Institute of Actuaries of India

Subject SP4 – Pensions & Other Benefits

December 2022 Examination

INDICATIVE SOLUTION

Introduction

The indicative solution has been written by the Examiners with the aim of helping candidates. The solutions given are only indicative. It is realized that there could be other points as valid answers and examiner have given credit for any alternative approach or interpretation which they consider to be reasonable.

Solution 1:

i)

Reduction in cost of long-term care

- Life expectancy is shorter than the developed Countries
- Fewer individual will reach old age and so require long term care
- Higher fertility rates result in larger families to provide care for their elderly
- There may be more of a culture of care being provided by the extended family [Max 3]

ii) Reasons for increased cost burden

- More people reaching age 60 due to improving life expectancy, however, the decrease in cost burden in long-term health care shows that this may not be the probable reason
- People living longer after age 60, and therefore receiving pension payments for longer, due to improving life expectancy, however, the decrease in cost burden in long-term health care shows that this may not be the probable reason
- Birth booms in the past and falling birth rates in recent times, together with improvements in longevity, leading to a lower ratio of working to retired population (However, this may again may or may not be a probable reasons as there has been a reduction in the long term care) If the scheme is being financed via a pay-as-you-go approach, then this means an increased burden is placed on the (smaller) working population.
- People working for fewer years, e.g. more people in higher education so they start work later. This means overall less in contributions, but as long as 10 years of contributions are made the full pension is received.
- Contributions set at too low a level initially or not reviewed upwards as necessary.
- Price inflation being higher than expected, and therefore inflating benefit costs.
- If funded in advance, investment experience poorer than expected (in particular if less than price inflation) or funds invested for shorter periods than expected.
- Fraud or non-payment of contributions. [6]

iii) Measures to ease the problem and problems of implementation

General comment

Alongside any step to reduce costs, the State may carry out an education program to encourage individuals to make sufficient private savings to ensure sufficient benefit provision overall.

Any change may cause difficulties for occupational pension schemes which are trying to integrate with the State scheme.

Eligibility for benefits

The benefit could be made available to fewer people. One way of achieving this is means testing, based on income and/or assets. This means the State can focus on benefit provision for the needy rather than provide a flat-rate benefit for all. It can be structured in such a way as to reduce costs.

However:

- It is unlikely to be popular with high earners, and may be felt to be too redistributive.
- It is difficult to determine and operate the basis for means-testing; in particular administration and communication will become more complex.
- It is difficult to implement immediately, since it will be deemed unfair by those who have already met the current contribution requirements or are close to retirement.
- It may create a poverty trap and encourage individuals to squander wealth which would otherwise be offset against benefit entitlement.

Alternatively, eligibility conditions could be tightened:

- Currently all citizens who have paid at least 12 years of contributions receive the full benefit. The number of years of contributions required to receive the full benefit could be increased from 12 years to say 18 years, with a view to increasing this further.
- Increasing the number of years of contributions is likely to be unpopular and can only be achieved by gradually phasing in over time. This ensures that individuals currently close to retirement are not affected.
- Years of contribution credit may need to be awarded to those who take career breaks. For example, those raising a family or caring for elderly parents, so that people carrying out such activities can still achieve a full benefit.
- Introduce a requirement that the individual is still a resident of the country in retirement in order to receive the full benefit.
- Requiring residency in order to receive payment is also likely to be unpopular and is difficult to implement immediately, e.g. for those currently retired abroad or those close to retirement who are abroad.

Reduce the level of the benefit

The benefit amount could be cut, and this would lead to an immediate fall in costs.

However, such a move is very unlikely to be politically acceptable.

An alternative is to reduce the level of any dependant’s benefits. But again is likely to be an unpopular measure.

Reduce the rate at which benefits increase

The benefits currently increase each year with price inflation. The rate of increase could be reduced, and this is a more acceptable solution than cutting the headline level of the benefit.

One possible option is to cap the rate of increases, eg the lower of price inflation and x% each year. This may be an appropriate solution if the reason for the increasing costs is that price inflation has been very high.

This move may be unpopular and its effect will only be felt over several years.

The provision of price inflation increases maintains the purchasing power of the pension, if pension increases are reduced then the purchasing power of the pension is eroded over time.

Increase contributions

The contribution rate and/or number of contributors could be increased, so additional monies are available to meet the increasing benefit cost ...

this may involve increasing the contribution rate for individuals and/or employers. This measure does not curb costs, but instead acknowledges that costs are increasing.

