Question 1

(i) What are the common aims that most accounting standards are attempting to achieve when providing disclosure to owners of capital through a company's formal accounts? [2]

(ii) In order to achieve these aims, what possible disclosure requirements may be needed? [4]

[Total 6]

Question 1 solution

This was a theory question and was mostly competently answered.

(i)

- Recognising the realistic costs of accruing benefits
- Avoiding distortions resulting from fluctuations in the flow of contributions from the employer to the pension scheme
- Consistency in the accounting treatment from year to year (although not necessarily from company to company)
- Disclosure of appropriate information

(ii)

- The elements of the basis used
- The actuarial method used
- The value of liabilities accruing over the year
- The increase in the past service liabilities at the start of the year
- The investment return achieved on the assets over the year
- The surplus / deficit over the year
- The change in the surplus / deficit over the year
- The pension cost over the year in respect of any directors

Question 2

You have been asked by the trustees of a defined benefit fund to assist with the introduction of a commutation option on retirement for members.

i) Describe this option and state the factors to consider in setting the terms for the option. [3]

ii) The fund currently has a spouse's benefit. What is the potential problem that commutation poses for a member's partner? How can this be avoided? [1]

iii) One of the trustees has suggested that a single fixed commutation factor be used for all members retiring from the fund. What should the trustees consider when deciding whether to follow this approach? [8]

[Total 12]

Question 2 solution

Candidates did not address the issue of factors in part (i) well. Most candidates struggled to generate sufficient thoughts to gain all the marks for part (iii).

(i) Description:

- Retiring members surrender a portion of their pension in exchange for a lump sum
- A commutation factor is established that will be used to convert R1 or surrendered pension to the lump sum
- Pension surrendered = Commutation lump sum / Commutation pension

Factors:

- Basis may be based on the valuation basis or may be more realistic
- Strength of the basis depends on the post-retirement assumptions
- Not prudent – as giving members share of surplus
- May want to introduce a maximum amount that can be commuted – members might prefer more cash now, but then have nothing to live on after it is used up.

(ii) If the partners pension is reduced proportionately, the partner may have insufficient to live on. Can address by basing the partner's percentage as a percentage of the pre-commutation pension.

(iii) For:

- Easy to understand
- Easy to administer
- Cheap to administer
- May seem fair to members

Against:

- Impossible to achieve cost neutrality
  - Male members have different mortality to female members
  - What about members retiring early or late?
  - What basis used to set the factor?
    - Pension increase allowance?

        - Discount rates
        - What happens when the valuation basis is changed?
- How often would the factor be changed?
- What circumstance would trigger a recalculation?
- Risk of anti-selection - depending on the level of the factor, the terms could seem attractive or unattractive to members, and would then change if they commute and/or how much they commute.

Question 3

You are the actuary to a defined benefit fund sponsored by a large retailer. The financial director of the retailer has approached you about introducing a new defined contribution fund for members instead of the defined benefit arrangement.

The defined benefit fund currently has the following assets and liabilities, valued on a best estimate basis:

Active members	R200 million
Pensioners	R 90 million
Deferred pensioners	R 54 million
Total market value of assets	R 330 million

Active member liabilities are valued using the projected unit method. Pensions are currently paid from the fund.

The defined benefit fund does not offer a cash benefit on withdrawal. Members who leave the employment of the company are required to leave their accrued pensions in the fund, and these become payable at the fund's normal retirement age of 60.

i) What are the scheme design considerations you would advise your client to consider when setting up the defined contribution arrangement? [16]

ii) How would you go about setting the total contribution rate to be paid towards retirement in a new defined contribution fund? [4]

iii) The financial director would prefer to convert the existing defined benefit fund into a defined contribution fund. Outline the major factors that would need to be considered during this conversion process. [10]

iv) The chief executive office (CEO) of the retailer would prefer to discontinue the defined benefit fund and set up a new defined contribution fund as she hopes this will address the problem of the deficit in the defined benefit fund. Briefly outline your response to the CEO, highlighting the principles to be taken into consideration when determining discontinuance terms. [5½]

v) The trustees of this fund are concerned about the strength of the sponsor covenant and would like this assessed. List the credit assessment techniques that could be used. [3½]

