

INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

22nd May 2009

Subject ST4 — Pension and Other Employee Benefits

Time allowed: Three hours (14.15* – 17.30 Hours)

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. ** 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 answer sheet until instructed to do so by the supervisor*
4. *The answers are not expected to be any country or jurisdiction specific. However, if Examples/illustrations are required for any answer, the country or jurisdiction from which they are drawn should be mentioned.*
5. *Attempt all questions, beginning your answer to each question on a separate sheet.*
6. *Mark allocations are shown in brackets.*

AT THE END OF THE EXAMINATION

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

- Q 1)** A company which currently provides no form of pension to any of its employees is thinking of setting up a new defined contribution pension scheme.
- State four different types of eligibility criteria the company may incorporate into the design of the new scheme giving reasons why each one might be appropriate. [5]
- Q 2)** (i) Define the term Total Fertility Rate and explain the difference between rates calculated on a cohort basis and a period basis. (3)
- (ii) In the context of population projections, give a reason why each basis might be preferable. (2)
- (iii) Outline the shortcomings of the use of simple mathematical models in practice. (3)
- [8]
- Q 3)** A company has approached you as actuary to help them design an overall benefits package for employees' long term retirement benefits. The workforce comprises of a range of different job profiles and income levels.
- (i) Describe what is meant by a Net Replacement Ratio. (1)
- (ii) What factors contribute to the required level of ratio for an individual. (5)
- (iii) State the limitations of using a Net replacement ratio on its own to set a retirement benefit target. (4)
- [10]
- Q 4)** You are the Actuary to a Civil Servants' Pension Scheme (CSPS), which is a defined benefit scheme run by the Government of a developing country. The scheme runs on the basis of Pay-as-you-go (PAYG) system. The Government has indicated that they intend to set up a defined contribution (DC) section for all employees who join on or after 1 January 2010 (existing active members at that date will continue to accrue benefits in the defined benefit section).
- (i) Set out the issues faced by the State in continuing the defined benefit scheme. (5)
- (ii) Outline the attractions of this proposed arrangement to the State, compared to leaving the scheme in its current form. (3)
- (iii) Outline the risks associated with the DC scheme. (3)
- [11]
- Q 5)** The regulator of a country wants to promote the sound financial management of pension schemes. In a recent seminar, as an independent pension consultant, you have given a presentation on stochastic asset liability modelling. Impressed by the presentation, the regulator has asked you to produce a detailed report covering the following issues:
- (i) The different uses of stochastic asset liability modelling for pension schemes.
- (ii) The key steps in conducting such an exercise to set appropriate investment strategy keeping in mind the long-term solvency of a pension scheme.
- Discuss the points that you will include in your report. [13]

- Q 6)** You are the actuary to a long established final salary pension scheme. At retirement the pension scheme gives the members a cash commutation option.
- (i)** Explain what is meant by a cash commutation option. (2)
 - (ii)** Outline how the conversion rate is calculated and set out the considerations in setting this rate. (10)
 - (iii)**List what other member options the scheme may have in its operation. (4)
- [16]**
- Q 7)** A large defined benefit pension scheme, which is currently under-funded is about to undertake a valuation to determine the scheme's liabilities and to decide on the employer contributions to be paid for the next three years.
- (i)** Discuss why it is important for the trustees to understand the future support that the employer will provide and its ability to provide the promised support. (8)
 - (ii)** State five methods by which the Trustees could assess the sponsor's covenant, giving an advantage and disadvantage of each method. (10)
- [18]**
- Q 8)** A large mining company provides its retirees access to medical facilities that are run by the company itself. Both hospitalization and medicines are provided to the retiree and their spouse for each of their lifetime. Accounting standards for the country require that an actuarial valuation is conducted for all long term benefits provided to staff and retirees. The client has asked you for your advice on conducting the valuation for the year ending 31 March 2009.
- (i)** List the demographic assumptions you will need for this valuation. (4)
 - (ii)** Describe how the demographic assumptions might be set. (4)
 - (iii)**List the economic assumptions you will require for this valuation. (2)
 - (iv)**State what information will be considered when choosing the economic assumptions. (5)
 - (v)** Explain the relationship between the economic assumptions and the impact they have on the valuation. (2)
 - (vi)**Explain the key differences between this valuation for accounting purposes and a valuation one may do for funding purposes. (2)
- [19]**