Its implementation may be unpopular. Alternatively, the rate could be amended to be dependent on the level of earnings or age. This could lead to higher overall contributions but may be unpopular with certain groups, eg with high earners if the effect is felt to be too redistributive.

Increase the retirement age

Increasing the retirement age has the following effects:

- individuals contribute for longer whilst working
- individuals are retired for a shorter period of time, and therefore receive lower total benefits.

Such a step cannot be implemented over-night, as individuals currently close to retirement will have based their retirement plans on the current State pension retirement age.

Such a change may cause difficulties within the labour market. Can the market sustain individuals working to the new later retirement age?

Change the type of arrangement

A radical design change could be implemented, changing to defined contribution or a lump sum benefit for all benefits accruing in the future. This would mean post-retirement longevity risk is removed.

Individuals may end up with a small benefit, and may not meet paternalistic aims of the State.

There will be high education, administration and system costs of making such a change.

Also decisions would need to be made about the appropriate investment strategy if funded, eg a defined contribution arrangement is likely to be funded.

Change to a funded approach

Assuming a pay-as-you-go approach is being used then the current generation would be required to pay twice. Also are sufficient investments available and what would be the macro-economic impact?

Encourage private pension schemes

Allowing and encouraging members to opt a personal pension or occupational scheme, can transfer risk to the private sector.

This may not meet the State’s paternalistic desires.

Encourage larger families or immigration of younger workers

For example, provide incentives for the birth of each child or make immigration easier.

This is a very long-term fix and eventually this generation will also need to receive benefits. [8]

iv) Tax concessions

The tax concessions could apply to:

- employer contributions – deducted from profits before deduction of any corporation tax [½]
- employer contributions – individual not taxed on them, ie not classed as taxable benefit in kind [½]
- employee contributions – deductible for tax purposes [½]
- alternatively all contributions could be subject to a lower level of tax than otherwise (eg than earned income or profits) [½]
- investment income (eg dividends, rental income, coupons) to receive beneficial tax treatment [½]
- investment growth (realised and unrealised gains) to receive beneficial tax treatment [½]
- pension to receive beneficial tax treatment, eg not taxed as income [½]
- cash lump sum to receive beneficial tax treatment, eg not taxed as income [½]
- death benefits to receive beneficial tax treatment, eg not taxed as income [½]
- benefits (pension and/or lump sum) subject to a lower level of tax than otherwise (eg earned income). [½]

[Max 4]

v) Restrictions on early retirement benefits

Timing

Minimum retirement age – say from 58 to 60 or 65 to ensure individuals have enough time to save sufficiently for retirement and continue to contribute to State benefits. [½]

Level

Minimum benefit compared with the benefit that would have been received on normal retirement, eg maximum early retirement reduction – to ensure that employers do not pay proportionately low benefits leaving members with insufficient income. [1]

Maximum benefit, possibly as a proportion of normal retirement benefit – to ensure individuals do not accrue a very high level of benefits, exploit their tax positions and cease contributing to State benefits.[½]

Minimum length of service after which the member must receive a benefit, eg two years – to aid the employer in avoiding relatively high administration costs of paying a low pension benefit which may discourage the employer from offering a pension scheme. [½]

This time period should not be set at too high as this would result in more members' not receiving retirement benefits. [½]

Maximum length of service on which the benefits can be based – to ensure individuals do not accrue a very high level of benefits and exploit their tax positions and to ensure employers provide value for money if otherwise benefits would be restricted (eg under tax requirements) or poor value for money compared with member contributions. [½]

Form

A maximum amount of cash lump sum that can be taken, or … [½]

… a minimum level of residual pension and dependant's pension after cash is taken … [½]

… to ensure individuals use the pension savings to provide for a sufficient retirement pension and do not therefore become dependent on the State. [½]

[Max 4]
[25 Marks]

Solution 2:

i) *Criteria for choosing funding strategy*

- Stability – stability of contribution rate in normal course of events;
- Security – the ability to meet the benefit expectations in all events;
- Durability – similar to stability; it relates to the stability of contribution rate when there is a major event, *eg* closure, lots of leavers, lots of new entrants;
- Realism – a realistic measure on a year to year basis of the long-term costs of the benefits;
- Liquidity – availability of sufficient funds to pay the benefits as they are due;
- Flexibility – the ability of the sponsor to choose the timing of contributions;
- Opportunity cost – comparative returns available on money invested in the benefit scheme and money invested elsewhere. [½ mark for each criterion, **Max 3]**

ii) *Considerations in determining an appropriate investment strategy*

Liability profile

The average term of the liabilities will be very long when the scheme begins. The term of appropriate assets will reduce over time. [½]