[Total 39]

Question 3 solution

The question required candidates to cover a number of different aspects of a conversion from a defined benefit to a defined contribution fund. Candidates who knew their work well were able to use the theoretical frameworks as a guide to generating sufficient points to gain marks. Candidates also needed to know the difference between a conversion to a defined contribution arrangement and a discontinuance of the defined benefit fund. Part Iii) was poorly answered.

i)

Aims of the new arrangement

- how will it integrate into the other benefits and the overall remuneration package of the company
- What are the main aims of management for suggesting this change?
    - Limit costs
    - Flexible arrangements?
- Is the aim to be consistent with the benefit levels currently provided by the DB scheme?
- If not, the impact on employee relations, and the implications for new employees who have had their conditions of employment altered

Eligibility

- Who will join the scheme? Temporary and permanent staff? As a retailer may have a number of temporary staff on the payroll.
- When will employees be able to join? Immediately? Waiting period?
- Will there be age limits – normal retirement age is 60 – must be consistent in the new scheme.

Contribution rates

- On what basis will the contribution rates be set?
- Will they be a flat rate of pensionable salary? Age-related? Service-related? Linked to category of worker.

Form and type of benefits

- Will the fund pay a pension at retirement or a lump sum? If a pension, will this be paid from the fund or will annuities be purchased? If paid from the fund, investment risk and longevity risk remain in the fund.
- On what events will benefits be paid?
    - Retirement
    - Death
    - Disability
    - Withdrawal
- Will members be able to access their withdrawal benefits in the new arrangement or will these remain until retirement as in the DB fund?
- What level of flexibility will be allowed? Flexibility adds to the complexity of administration and the expense.

Existing employees

- Will the arrangement be applicable to new and existing employees? Will existing employees be compelled to join the new scheme in respect of future service
- Will they be able to transfer their existing benefits into the new arrangement?
- If not, what form will the existing DB benefits take?
- What will happen with the deferred pensioner members? There is no relationship with the employer anymore. Will there be a facility for them in a DC arrangement? Their benefits are DB in nature.

Investments

- What investment strategy will be followed?
- Will members have investment choice? Will life-styling be offered? The staff of a retailer are unlikely to have a high level of knowledge of investments.
- Will advice be provided to members? Who will bear the cost of this?

Expenses

- Who will pay the expenses incurred by the fund?

External factors

- Comply with legislation
- Level and types of benefits offered by competitor's schemes

ii) Setting the contribution rate

- establish from the employer the desired benefit to be targeted by the fund
- this would usually be in terms of a net replacement ratio
- assume an entry age for members, say 25 years of age
- derive the benefit accrual rate per year that would be needed to provide the target NRR over the 35 year working lifetime assumed
- use the EA method to derive the SCR that would need to be paid over the 35 year period towards retirement to fund the targeted benefit
- use best estimate (realistic) assumptions

iii) Conversion process (max 10)

Current funding position

- The DB fund is currently in deficit. How will this be treated? If the employer does not fully fund the deficit, the member's benefits will possibly be reduced in the new DC fund. May not be allowed in terms of legislation. Most likely the employer will have to fund this deficit – either via increased regular contributions or a once-off payment into the fund.

Member's existing credits:

- How will member's accrued benefits be treated?
  - Active members
    - Opening balance in the DC fund is the AL of the DB arrangement?
    - Basis is best estimate and PU so should be a realistic level of liabilities
    - Past service benefit changed to DC? Negotiation with staff needed.
  - Deferred members

- Benefit to be transferred to new fund? Currently DB. How will this be done? Can the members be traced to communicate with them? Can it be converted to a DC arrangement?
- Benefit paid out to members?
- Transfer to another retirement arrangement?
- If they do transfer into the DC fund, how will the pension be treated at retirement?

