EXAMINATION

13 November 2015 (am)

Subject F104 — *Pension 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. You MAY NOT use any other computer program (e.g. Excel) during the examination.*
3. *Save your work regularly throughout the examination on the supplied computer's 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 list.

QUESTION 1

A defined contribution scheme that has recently undergone a statutory valuation is found to have a surplus which did not exist at the previous valuation date. The trustees of the fund have requested you to perform an independent valuation both to verify the result of this recently conducted valuation, and to determine why the surplus arose. They have provided you with the member credits at the last and current valuations as well as all other necessary data.

You have decided to use a cashflow model to reconcile the member liabilities at the valuation date with those at the previous valuation date and determine what led to the surplus arising.

i. List the cashflows you would model. [4]

ii. Describe your model, indicating clearly how you would verify the valuation result and to analyse the surplus arising. [5]

iii. Outline the factors that the trustees need to consider when determining what to do with the surplus. [4]

[Total 13]

QUESTION 2

Outline the actions trustees of a final salary pension fund can take with respect to contributions and investments if the sponsor is found to be in distress. For each, suggest one reason the action may be impractical. [Total 7]

QUESTION 3

You are the actuary to a hybrid fund. The employer offered a defined benefit fund many years ago, but all these members have transferred to the hybrid fund. For the members that transferred from the defined benefit fund, the hybrid fund gives retirement benefits which are the higher of the benefit the member would have received in their old defined benefit fund and their defined contribution benefit. All other members are part of the defined contribution part of the scheme.

i. Outline the risks to the fund of this arrangement. [6]

The employer wishes to remove this underpin and compensate the affected members by increasing their accumulated credit by the smallest amount which would give the member at least a 97.5% probability of their defined contribution benefit being at least equal to the benefit under the defined benefit fund at normal retirement age.

ii. Explain the model that you would use to calculate the addition required for each member. [8]

[Total 14]

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QUESTION 4

You have been approached by a large publicly-listed company (ABC Limited) that is considering the purchase of XYZ Co, a small company that is not listed on any securities exchange. XYZ Co has a mature final salary pension plan that was closed to new members 10 years ago. ABC Limited would like you to value XYZ Co's pension plan, which is funded in advance by regular contributions.

i. Explain why the use of the attained age funding method may be more appropriate than the projected united method for calculating the funding position of XYZ's pension plan. [4]

ii. Assuming that you will use the attained age funding method and that the member data obtained are complete and accurate, outline the factors that you would take into account when setting your valuation basis. [11]

[Total 15]

QUESTION 5

BITS, a large IT company, which is known for its acquisition of IT departments of various other companies, is in the process of acquiring the IT department of a mining company, MINECOR. The transferring employees of the mining company were members of the MINECOR defined contribution scheme. As a part of the acquisition process these benefits will need to be transferred to the defined contribution scheme that is run by BITS.

i. Explain why and how the defined contribution schemes run by the two employers may differ in terms of benefit design. [8]

ii. Discuss the impact on the insurance premiums for the death and disability benefits of the BITS scheme after the MINECOR members have transferred into the BITS scheme. [3]

[Total 11]

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QUESTION 6

You are the consultant to a retirement scheme that funds fully for a benefit only when the benefit becomes due. When the benefit falls due it is paid as a single lump sum out of company money. A record is kept of the build-up of notional contributions. The benefits provided by the scheme are these notional contributions accumulated at a rate of CPI+5% per annum.

i. Identify the type of financing being used and outline the risks involved in this method from the points of view of the members and the employer. [3]

The employer is considering setting up a separate fund into which future contributions can be deposited and from there invested. The new scheme will operate as a cash-balance scheme and the benefits provided will continue to be contributions increased by CPI+5% p.a. The existing scheme will be closed to new contributions but will remain a going concern.

ii. Discuss the factors that you need to consider when advising on an appropriate investment strategy for the new scheme. [8]

iii. Explain how the use of an asset-liability model may be able to assist in determining an appropriate investment strategy for the new scheme. [4]

[Total 15]

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QUESTION 7

In a certain country, the State offers two benefits to its citizens. The first is an old age income benefit paid to individuals over a particular age. The second is a childcare income benefit paid to caregivers of children under a certain age. Both benefits are subject to an income means-test. The benefits are currently financed on a pay-as-you-go basis from general tax revenue. It has been suggested that these benefits should be doubled.

i. What are the implications for contributions to occupational and individual retirement funding arrangements? Your answer should address, among other factors:
- the likely impact on fertility rates;
- the various ways that the benefits could be financed; and
- the impact on the means-test. [7]

ii. What are the arguments for and against removing the means-test on these benefits? [3]

iii. The projected total fertility rate for women born in 1975 (and hence currently aged 40) is 2.50. The observed fertility rates (expressed as live births per 1 000 women per year) for this group are as follows:

Age group	Under 20	20-24	25-29	30-34	35-39	40-44
Fertility rate	73.2	100.6	104.8	80.2	60.6	48.4

You can assume that childbearing is limited to between the ages of 15 and 49.
Calculate the age specific fertility rate for the age group 45-49.

[4]
[Total 14]

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QUESTION 8

You are completing the statutory valuation for a large employer sponsored defined benefit balance-of-cost fund as at the fund's year end date in 2013. The economic assumptions at the current and previous statutory valuation dates are as provided in the table below (you may assume that the demographic assumptions remained static over the valuation period):

Economic assumption	***2010***	***2013***
Pre-retirement discount rate	9.90% pa	8.78% pa
Post-retirement discount rate	4.25% pa	3.05% pa
Inflation	7.43% pa	6.62% pa
Salary inflation	8.43% pa	7.62% pa

i. By considering each economic assumption separately, explain the impact of changing that assumption both on the liability and on other assumptions. [4]

ii. Immediately after the 2013 statutory valuation was completed, the pensioner liabilities were outsourced by purchasing annuities from a life insurer in the name of each pensioner. This resulted in a strain on the fund. List four possible reasons why this strain might have arisen when the pensioner liability was outsourced. [2]

After the pensioner liability outsource has been completed, the company guarantees future retirements will receive similar treatment. Retiring members will be required to use the capital value of their pension to purchase an annuity from a registered insurer of their choice. The capital value provided at retirement will be equal to the actuarial reserve value of the fund pension, as determined in the rules, as quoted by the insurer to whom the pensioner liabilities were outsourced.

iii. Outline the positive and negative implications of this arrangement for the employer and members. [5]

[Total 11]

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END OF PAPER