The nature of the benefits is also important in assessing the suitability of the assets. [½]

Early on, the liabilities will mainly be linked to earnings. As the scheme matures, more benefits may be linked to price inflation or may have fixed increases, depending on the nature of the benefits provided.[½]

Fund size

Early on there will be limited funds available and so some investment classes may not be suitable because of their size, *eg* direct property investment. In the longer term, new classes may become available as the scheme grows. [½]

Level of risk / security

The views of the trustees and the sponsor should be sought so as to ascertain their attitude to risk. [½]

The strength of the sponsor covenant should also be assessed. [½]

A more aggressive investment strategy could be adopted to try to increase returns and hence reduce costs … [½]

… the downside is that there is a risk of a significant deficit if experience turns out to be worse than expected, resulting in increased costs and a volatile contribution rate. [½]

The scheme could minimise the probability of deficit by holding assets that closely match the liabilities. However, the cost of doing so may be unacceptably high in terms of lower investment returns … [½]

… furthermore, surpluses are less likely to arise and hence members are less likely to be granted benefit improvements. [½]

The consequences of poor investment performance are less significant for an immature scheme … [½]

… it may therefore wish to follow a policy of deliberately mismatching, in order to benefit from higher expected returns from assets that do not closely match the liabilities. [½]

The scheme may consider investing a greater proportion of the scheme in equities, which historically have outperformed government bonds over the long term, but have extra risks associated with them, including default and volatility. (Questions also need to be asked about future returns on equities verses other investments.) [½]

Funding level

The healthier the funding position, the greater the level of investment freedom, increasing the scope to mismatch. [½]

Liquidity

For an immature scheme, benefit outgo is low and therefore can be paid out of contribution income. [½]

Liquidity will therefore not be a major issue and the scheme will have less need to invest in marketable and high yielding assets. (Although assets with a stable market value may be desirable assuming market-related valuations are carried out). [½]

Consideration should be given to any protection benefits offered, for example a lump sum payment on death in service could lead to liquidity risk for an immature scheme with only a small fund, which may lead to insurance being used. [½]

Diversification

A diversified portfolio of assets reduces risk. The optimum position between diversification and minimising investment costs needs to be sought. [½]

Restrictions / legislation

The State may restrict the types of investments held. For example, it may restrict the level of self-investment or set levels for minimum / maximum holdings of different types of investment. (The way statutory tests are carried out may also encourage certain investments, *eg* holding assets with a stable market value.) [½]

Tax position

The tax implications of holding certain investments should be considered. The return net of tax is the key issue. [½]

Investment expenses

The expenses associated with investment should also be considered. The return net of expenses is the key issue. [½]

Ethical / moral issues

The trustees and/or sponsor may choose to avoid certain investments from an ethical / moral viewpoint. [½]

Competitor schemes / benchmarking

The scheme is unlikely to want to risk poor performance compared to its peers, and may want to specify that the managers should not deviate significantly from the investment strategy followed by competitors' schemes (although this should not be a primary consideration). [½]

[Max 9]

iii) ***Comment on trustee's suggestions***

Land

- May not produce an income. [½]
- Marketability is likely to be poor. [½]
- May be expensive to manage *eg* requires expertise, risk that use may be
- restricted. [½]
- Large unit size. [½]

Physical Gold

- Produces no income. [½]
- Very volatile market values, as generally a speculative investment. [½]

Company property

- Increases the risk to security of member's pensions due to dependence on the
- fortunes of the sponsoring employer. [½]
- A large percentage of the fund invested in a generally illiquid asset. [½]
- May breach regulations on self-investment. [½]

Index Linked Bonds

- For a defined benefit scheme, index-linked bonds have the following advantages:
- guaranteed real returns if held to redemption
- diversification from shares.
- Their disadvantages include:
- a lower long-term return than some other asset classes
- potentially lower marketability than for fixed-interest bonds. **[Max 4]**

iv) Fixed-interest bonds may be held because they are a good match for liabilities, for example they may be a good match for: [½]

