EXAMINATION

10 June 2013 (am)

Subject F104 — *Pensions and Other Benefits*
Fellowship Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Use the instructions and password provided at the examination center to log in.*

2. *Submit your answers in Word format only using the template provided.*

3. *Save your work regularly throughout the examination on the supplied computers' hard drive.*

4. *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.

5. *You must not start typing your answers until instructed to do so by the supervisor.*

6. *Mark allocations are shown in brackets on exam papers.*

7. *Attempt all eight (8) questions, beginning your answer to each question on a new page.*

8. *Candidates should show calculations where this is appropriate.*

Note: The Actuarial Society of South Africa will not be held responsible for loss of data where candidates have not followed instructions as set out above.

AT THE END OF THE EXAMINATION

Save your answers on the hard drive AND hand in 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

QUESTION 1

Set out the points usually given for and against funding for Social Security pension benefits.

[6]
[Total 6]

QUESTION 2

Say that a population size at time t is represented by P(t).

i. Give examples of where a government may need to estimate P(t) for the whole population or sub-populations.

[4]

ii. Give the names and formulae for two different mathematical models for P(t). Define any terms you use and mention the different characteristics of the two models.

[4]
[Total 8]

QUESTION 3

You are the actuary to a medium-sized defined contribution scheme that offers, amongst others, the following benefits:

- A death-in-service lump sum of twice annual salary
- A death-in-service widows' pension of 50% of annual salary

Members and sponsoring employer both contribute at 7.5% of salaries.

One of the trustees has been asked to review the death-in-service benefit structure and has proposed the following changes:

i. At the beginning of each year, for the death-in-service lump sum benefit, the member can choose as cover an integral multiple of annual salary ranging from 0 to 6 times annual salary.
ii. At the beginning of each year, for the death-in-service widows' pension, the member can choose as cover a percentage of salary, in bands of 10%, ranging from 0% to 100% of annual salary.

You have been asked for comment on this review, including advising how the proposals might be operated in practice and suggesting possible modifications and additions. Set out, with brief elaborations where appropriate, the points you would cover in your reply.

[Total 20]

PLEASE TURN OVER

QUESTION 4

There is a large, mature defined benefit scheme with a stable membership profile. Average age at entry in the future is expected to be 25. Members contribute at 7.5 % of pensionable salaries. A recent actuarial valuation shows (PV=present value; FSI=future salary increases):

	R000's
Actuarial value of assets	63 000
PV accrued benefits for current pensioners	7 500
PV accrued benefits for current deferred pensioners	4 500
PV accrued benefits for all active members allowing for FSI	49 500
PV accrued benefits for all active members based on current salary	20 909
PV all future service benefits for all active members allowing for FSI	33 000
PV all future service benefits for all active members aged 25 allowing for FSI	900
PV next year's accrual of benefits for all active members allowing for FSI	1 350
PV next year's accrual of benefits for all active members based on current salary	570
PV all future employee contributions for active members allowing for FSI	15 750
PV all future member contributions for all active members aged 25 allowing for FSI	600
PV next year's member contributions for all active members	900

The valuation assumes that salaries will increase at 9% per annum.

Calculate (showing your working in each case):

i. Standard Contribution Rates (SCR) for the Attained Age Method (AAM), Entry Age Method (EAM), Current Unit Method (CUM) and Projected Unit Method (PUM).
[5]

ii. The Actuarial Liability (AL) for the AAM, EAM, CUM and PUM
[6]

iii. Surplus/deficit for the AAM, EAM, CUM and PUM
[4]

iv. Modified contribution rate (MCR) assuming any surplus/deficit is spread over the future payroll of current members for the AAM, EAM, CUM, PUM and Aggregate Method (AM)
[6]

[Total 21]

PLEASE TURN OVER

QUESTION 5

You are the actuary to several defined benefit pension schemes. Discuss the factors you would take into account in setting the withdrawal assumptions for an actuarial valuation of one of these schemes.

[15]
[Total 15]

QUESTION 6

You are the actuary to a large, mature defined benefit fund with retirement benefits which include:

- A pension of 2% of final average salary for each year of service in the fund.
- An associated contingent spouses' pension of two thirds of the member's pre-commutation pension (with allowance for increases received)
- An associated children's pension of 10% of the spouse's pension per child up to a maximum of 3 children at a time, payable to age 18 (or up to age 21 for full time study, at the discretion of the trustees). In the case of no spouse's pension being paid, the children's pensions are doubled.
- At retirement the member has the option of commuting up to one third of the pension for cash.
- In all cases, pension increases are discretionary, though the trustees do have a policy of aiming to preserve 75% of the original purchasing power in the long term.

A trustee now suggests that an 'upliftment option' be offered whereby a retiring member may choose to receive the full value of the retirement benefit to do with as he or she wishes, e.g. to purchase an annuity in the market at better terms than effectively offered by the fund. The upliftment amount would be calculated by the actuary at the time of retirement. You have been asked to comment.

Discuss the various points you would make in reply to the trustees and the factors you would take into account in deciding on the terms of the option. Also cover possible restrictions, possible extension to existing pensioners and administrative issues.

[15]
[Total 15]

PLEASE TURN OVER

QUESTION 7

List the things a government could do to encourage and help ensure adequate benefit provision for all of its citizens (briefly give examples where appropriate).

[8]

[Total 8]

QUESTION 8

A new company has recently been established in a developed economy. They propose to start a new defined benefit pension fund for their employees who will begin to accrue benefits from the start date of the new fund. You, an actuary, have been engaged to advise on the process.

i. List the criteria you would use to assess any proposed financing strategy.

[3]

ii. The financial director suggests that the new fund should be invested purely in cash for the first few years until it 'gets on its feet'. His rationale is for the stability and protection of the initial capital at this critical stage of the fund's development and to avoid any liquidity problems in the early stages. He feels it is impractical to consider other asset classes while the accumulated funds are still low. Set out the points you would make in reply.

[4]

[Total 7]

END OF PAPER