- Pensioners
  - How will these be treated in the DC arrangement?
  - Still pay pensions from the fund – maintain investment and risk
  - Purchase pensions from an insurer
    - Cost implications – insurer will charge for the guarantees, expenses and profit
- Communication
  - The new arrangement will need to be communicated to all stakeholders
  - Members may want a projection of benefits to see what their new expected benefits will be
- Guarantees
  - Will any minimum benefits or DB underpins be offered to existing members?
- Investments
  - Under the new arrangement, the investment risk will move to the members.
  - Investment portfolios may have to change
  - Cost implications
- Cost of the conversion exercise
  - Who will bear these costs?

iv) Need to consider:

- Rights of the beneficiaries
  - Depends on scheme operation and legislation
- Expectation of beneficiaries
  - What benefits they do expect or can reasonably expect? Eg inflation protection
- How will discontinuance benefits actually be provided?
  - Transfer to another scheme or insurer, pay out of benefits?
- The level of assets
  - If assets are insufficient, benefits may be reduced
  - Legislation and/ or scheme rules may prevent this especially if the employer is a going concern
  - Unlikely, in this case, that the sponsor will be able to avoid paying in the deficit by the conversion
  - Deficit may become a debt on the employer

v)

- Business outlook

- Financial metrics
- Implied market default risk
- Credit rating
- Merton-type credit risk models
- Quantitatively derived credit risk
- Independent business review

Question 4

The valuation of a small defined benefit fund has just been completed. At this valuation date, the market value of assets is R56 400 000. At the previous valuation, exactly a year earlier, the market value of assets was R34 500 000.

The expected rate of return on the assets allowed for in the basis of both valuations is 8.30% per annum. Cash flows for the year were net positive into the fund and totalled R14 200 000.

i) Calculate the surplus that has accrued in the fund over the year as a result of investment returns being greater than what was expected. [3]

ii) Explain the factors that affect how this surplus might be used. [9]

[Total 12]

Question 4 solution

Part i) was mostly well answered. Many candidates struggled to generate a wide variety of points for part ii).

i) Expected asset value at this valuation

= 34 500 000*(1.083) + 14 200 000*(1.083)^0.5

= 52 141 054.60

Actual asset value at this valuation = 56 400 000

Surplus from investments = 56 400 000 – 52 141 054.50

= 4 258 945.40

ii) Legislation:

- May require surplus to be used to increase benefits
- May indicate which categories of member should have priority for such increases

Beneficial tax treatment:

- Surplus may be excluded from beneficial tax treatment
- Sponsor will probably have to pay tax if receiving a return of surplus funds

Scheme rules:

- In setting up the scheme, the sponsor may have placed restrictions on the use of surplus
- May prevent disputes if surpluses arise

Discretion of sponsor / managers:

- May have the right to choose how surplus is used (if no legislation / rules)
- Risk exposure – those exposed to the risk benefit from the surplus?

The source of surplus:

- Taken into consideration – may apply in a way consistent with how it arose
- If volatile, may reserve the surplus

Speed of corrective action:

- Decide how quickly to use up the surplus – could potentially leave it in the fund to increase security

Industrial relations: consider the effect on industrial relations

Question 5

Express the attained age standard contribution rate in terms of the projected unit standard contribution at any age x. What can be deduced from this? [5]

Question 5 solutions

A number of candidates did not represent this relationship formulaically, and many struggled with commenting on what can be deduced from the relationship.

$$AASCR \div PUSCR = \frac{\frac{(R-x)\times S}{A}\times\left(\frac{1+e}{1+i}\right)^{R-x}\times a'_R}{S\times a_{R-x}} \div \frac{\frac{1\times S}{A}\times\left(\frac{1+e}{1+i}\right)^{R-x}\times a'_R}{S\times a_1}$$

$$= \frac{(R-x)\times a_1}{a_{R-x}}$$

(Denominators are annuities certain)

If $i > e$, then $\frac{(R-x)}{a_{R-x}} > 1$ (the annuity being calculated at *i-e)*

Hence, AASCR > PUSCR for all ages except in the last year before R when they are equal.

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Question 6

A large, mature defined benefit pension fund currently pays pensions directly from the fund. The trustees have asked for your advice on the management of the assets and liabilities in respect of the pensioners.