- actives, if part of the pension benefits can be taken as a fixed amount of cash at retirement [½]
- current pensioners, if pensions are level or have fixed increases [½]
- deferred pensioners, if pensions have fixed increases between the date of leaving and retirement. [½]

The bonds are issued in the domestic currency and therefore a good currency match for the liabilities. [½]

Fixed-interest bonds have a high running yield and therefore may be held if the scheme needs a higher income from its assets to match outgo (*eg* if the scheme has negative cashflow which may be the case if the scheme is quite mature). [½]

Fixed-interest bonds may be held for diversification from other asset classes. [½]

Fixed-interest bonds may be issued by governments or companies; the two types may be held for increased diversification. [½]

Fixed-interest bonds (in particular government bonds) may be held as it is felt they are a very secure investment (*ie* low risk of default). [½]

Fixed-interest corporate bonds may be held as they offer a higher expected return than government bonds. [½]

Fixed-interest bonds may be held if the scheme has a policy of buying-out benefits that are level or have fixed increases though an insurance company at retirement (since annuities are backed by bonds and therefore move in line with bond prices). [½]

A high proportion of fixed-interest bonds is likely to be held by a scheme that will shortly purchase immediate and deferred annuities from an insurer. [½]

At certain times it may be felt that fixed-interest bonds are cheap (*ie* offer attractive returns), relative to other investments. [½]

[Max 4]

v) ***Investment characteristics of bonds compared to equities***

Security

The security of the bond depends upon the issuer. Government bonds issued in most developed countries have negligible risk of default, whereas corporate bonds are more risky (depending upon the credit rating of the company).

The security of equity again depends upon the issuer, but generally speaking equity investment is less secure than bond investment.

Yield

The yield available on an investment will reflect its perceived risk. A higher yield will therefore be expected on a corporate bond than a government bond. In the long term the yield on equities is expected to exceed that on bonds.

The running yield on bonds is usually higher than on equities.

Spread (stability of price over time)

Short-term bonds have a stable price over time, the longer the outstanding duration of the bonds the more volatile its value. Fixed-interest bonds can be volatile in real terms.

Equity prices tend to be volatile from day to day.

Term

Bonds are available with a variety of terms (for example, in the UK up to 25 – 30 years), also there are some undated bonds and bonds with a choice of redemption dates (the choice being at the discretion of the borrower).

Convertible bonds are also available which convert to equity at a future date.

Equity is usually viewed as being held in perpetuity.

Expenses

Dealing costs on bonds (particularly government bonds) tend to be low relative to

equities.

Marketability

Marketability depends upon the issuer, for both types of investment there may be unlisted stock which is less marketable.

Government bonds are very marketable, the marketability of corporate bonds is also generally good. There can be liquidity issues for corporate bonds.

Listed equities have good marketability, although generally not quite as good as bonds.

The marketability of private equity is not generally as good.

Tax

Bond investments often receive preferential tax treatment relative to other types of investment.

Bond investments give more of their return through income than capital compared to equity investment. Indeed some equity investments are primarily aimed at capital growth with little or no dividend being paid.

The tax efficiency of the two investments depends upon how the investor (the scheme) is taxed on income relative to capital.

Nature

Bonds which are fixed-interest in nature provide a stream of income and a set redemption payment.

In some countries (*eg* UK and USA) index-linked bonds are available which provide stream of income and a redemption payment linked to price inflation, by giving a return a set percentage above price inflation.

Full inflation protection is not always achieved due to the lag between the index used for setting the coupon and the inflation rate at the current time.

Equities are real investments giving a stream of income liked to the company's profits.

Some studies show a link between the dividend stream and salary growth such that, in the long term, it is expected to broadly increase with salary growth. There is no redemption payment.

