INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

23rd November 2012

Subject ST4 — Pensions and Other Employee Benefits

Time allowed: Three hours (14.45* – 18.00 Hrs)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATES

1. Please read the instructions on the front page of answer booklet and instructions to examinees sent along with hall ticket carefully and follow without exception
2. Attempt all questions, beginning your answer to each question on a separate sheet.
3. 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 3 hours to complete the
4. You must not start writing your answers until instructed to do so by the Supervisor.
5. Mark allocations are shown in brackets.
6. Please check if you have received complete Question Paper and no page is missing. If so kindly get new set of Question Paper from the Invigilator

AT THE END OF THE EXAMINATION

Please return your answer book and this question paper to the supervisor separately.

Q.1) List the stakeholders of a large defined benefit pension scheme and state their objectives. **[7]**

Q.2) You are the actuary of a large defined benefit pension scheme. Due to the increasing cost of providing the scheme's benefits, the board of company decides to close the scheme for all future accrual for existing member as well as entrance of new members and plans to open a new defined contribution plan. As an actuary you are envisaging various risks. Discuss all the risks (both related to DB and DC) involved to the company. **[6]**

Q.3) Outline the approaches a scheme's trustees can use in order to monitor the strength of the sponsor covenant and describe the actions the trustees are likely to be able to take if the sponsor is in distress. **[4]**

Q.4) You are senior actuary of a mature defined benefit pension scheme. The trustee of the scheme has asked you to explain the various funding methods.

[i] Explain the difference between the prospective and accrued method of funding. Set out the simple formulae that would be used to calculate the Actuarial liability (AL) and Standard Contribution Rates (SCR) for the four main funding methods. (6)

[ii] Arrange in increasing order the SCR and AL for the four funding methods for a large and mature scheme. You should define any further assumption you make. (3)

The scheme provides a full range of benefits to 300 employees. You have just completed the scheme valuation using the Attained Age Method. The cost of the death-in-service benefits comes out to be 1.35% of salary. The Finance Director has written to you to ask you to explain the discrepancy between this figure and the cost of insuring the benefits of 0.8% of salary.

[iii] Discuss possible reasons for the difference between the two figures. (6)

[iv] Describe and discuss two other common ways in which the cost of death-in service benefits might be costed for the purposes of the valuation. (6) **[21]**

Q.5) After having seen a recent case of cancer of a well-known player, the Sports minister of a developing country has asked you to advise on the establishment of an industry wide healthcare scheme for players, coaches and managers.

[i] List the benefits that such a scheme might offer. (4)

[ii] Set out the particular characteristics of the potential membership, and how these might impact on the design of the scheme. (8)

[12]

Q.6) You provide actuarial services to a small company in a particular country which has a funded defined benefit scheme for its 100 employees. You have recently completed a valuation of this scheme.

You have now been asked to carry out a valuation of the country's unfunded defined benefit state sponsored scheme. The scheme covers approximately 5,000,000 workers and their dependants representing most of the working population of the country.

[i] Describe the key differences between the risks faced by the sponsor of each scheme and explain how these risks might be mitigated. (5)

[ii] Describe the differences between the two valuations considering the following areas

- Data
- Actuarial assumptions
- Funding objectives (12)

[iii] The state is considering moving to a funded approach to finance all social security benefits. Describe the four main methods of financing social security schemes. (6) **[23]**

Q.7) Pension arrangements in a developing country consist of individual money purchase funds which citizens build up over their working lifetime. At age 60 all benefits must be taken in pension form. The individual can choose either to purchase an annuity with an insurance company or to draw an income from their fund until they reach age 75 and then purchase an annuity.

Annuities may include a spouse’s pension of up to 100% of the individual’s pension payable on death. The individual may choose either a pension which increases in line with prices inflation, or does not increase in payment.

For individuals who do not choose to buy an annuity at age 60 the minimum and maximum income which can be drawn from their fund, up to age 75, should be certified every three years, by an actuary. The minimum and maximum pensions must in the actuary’s opinion, be sustainable. Sustainable, in this situation, means that on the assumptions adopted the pension is equivalent in value to the fund value and is payable for life.

[i] Outline, with reasons, the assumptions that an actuary would need to make to calculate the minimum and maximum pensions which you are prepared to certify that individuals can draw from their fund. Individual assumption values are not required. (4)

[ii] State with reasons the further information required and the points to consider in order to advise an individual as to whether they should draw their benefits from the fund or purchase an annuity when they reach age 60. (4)

[iii] Set out the formualae for the minimum and maximum pensions which the actuary would certify for a male retiring at age 60 with a current fund value of INR 200,000. You should state any specific assumptions required. (4)

[iv] Describe lifestyle switching. (3) **[15]**

Q.8) A company is about to set up under trust, a money purchase pension scheme for its employees. The company is considering having a defined benefit underpin based on $1/60^{th}$ of final pensionable salary for each year of membership, with the larger of the underpin pension and the pension available from money purchase fund being payable on retirement, or earlier leaving or death.

[i] The money purchase scheme will offer a wide range of investment funds for its members. Discuss the investment implications of the defined benefits underpin. (4)

[ii] Outline the alternative ways in which the company could meet the cost of the underpin (2)

[iii] Discuss how stochastic techniques may be used if the company wished to fund the cost of the underpin. (6) **[12]**

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