

# Actuarial Society of India

## EXAMINATIONS

19<sup>th</sup> May 2006

Subject ST4 – Pensions and Other Employee Benefits

Time allowed: Three Hours (02.15\* - 05.30 pm)

### *INSTRUCTIONS TO THE CANDIDATE*

- 1. 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.*
- 2. You must not start writing your answers until instructed to do so by the supervisor.*
- 3. 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.*
- 4. Mark allocations are shown in brackets.*
- 5. Attempt all questions, beginning your answer to each question on a separate sheet.*
- 6. Fasten your answer sheets together in numerical order of questions. This, you may complete immediately after expiry of the examination time.*

### **Professional Conduct:**

*It is brought to your notice that in accordance with provisions contained in the Professional Conduct Standards, If any candidate is found copying or involved in any other form of malpractice, during or in connection with the examination, disciplinary action will be taken against the candidate which may include expulsion or suspension from the membership of ASI.*

**Candidates are advised that a reasonable standard of handwriting legibility is expected by the examiners and that candidates may be penalized if undue effort is required by the examiners to interpret scripts.**

***AT THE END OF THE EXAMINATION***

***Hand in BOTH your answer script and this question paper to the supervisor.***

- 1) **List**, from the employers' point of view, the advantages and disadvantages of:
- a) The purchase of non profit immediate annuities as assets for a medium sized self administered pension scheme. (4)
  - b) Property investment for a large defined benefits pension scheme which is closed to new entrants. (6)
- [Total 10]**
- 2) Mr X resides in a developing country, which has seen rapid economic growth over the last decade. He is 50 years old, unmarried and is employed as a middle manager in the financial services sector. He plans to retire at age 60 and has been contributing into a personal pension scheme, run by a private insurance company, for the last 15 years.
- The pension scheme is a flexible plan where every month a minimum premium is payable but a top-up is allowed any time. Accordingly, 10 years back, Mr X has invested a large transfer value from his previous employment. Investors are also allowed to invest in one of the three funds managed by the company – Bond Fund, Balanced Fund and Equity Fund. Switching between funds is allowed once a policy year free of cost. Looking at the booming economy, Mr X has always invested in the Growth Fund.
- At retirement, Mr X wants to receive the maximum allowed lump sum and use the balance to purchase an annuity so that he receives a pension of 60% of his salary at retirement. He wants his pension to increase in line with the increase in Retail Price Index. He does not want to make provisions for any dependants after his death.
- You are personal pensions consultant and Mr X has approached you to review the level of his regular contribution to the personal pension scheme. He also wants you to give him an indication of the probability of achieving his stated aim. In order to give your advice;
- a) **List** the information and data that you would need to frame your advice. (5)
  - b) **List** the calculation assumptions you would need to make and describe how you would select them. (10)
  - c) **Describe** how you would help Mr Singh assess the likelihood that he will be able to retire with his desired level of benefits. (5)
- [Total 20]**
- 3) A large industrial company runs a defined benefit pension scheme providing a typical range of pension and death benefits based on final salary and years of service.
- The management of the company is concerned about the volatility of the contribution requirement which might change as a result of events beyond their control. The company is considering a change to a money purchase scheme for future employees only. The Finance Director has written to you for your advice on this matter and among other things he has written:
- “I understand that for a money purchase scheme, it is possible to calculate a contribution rate at the point of entry to the scheme for each member, which will be sufficient to replicate the pension benefits provided under the current scheme, while the cost to the company will be fixed.”*
- Discuss** the issues that you would include in your report. **[Total 10]**

- 4) The government of a developing country wishes to encourage private sector provision of pension benefits through employer/employee participation. Currently, there are no special tax incentives to the employers and employees relating to such pension benefits. However, the government is considering changing the tax laws in such a way that it achieves its objective of encouraging private pension provision which will also be consistent with the other aims of a developing country's government. In particular,
- to encourage investment within the country and primarily in government bonds;
  - to minimise the loss of tax revenue when the new system is introduced, by avoiding giving the tax benefits to the highly paid;
  - to ensure that pension money is focused on providing benefits into old age;
  - to enable adequate income for those who become disabled before retirement.

**List and discuss** the points that you will set out in your report. **[Total 10]**

- 5) In the context of a State wanting to set up a social security scheme for the population, answer the following;
- a) For earnings related contributions and benefits, discuss issues relating to earnings threshold and earnings ceiling. (6)
  - b) List the advantages and disadvantages to the State of offering a defined contribution scheme rather than a defined benefit scheme. (4)

**[Total 10]**

- 6) You have been retained to advise a Government on various aspects of population projection. In this context answer the following;
- a) Various uses by the State to which population projection can be put and the factors that need to be considered for the projection. (5)
  - b) Discuss various ways in which fertility rates can be defined and methods by which it could be calculated. (7)

**[Total 12]**

- 7) In the context of actuarial valuation of an employer sponsored retirement benefit scheme;
- a) List the assumptions that may be required (6)
  - b) As against using general population statistics for assumptions relating to proportion of members married and the average age of spouses, suggest scenarios where it may be more appropriate to use the members' individual circumstances. (6)

**[Total 12]**

- 8) For valuation of a defined benefit retirement scheme;
- a) Describe a generalised model for Projected Benefit Outgo and list the particular circumstances for which it could be adapted. (8)
  - b) Describe a generalised model formula assuming emerging cash-flow approach (8)

**[Total 16]**

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