Currency

Bond and equity investments may be purchased overseas too. This gives additional diversification and the chance of achieving higher returns but these advantages need to be weighed against the currency mismatch that will be introduced, given a scheme's liabilities will be in the domestic currency. [5]

[25 Marks]

Solution 3:

i) How ALM can help in determining investment strategy

ALM can assess different asset allocation strategies by simulating thousands of times the range of possible outcomes after adopting the various different strategies … [1]

… i.e. many simulations can indicate which strategy gives the best expected return for a specified level of risk. [½]

Often the model is kept reasonably simple, i.e. splits assets only between "equity types" and "bond types" or between real and fixed. [½]

The objectives of an investment strategy need to be set. These objectives must be clear and measurable. [½]

For example, the objective can be to maximise the investment return subject to the probability of the funding level falling below 90% being less than 1% (if contributions are paid at the standard contribution rate). [½]

More generally, ALM can be used to test asset allocation strategies allowing trustees to choose their preferred trade-off between risk and reward. [1]

The results will depend on the assumptions made, thus they should be tested for robustness by carrying out sensitivity analysis. [1]

ALM can be used to assist in the long-term asset allocation strategy, but cannot be used to suggest short-term tactical deviations from this strategy. [1]

Limitations:

● Subjectivity in selecting assumptions and likely to involve some simplification.

● Model is sensitive to small changes in assumptions.

● Can model broad asset classes but difficult to separate many individual asset classes.

● Does not deal with stock selection.

● The results are only as good as the assumptions and model and therefore overreliance should not be placed upon them.

● Should also look at impact of proposed strategy on the discontinuance position too.

[½ mark for each point]

[Max 8]

ii) Salary experience investigation

There are two aspects to investigate – general increases and promotional / age-related increases. [½]

These are difficult to distinguish in practice. [½]

Need to use data for members present at both valuation dates … [½]

… otherwise you will be looking at the experience over two different populations and the answer may be inappropriate. [½]

One method is to develop a table which compares for various age groups the average salary at this valuation and the average salary at the last valuation. Any increase is due to both general and promotional increases. [1]

This can be compared with what was expected. [½]

To analyse promotional increases separately you need to identify the overall cost of living increases awarded each year over the inter-valuation period. [½]

This is most easily done with the company's help. [½]

Alternatively for each age group you could compare the average salary of all members at the last valuation with the average salary of all members at the current valuation.

This should indicate the general increase in pay excluding promotional increases. [½]

However, this figure can easily be distorted and should be treated only as a rough guide. [½]

National salary inflation and industry benchmarks can also be a useful indicator. [½]

Once the actual cost of living increases have been identified, this can be removed from the figures to identify the actual promotional increases … [½]

… and hence compare against expected promotional increases. [½]

[7]

iii) Possible courses of action

Lump sum contribution

This may be necessary if the funding level is significantly below that required by legislation. [½]

In particular it could be necessary if there is also a large deficit on a discontinuance basis. [½]

Level cash contribution

This might be appropriate if there is a discontinuance deficit that requires removal over a short future period, but not immediate removal. [½]

This is useful for schemes where salary roll is volatile, e.g. a small scheme or one that is reducing in size.[½]

Cash contribution linked to an inflationary index

This could be used in the same circumstances as the level cash contribution. [½]

Additional % of salary for the future working lifetime of current members

This may be suitable when there is no pressure for rapid removal of the deficit, e.g. if no discontinuance deficit. [½]

This may be a suitable approach since it is likely that the standard contribution rate is also expressed as a percentage of salary. [½]

Pay additional % of salary temporarily

This may be more appropriate than an additional % of salary over the future working lifetime if there is pressure from members to remove the deficit more quickly. [½]

Combination of any of above

For example, could correct part of the deficit immediately with a lump sum payment and remove the remaining deficit gradually through regular payments. [½]

Do nothing

This may be the most suitable action where the deficit is small and there is no discontinuance problem.[½]

This can be justified on the grounds that experience fluctuations will mean that small surpluses and deficits are to be expected. [½]

Don't grant discretionary pension increases

This may be a suitable way of preventing the deficit from getting any worse. However, if the increases are funded for, it may be viewed as unfair on the current pensioners and so only used as a last resort. [½]

Reduce accrued benefits

This may not be permitted under legislation. Even if benefit reductions are allowed, they will be very unpopular with the membership. [½]

Limit transfers from the scheme

In order to prevent the position from deteriorating further, transfers from the scheme could be suspended or reduced to allow for the deficit. This will protect the security of the benefits of the remaining members. [½]

Reduce future benefits

This would not result in a quick correction of the deficit and so would not be suitable on its own if the scheme discontinues. [½]

However, it will prevent the situation from getting worse and remove the deficit in a similar way to the % of payroll approaches, provided that the sponsor doesn't reduce its level of contribution. [½]

Wind scheme up

The last resort – it won't correct the situation but will prevent it from getting any worse. [½]