The most recent valuation of the pensioner liabilities, conducted as at 31 March 2013, showed the pensioner liability totalled R750 million. As at the previous valuation, conducted a year earlier, the total pensioner liability was R690 million.

i) The trustees are concerned about the change in the value of the pensioner liability over the year. What are the possible reasons for the increase in the liability? [4]

ii) The total liabilities of the fund are R 1 360 million as at 31 March 2013, including both the active member and the pensioner liabilities. The fund has total assets of R 1 540 million.

The trustees are considering managing the assets in respect of the pensioners separately from those of the active members.

a) What risks would the trustees potentially be able to mitigate through this proposed separation of assets? [3]

b) What do the trustees need to consider in implementing this proposal? Your response should include, but need not be limited to, issues related to investment strategy and the practical implementation of the proposal. [12]

iii) In assisting the trustees with their decision, you have suggested that an asset liability modelling exercise be conducted. Briefly describe the outputs from the process that the trustees can expect. [6]

[Total 25]

Question 6 solution

Candidates struggled with part i)- possibly over-complicating the issues. Many candidates also did not manage to come up with enough individual risks for part ii.a). Part iii), although a pure theory question, was poorly answered.

(i)

Increase in pension payments per month:

- Increase in the number of pensioners being paid i.e. new retirees
- Pension increase granted during the year

Change in basis:

- Increase in the future assumed pension increases
  - Possibly caused by an increase in future assumed inflation rate, if increases related to inflation
  - Possibly caused by change in pension increase policy
- Reduction in discount rate
- Change in mortality basis – allowance for lower rates for mortality
- Assume female spouse is younger than previously assumed – if most pensioners male

(ii) a)

Risk of mismatching of pensioner liabilities in terms of nature and term
Risk of not having sufficient cashflow from assets to pay monthly pension amounts
Risk of insufficient investment returns affecting pension increases
And therefore not meeting pensioner's expectations of increases
Risk that current surplus in the fund is used to enhance member benefits
Risk of future surplus generated by the pensioner liabilities is used to enhance active member liabilities
Other valid risks also acceptable

iii) b)

Investment strategy:

- Nature of the liabilities in respect of pensioners different to that of whole fund
    - Shorter durations
    - Regular, monthly cashflow requirements
    - Consider matching more closely
- What is the pension increase policy? What assets would best allow the trustees to afford these?

Practical implications

- What will happen to the current surplus? Will it be split between the active members and the pensioners? If so, on what basis? In relation to the current level of the liabilities, or will an analysis into the sources of the surplus be conducted?
- If surplus is transferred in respect of pensioners how will it be used? Create a surplus in the pensioner asset pool? Enhance current pensions in payment?
- Choice of investment manger – will a new specialist manager be chosen, or the existing managers still be used? Could consider an expert in this area?
- If the fund sets up two separate sets of investments, will the investment fees be higher in total, as each manager will invest a smaller amount?
- Will investment fees be higher if the assets are managed more closely?
- Will current assets have to be disinvested? Possibly when it is adverse to do so.
- Legislation governing the investment of assets would still need to be complied with

Other

- If the assets are closely matched, may be that the expected return on the assets backing the pensioner liabilities will be lower – hence the valuation discount rate may be revised downwards. This would impact the valuation – higher pensioner liabilities – lower surplus, possibly lower pension increases.

(iii) For any given investment policy, statistics – mean, standard deviation, percentiles – on the distribution of possible future valuation results at the horizon time.
Can be expressed as funding levels, contribution rates, discontinuance solvency level, reported pension cost etc.
A range of sensible investment strategies for a particular set of risk and return assumptions.
"Efficient frontier" – usually obtained by a mean variance optimiser.
Statistics on the distribution of net cashflow from the fund for each year during the period up to the horizon time
In order to assess the likelihood of having to realise assets, possibly on unfavourable terms

Results under alternative sets of assumptions / alternative input parameters to the stochastic investment model

Reporting on percentiles of funding levels, contribution rates etc.