
- Transfers in/out [½]

- Pension payments to members on retirement if payment from fund [½]
- Refunds to members on death [½]
- Pension Commencement lump sums on retirement [½]
- Professional and Administration fees [½]
- Investment expenses [½]
- Insurance premiums [½]
- Regulatory levies [½]
- Payments to insurance company to purchase annuities (if bought out) [½]
- Investment income and returns on funds [½]
- Buying and selling investment assets [½]

[Maximum 5]

(v)

- Deciding on a model to use [½]
- And the assumptions to use within that model [½]
- Especially as new scheme so no previous experience [½]

- What is the model going to be used for? [½]
- Is it for reserving, accounting, cashflow modelling or some other use. [½]
- Depending on reason assumptions or objectives could be different [½]

- How will the objectives be set? [½]
- e.g. 90% chance of reserve being sufficient to pay underpins over next 5 years [½]
- How many simulations to run [½]
- Will model just need to provide value of reserve to be held [½]
- Or show probabilities of extra funds being required over set periods [½]

- Will need expected returns and standard deviations for all asset classes [½]
- This could be a lot depending on choice in scheme [½]
- Along with correlation between classes [½]

- Will also need to have assumption regarding members' choices of funds [½]
- Are members more likely to go for risky assets if there is 0% underpin [½]
- Will this attitude change in times of economic upheaval [½]
- So will members move based on current, past or perceived future economic scenarios [½]
- Will this affect lifestyling choices [½]

- Time; the need to develop and test a suitable model [½]
- Cost; the exercise could be costly given the complexity [½]
- Communication; the danger of miscommunication between the company and the actuary with regard to what is required … [½]
- … and in interpreting the results [½]
- Ensuring those involved have sufficient experience and expertise … [½]
- … in particular regarding how to model more unlikely events. [½]

- Consider TAS-M [½]

[Maximum 6]

(vi)

- Results are only as good as the model and the assumptions [½]
- And even correct results might not be helpful [½]
- E.g. if results are unstable [½]
- Some factors will be very difficult to predict [½]
- Such as member's investment choices [½]
- And movements in and out of scheme [½]
- Market volatility will be an issue [½]
- Especially how it affects behaviours [½]
- Model should improve over time as more information becomes available [½]

[Maximum 3]

(vii)

- Restricting investment choices [½]
- Perhaps with-profits [½]
- Or defensive assets [½]
- Change definition of guarantee – if it is over longer term then less likely to bite [½]
- If 0% is after expenses change to before expenses [½]
- Insurance [½]
- Get some sort of parent company guarantee to pay cost of underpin [½]
- Reduce contributions [½]
- Restrict eligibility [½]
- Guarantee applies only for active members [½]

[Maximum 3]

(viii)

- Guaranteed annuity rate [½]
- The member can use their pot at retirement to buy a pension at a pre-determined rate [½]

- Collective DC scheme [½]
- Fixed contributions, risk shared by scheme members, amount paid out depends on funding [½]

- Deferred annuity [½]
- Contributions each year can be used to buy a deferred annuity from scheme [½]

- Retirement income guarantee [½]

- Fund set up to pay pensions beyond certain age – removes longevity risk [½]

- Investment guarantees through insurance [½]
- Member has no downside risk, but loses some upside risk [½]

- With-profit funds … [½]
- … where the risk is shared between the member and the provider of the fund (usually the investment business or insurance company). [½]

- Employer-funded "smoothing fund" … [½]
- … where the employer pays a percentage of core contributions into a central fund which is used to manage a targeted income at retirement [½]

- DB underpin … [½]
- … where the employer meets the cost when the underpin bites. [½]

[Maximum 3]

[Total 38]

Part (i)	This question covered Core Reading bookwork and answers were spilt between those who knew this material well and those who did not.
Part (ii)	Good differentiating question. Most candidates got the prudence versus best estimate point, but only the best candidates could think more widely and score highly.
Part (iii)	Some candidates talked more widely about scheme design rather than focussing on the guarantee. Some candidates did not read the question properly so missed that there were two elements to it – design and risks.
Part (iv)	Most candidates got the obvious points e.g. contributions, but many did not include the mechanics of how the guarantee could work fully.
Part (v)	Some candidates struggled with this part.
Part (vi)	Many candidates struggled to generate sufficient points.
Part (vii)	Most candidates got the more obvious points; good candidates were able to think more widely.
Part (viii)	Generally well answered.

END OF EXAMINERS' REPORT