Altering the valuation basis or method

This is only appropriate if the previous basis or method was unduly cautious. There is no point in hiding a deficit through a weak valuation basis or method. [½]

[Max 10]

iv) The impact immediately after the scheme has closed will depend on whether members retain their salary link on their accrued benefits. [½]

If members retain their salary link, there is little effect on the liabilities in the short term. [½]

The scheme would still have a mixture of liabilities – salary-linked for members who were actives immediately before closure and price linked and/or fixed for deferred pensioners and current pensioners (depending on the deferred pension and pension increases granted). [½]

In such circumstances it is appropriate to back active members' liabilities with equities or index-linked bonds to provide a broad match for salary growth. [½]

Deferred pensioner and current pensioner liabilities are matched by index-linked or fixed-interest bonds (depending on the pension increases granted pre- and postretirement). [½]

If members do not retain their salary link, then the liabilities with respect to the members who were actives immediately before closure will instead be linked to the increase granted in deferment. [½]

Their liabilities will be best matched with index-linked or fixed-interest bonds (depending on the deferred pension increases granted). [½]

Liquidity may be an immediate concern since there may be no future contributions. The liquidity concerns are enhanced if transfer values and/or retirement lump sums are offered. [½]

If several members opt to take a transfer value then the size of the remaining liabilities may be substantially reduced. This may mean: [½]

- More care is required in ensuring assets are well diversified. [½]
- The scheme should be more risk averse in choosing its investments and hence move to a better matched position. [½]

The investment strategy will need to change to reflect this, i.e. there will be an increased holding of marketable, liquid assets with stable market values. [½]

Over time, the scheme will mature. This means: [½]

- there will be fewer deferreds and more pensioners, suggesting an increased holding of bonds that match the pension increases in payment [½]
- the term of the liabilities will reduce, suggesting less risk should be taken as the time to correct the position is reduced and shorter-term assets should be held [½]
- there will be a relatively higher level of benefit outgo, suggesting a greater need for liquid assets and for assets with a higher running yield to meet benefit outgo. [½]

As the scheme matures, matching may become more important. However, this partly depends upon the willingness and ability of the employer to make future cash injections if necessary. In turn, this may depend on the reasoning behind the closure of the scheme. [1]

An asset liability modelling exercise could be carried out to identify the optimal strategy. [½]

As the scheme matures further the size of the membership will fall. There will come a point in time at which it is sensible to wind-up the scheme and secure the remaining deferred pensioner and current pensioner liabilities with an insurance company, through the purchase of deferred annuities and immediate annuities. [1]

The pricing of these annuities is likely to be based on bond yields and the scheme should move to a matched investment position prior to wind-up. [½]

[Max 10]

v) If the scheme is expected to continue to run as a closed scheme, the assumptions may differ from those of an ongoing valuation. [1]

For example, the assumed investment return may be lower for a closed scheme to reflect a more conservative investment policy. [1]

The ongoing valuation will use long-term assumptions that can take into account the expected return from a portfolio of assets that will probably contain a significant proportion of equities. [½]

In the long term these are expected to provide a better return than government bonds. [½]

If the scheme is assumed to continue in a closed state, the valuation of the liabilities will need to reflect the term over which the scheme can continue in this manner. [1]

The assumptions for a closed scheme may be more prudent [1]

The trustees may want to reduce their reliance on the strength of the sponsor [½]

[Max 5]

[40 Marks]

Solution 4:

i) The Attained Age Method of funding was used, hence the death-in-service benefits would have been valued using a formula:

Present value of benefits to expected death / Present value of 1% of salary to expected death [2]

ii) The average cost of benefits for the period is likely to be much higher than the current cost, since it effectively assumes an ageing workforce and that the cost of death benefits increases with age. [1]

The insurance premium is likely to be the expected claims cost over the next year only plus expenses, i.e. close to current cost. [1]

The insurance cost might be less than you expect the cost of death benefits to be because of:

- competition [½]
- heavier than average mortality in the scheme, which has not been reflected in the premium rates. [½]

The insurance may not relate to the whole death benefit … [½]

… (e.g. may exclude spouses' pensions) [½]

The valuation basis may be prudent, giving a higher estimated cost. [1]

For example:

- spouse's death-in-service annuities based on a long-term interest rate, not the current interest rates[½]
- implicit or explicit allowance for discretionary pension increases. [½]

The insurance company may have lower expenses. [½]

[Max 8]

[10 Marks]

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