EXAMINATION

1 November 2012 (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 seven (7) 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.

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

i) How does the projection of social security benefit expenditure differ to the projection of benefits under an occupational scheme? (2 ½)

ii) List 5 critical assumptions used in these projections of social security benefit expenditure. (2 ½)

[5 Marks]

Question 2

i) Explain the current and future options typically available to a member approaching retirement in a defined benefit fund. Include in your explanation the considerations taken into account in setting the terms for each option. (8)

ii) What major risks is the fund exposed to when offering these options? How are these risks managed? (3)

A member of a defined benefit fund is currently aged exactly 64. The normal retirement age for the fund is 65, and the pension granted by the fund at retirement is equal to 2% of the member's salary at the date of retirement for each complete year of service.

The member has enquired about the option to retire on his 67th birthday – i.e. 24 months late. The rules of the fund allow for an enhancement to the member's pension, calculated at normal retirement date, of 1.30% for every month that the member's actual retirement date is later than the member's normal retirement date.

The member currently has exactly 24 years' service, and his current annual salary is R300 000 per annum. He expects that this will be the salary on which he will retire.

The following information is also available:

$a_{65} = 15.7543$

$a_{67} = 13.6194$

$l_{65} = 998\ 000$

$l_{67} = 979\ 505$

Assumed interest rate in the valuation = 7.50%

iii) Show that the enhancement in the rules is achieving the goal of equivalence between the benefit at normal retirement date and the late retirement benefit. (3)

iv) What would be the additional cost to the fund if continued service accrual was included in the late retirement benefit, along with the enhancement? Express this cost at the member's normal retirement date. (2)

[16 Marks]

Question 3

A large employer currently operates a defined benefit pension fund for its employees. The fund provides for a pension of 2% of final salary for each year of service with the employer. Final salary is defined as the salary in the last year of service with the employer. The post-retirement pension increases by 100% of consumer price inflation each year. A spouse's pension of 50% of the level of pension is also paid at the date of death of the pensioner. The pensions are paid from the fund.

The assets of the fund are invested in the following proportions:

65% equities

30% bonds

5% cash

The employer is considering changing this defined benefit pension fund to a defined contribution provident fund, but is interested in the implications of this change.

As the actuary to the current fund, you have been asked to advise the employer on this change.

i) Compare and contrast the nature of the benefits likely to be received from the two arrangements. Include in your discussion comments relating to the contribution rates to be made under each arrangement. (12)

ii) What should be considered in assessing the appropriateness of the current investment strategy in the new arrangement? (5)

iii) What would be the most important aspects of this change to communicate to members? (2)

[19 Marks]

Question 4

An employee left her defined benefit pension fund at age 38 after 16 years' service with Blue Bank. She is now employed at Green Bank, and her salary at her new employer is 15% higher than it was at Blue Bank. The actuarial reserve value of her accrued benefit was transferred to the Green Bank Pension Fund, which is also a defined benefit fund. This transfer value was applied to purchase past service in respect of the member in the new employer's fund.

The benefit structures and key elements of the basis for each fund are set out below. The Blue Bank Pension Fund uses an Attained Age method of funding, and the Green Bank uses the Current Unit method.

	Blue Bank	Green Bank
Benefit accrual rate (per complete year of service)	2.00%	1.67%
Final salary definition	Average salary for the 3 years prior to retirement	Average salary for the 3 years prior to retirement
Normal retirement age	63	60
Pension increases p.a.	5.00%	4.00%
Discount rate p.a.	8.50%	9.00%
Salary increase rate p.a.	6.00%	5.75%
Annual rate of inflation	5.00%	5.00%
Pre-retirement mortality	SA85-90	SA85-90
Annuity rate at normal retirement age	14.218	17.543
Funding level at most recent valuation	110%	110%

i) Compare the two funding methods with respect to both the targeted funding level and the expected behaviour of the Standard Contribution rate as the fund's average age increases. (7)

ii) Given the funding method used, comment on the appropriateness of the basis used for each fund. (5)

iii) Compare the funding methods presented with respect to security and stability. Include in your discussion comments with regard to the current funding levels of the two funds. (9)

iv) How many years' service should the employee receive in the Green Bank Pension Fund, at the date of transfer, in order to target equivalence in benefits at that point? (3)

[24 Marks]

Question 5

You have just completed the statutory valuation for a large, mature defined benefit pension fund. As part of the valuation, you have completed an analysis of surplus, comparing the results of the valuation conducted three years ago, with that done now. The salary increase item in the analysis of surplus shows a loss/deficit item of close to R80 million.

Some elements of the valuation basis used at this valuation were as follows:

Discount rate 8.5% per annum

Inflation 5.75% per annum

Salary increases are assumed to be increasing by the following age related rates, in excess of inflation:

Ages 21 to 29 3.5% per annum

Ages 30 to 39 2.5% per annum

Ages 40 and above 1.0% per annum

An extract of the valuation data and results for those in employment for the full three-year period since the last valuation are shown below.

Age range	Number of members in the fund for the 3 year period	Previous total salaries (R)	Current total salaries (R)	Average liability at per member current valuation
21 - 29	5 000	76 200 000	98 700 000	45 000
30 - 39	7 600	93 200 000	134 500 000	80 000
40 +	9 000	110 800 000	135 600 000	138 000

i) Comment on the appropriateness of the salary increase assumptions used, given the information provided. (13)

ii) What additional information would you request to assess whether the assumptions need to be changed or not? (2)

[15 Marks]

Question 6

i) Explain the key features of three different approaches to setting the discount rate to be used in an actuarial funding valuation. (7)

ii) What other factors need to be considered when determining the assumptions to use for a valuation? (8)

[15 Marks]

Question 7

A large defined contribution fund provides for death benefits in service before normal retirement age. The benefit is 3 times the annual salary of the deceased member. The benefit is currently insured, with the cost of the insurance and other expenses being deducted from the employer's contribution rate, before the balance of the contribution is allocated towards retirement.

The insurer has completed its annual review of the cost of insuring this benefit. As a result of the poor claims experience of the fund, the cost of the insurance has increased to a unit price of 86 cents per R1 000 sum assured.

i) What are the reasons why this fund may have insured this benefit? (2)

ii) What is the potential impact of the increased cost of the insurance? (2)

iii) What can the fund do to reduce the impact of the increasing cost of death benefit insurance? (2)

[6 Marks]

END OF PAPER