Actuarial Society of South Africa

EXAMINATION

30 May 2011 (pm)

Subject F204 - Pensions and Other Benefits Specialist Applications

Time allowed: Three Hours

INSTRUCTIONS TO THE CANDIDATE

1. Enter all the candidate and examination details as requested on the front of your answer booklet.

2. You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only but notes may be made. You then have three hours to complete the paper.

3. You must not start writing your answers on the answer sheet provided until instructed to do so by the supervisor.

4. Mark allocations are shown in brackets.

5. Attempt all questions, beginning your answer to each question on a separate sheet.

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.

QUESTION 1

SA Manufacturing (Pty) Ltd provides a final salary pension fund for its SA employees. The Fund provides a pension on normal retirement at age 65 of 1/60 of final pensionable earnings for each year of service, where final pensionable earnings equals the average earnings over the two years prior to leaving. Early retirement without adjustment is possible from age 60 years with company consent. Pension increases are provided which aim to maintain purchasing power of at least 95% of the original pension. The death after retirement spouse's pension is based on the pre-commutation pension with a guarantee period. The statutory valuation of the Fund has recently been carried out on the attained age method. The Fund's approved valuator used the following assumptions:

Discount rate pre and post retirement	8.0% p.a.
Inflation	5.0% p.a.
General increases in earnings	6.0% p.a.
Merit / Promotional increases in earnings	5.0% at age 30 reducing to 1% at age 60
Pension increases in payment	5.0% p.a.
Solvency basis	Discontinuance matched (0.5% adjustment to discount rate)
Mortality in service	SA 85/90 light
Mortality in retirement	PA90 rated down 3 years
Retirement	60% at age 60, balance at age 65
Withdrawals	No allowance
Proportion married	90%
Spouse age difference	Male 5 years older than female

The Fund's rules state that the company's contribution rate is agreed by the trustees and the company acting on the advice of the actuary.

The company is concerned by the escalating cost of the benefits and feels that the actuary may have been too conservative in his approach to setting contribution rates. You have been appointed to provide advice to the company.

(i) List the different roles and responsibilities of the Fund's approved valuator. [6]

(ii) Considering the most commonly used valuation methods, set out the factors to be taken into account in choosing a method. [4]

(iii) Discuss the issues that you would recommend the company raises with the Fund's approved valuator when discussing future funding requirements under the following headings:

(a) Funding methods [2]
(b) Assumptions [10]
(c) Other aspects. [2]
[Sub-total 14]

(iv) Discuss the issues the valuator should consider when deciding whether or not to advise the trustees to accept a proposal from the company to fund on a less conservative actuarial approach. [8]

[Total 32]

QUESTION 2

A mining company offers a defined contribution (DC) arrangement where approximately 10% of pensionable salary goes towards retirement savings. The Fund consists of only male mine employees. Until 31 March 2011, the Fund provided death benefits in line with the benefits that were payable from its previous defined benefit fund. In particular, the spouse would receive a lump sum of one times pensionable salary and a pension of 60% of the member's prospective pension based on service to age 65 where past plus future prospective service would be capped at 40 years.

The previous Fund targeted a net replacement ratio on retirement of 75% for a full career with the company which assumes recruitment at exact age 20.

In service mortality follows SA85/90 and annuities, payable in advance, can be appropriately valued assuming AM92 and a net 4% per annum discount rate where both male and females are valued using the standard male rates. The vast majority of members are married and spouses tend to be the same age as members.

With effect from 1 April 2010 a new scale of death in service benefits operates. From that date a death in service lump sum benefit based on a multiple of five times pensionable salary plus a return of their DC member share is paid. Member share projections are provided based on an assumed real return of 3% per annum above salary inflation.

John Doe, aged 25 years, joined the company as an apprentice expecting to serve a full career with the company, he has been there for 5 years, his current salary is R50 000 per annum and he has a member share of R25 000. Samuel Dlamini is in line with the average age of the Fund at 45 years and has been with the company for 15 years. His current salary is R200 000 and he has accumulated a member share of R400 000.

(i) Determine the death in service benefits of the above two individuals under both the new and previous arrangements assuming they die immediately. You should compare these benefits in respect of each individual as well as between the two individuals. State any assumptions made. [11]

Five years later the same individuals receive new benefit statements. John's salary has increased to R80 000 per annum and his member share to R100 000 while Samuel's salary has increased to R300 000 and his member share to R900 000.

(ii) Repeat the calculations in (i) at the later date and comment on the changes that have been seen in relation to the relative benefit structures. [5]

John Doe has complained that he believes the new death in service benefit structure is unfair and prejudices younger married members when compared to the previous benefit structure.

(iii) Set out your views on this complaint, the advantages and disadvantages of the pension vs. lump sum structure and briefly propose potential solutions (and their respective risks). [10]

The company likes the idea of an age related scale for the multiple of salary part of the benefit. It has suggested that this scale should be set in five year age bands (i.e. age 20, 25 etc).

(iv) Outline the issues that need to be considered in setting such a scale and derive a scale in line with the Company suggestion so that the benefits payable are broadly consistent with the death in service benefits which applied before 1 April 2011. State any additional assumptions that are made. [14]

[Total 40]

QUESTION 3

You are the valuator to the pension fund of Company X. The Fund was established in the 1970's as a defined benefit pension fund.
With effect from 1 April 2010, the Fund's rules were amended to create a new defined contribution benefit structure within the Fund. All employees who join Company X after 1 April 2010 must join the defined contribution structure.
Employees who joined Company X prior to 1 April 2010 remain members of the Fund's defined benefit structure. There is only one defined benefit structure that applies to all defined benefit members.
The death-in-service benefits and disability benefits are identical for both defined benefit and defined contribution structure members.
The Fund also has pensioners whose pensions commenced under the defined benefit structure. The pensioner's assets within the Fund are notionally segregated from the remaining assets.
Retiring defined contribution structure members must secure their pension benefits through an annuity policy issued by an insurance company.
The Fund has completed its 31 December 2010 statutory actuarial valuation which revealed the following (all figures in R million):

	Pensioners	**Defined contribution members**	**Defined benefit members and Company**
Market value of assets	1 000	50	620
Best estimate liability	700	50	500 (attained age method)
Solvency reserve	100	-	75
Surplus	200	-	45
Contribution rate (% of salary)		Member: 7.5% Company: 10.0% plus insurance costs and expenses	Member: 7.5% Company: 10.0% (SCR under attained age method) plus insurance costs and expenses
Notes	Pension increases are discretionary. The R200m surplus will be used to support future pension increases.	Members' shares are based directly on the value of the underlying investment portfolio. Members can choose between 3 different risk profiled portfolios.	

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The Trustees have had separate requests from certain defined benefit members and from Company X to consider giving defined benefit members the option of converting to the defined contribution structure:

i) Discuss reasons why Company X may make such a request. [3]

ii) Discuss reasons why defined benefit members may make such a request. [3]

The Trustees are considering whether to proceed with the conversion on a voluntary basis or whether to make it compulsory for all defined benefit members.

iii) Discuss the advantages and disadvantages of both approaches. [8]

Company X and the Trustees agree that the conversion will be on a voluntary basis. The basic conversion value of a defined benefit member will be the actuarial reserve value on the best estimate 31 December 2010 statutory actuarial valuation basis. Company X and the Trustees have agreed that the solvency reserve and surplus can be utilised to enhance the actuarial reserve value. The Trustees have asked for your advice regarding the determination of any enhancements.

iv) Outline the reasons for considering enhancements and how you would determine the theoretical enhancements. Comment on how these enhancements might be applied in practice. [14]

[Total 28]

END OF PAPER