

EXAMINATION

4 November 2011 (am)

Subject F104 — *Pension and Other Benefits Specialist Technical*

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of EACH OF your answer booklets.*
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 in the booklet until instructed to do so by the supervisor.*
4. *Mark allocations are shown in brackets.*
5. *Attempt all six (6) questions, beginning your answer to each question IN A SEPARATE BOOKLET.*
6. *Candidates should show calculations where this is appropriate.*

AT THE END OF THE EXAMINATION

Hand in your answer booklets, with any additional sheets firmly attached to the correct booklet, AND this question paper.

<p><i>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.</i></p>
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Question 1

After the death of one of its employees, the management of KRC decide that it is necessary to provide death in service benefits to its employees. Outline the major points that the employer needs to take into account in considering the design of this benefit. [8]

Question 2

You are the actuary to Dube Inc.'s pension fund. It is an open defined benefit fund. Dube Inc. is about to be acquired by another company, Legalsure, which also has a defined benefit pension fund.

An extract of the valuation basis as at 1 January 2011 for each of the above funds is as follows:

	Dube Inc. Pension Fund	Legalsure Pension Fund
Discount rate	10%	11%
Salary increases	8%	8%
Inflation	6.5%	7%
Pension Increases	6.5%	5%
Annuity factor at age 65	16.541	14

The valuation as at 1 January 2011 produced the following results for Dube Inc. Pension Fund, where the active members liability is calculated using the attained age method:

Assets	R85 900 000
Active member liabilities	R62 000 000
Pensioner liabilities	R15 000 000

Current average age of members = 40 and the average period that payments to pensioners are discounted by is 6 years.

It has been proposed that, once the sale of the company is finalised, all members of the Dube Inc. Pension Fund will be transferred into the Legalsure Pension Fund. Both funds have an NRA of 65.

- i) What are the major issues that the trustees of the Dube Inc. Pension Fund need to be concerned about in this transfer? [13]
- ii) Calculate approximately the new surplus or deficit that Dube Inc. will have on the date of transfer if the liabilities were calculated on the Legalsure Pension Fund's basis. [3]
- iii) If the full surplus on the Legalsure basis is to be distributed among the Dube Inc. Pension Fund members, what surplus amount would be allocated to a member with a liability of R250 000? [1]

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- iv) Outline the possible disclosure requirements that may be required from Dube Inc. given this proposed transfer of members and their accrued benefits. [6]
- v) What other reasonable alternatives exist for the accrued benefits of the members if the transfer to the Legalwise fund does not take place. [2]

[Total 25]

Question 3

- i) Describe the methods that can be used to set a market-related discount rate to be used for valuing assets and liabilities. [10]
- ii) You are the actuary to a defined benefit pension scheme and have in the past used a traditional discounted cash flow approach in carrying out valuations. The scheme membership consists predominantly of pensioners, and the fund has a very small equity holding. What would you expect the impact on the results to be if the last valuation was reworked using the bond yields plus risk premium method? [5]

[Total 15]

Question 4

You are about to perform the valuation for your new client, the ABC Pension Fund. The fund has been in existence for a number of years, but this will be the first time you are valuing it. You have been given the asset, accounting and membership data needed to perform this valuation, but only have the data at the current valuation date.

- i) Other than the asset, membership and accounting data you have been given, what further information would you request from the fund in order for you to be able to perform this valuation? [7]
- ii) You would like to perform data validation checks before completing the valuation. How will these data checks be compromised by not having access to the previous valuation data or the data for the inter-valuation period? [4]

[Total 11]

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Question 5

As at mid-2010, the government of a developed country pays state pension to the following numbers of male pensioners between the ages of 70 and 74:

Age 70 last birthday	754 100
Age 71 last birthday	753 700
Age 72 last birthday	785 300
Age 73 last birthday	724 000
Age 74 last birthday	795 000

The approximate mortality rates for these ages are:

$$q_{70} = 0.0126; \quad q_{71} = 0.0282; \quad q_{72} = 0.0316; \quad q_{73} = 0.0354; \quad q_{74} = 0.0390$$

It is expected that, in the next 12 months, 732 000 pensioners will reach age 70.

- i) Stating any assumptions you make, estimate the total number of pensioners for these five ages that will be receiving pensions in mid-2011. [5]
- ii) In mid-1980, the total number of pensioners was 2 972 500. The government of the country is concerned about the sharp increase in the number of pensioners in receipt of the state pension, and the increasing life-expectancy of those on state pension.

It is feared that the current pay-as-you-go funding method is unsustainable in the light of the ageing population, and the government is considering changing to a partially funded approach.

- a) Given that a funded arrangement would require contributions from the population and that the current savings level in the population is very low, discuss the arguments for and against a funded approach. [6]
- b) The government has rejected the General Average Premium method as it results in too high a contribution rate. Detail an alternative funding approach that may be used in the context of an ageing population and the implications of its use. [7]

[Total 18]

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Question 6

You are the actuary to the George University defined benefit pension fund, and have just completed the actuarial valuation as at 1 April 2011. The fund has an accrual rate of $\frac{1}{60}$ of pensionable salary for each year of service, to a normal retirement age of 65.

Members of this fund are not required to contribute to the fund. The employer paid a single contribution into the fund during the inter-valuation period, and this was an amount of R 0.6m , which was paid on 1 April 2009. There were no membership changes during the valuation period.

Annual pension increases are implemented on 1 April each year.

The following information relates to this valuation and the previous one that was completed as at 1 April 2008:

Valuation as at	1 April 2008	1 April 2011
	Rm	Rm
Assets	145	171
Liabilities:		
Active members	94	134
Pensioners	27	25
Surplus / (Deficit)	24	12

The following financial assumptions were used for both valuations:

Interest rate:	9.5% p.a.
Salary increases:	7.0% p.a.
Price Inflation:	6.0% p.a.
Pension Increases:	4.5% p.a.

The following information is also available:

Annual pension payments on 1 April 2008, immediately after the increase due at this date had been applied	=	R2m
Annuity at Normal Retirement Age	=	16.541
Average age of active members on 1 April 2008	=	47
Total pensionable salaries at 1 April 2008	=	R22m per annum

- i) Calculate the contribution to the reduction in surplus made by each of the following over the inter-valuation period:
- Assets
 - Active liabilities
 - Pensioners
 - Contributions

[12]

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- ii) For each of items a. to d. above, give one reason for the gain or loss experienced. [2]
- iii) What other factor will also contribute to the actuarial gain or loss? What is the contribution made by this item, and hence show that the full R12m change in surplus has been explained. [1]
- iv) The sponsor is concerned about the rapid change in the fund's surplus position, and has decided to close the fund to new entrants. He has also decided to start paying on the Current Unit standard contribution rate, as it is lower than the current Projected Unit rate.

Comment on the sponsor's proposal, and make recommendations, with reasons, as to a funding method that you consider more appropriate. [8]

[Total 23]

END OF PAPER