# INSTITUTE OF ACTUARIES OF INDIA

## EXAMINATIONS

**14th May 2010**

**Subject ST4 — Pension 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. ** 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 |
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| **Please return your answer book and this question paper to the supervisor separately.** |

**Q. 1)** Define the following terms:

a) Defined Accrued Benefit method
b) Lifestyling asset allocation
c) Commutation
d) Waiting Period
e) Free Cover

**[5]**

**Q. 2)** The head of HR is thinking of introducing a long term employee benefit. List the separate objectives from an employer and an employee perspective that he should consider.

**[5]**

**Q. 3)** **(i)** List the advantages and disadvantages of a pension scheme buying annuities when pensions come into payment compared with paying them direct from the scheme's resources. (5)

**(ii)** Explain how a scheme's investment policy might be constrained by the need to purchase insurance company annuities on retirement. (3)

**[8]**

**Q. 4)** You are the advising actuary to a medium-sized defined benefit pension scheme. The finance director of the sponsoring company has heard about the possibility of using asset-liability models to set a pension scheme's investment strategy. He has asked you to provide him with further information.

Discuss the uses to which asset-liability models can be put and the limitations of their use.

**[10]**

**Q. 5)** A large company in India operates an established funded final salary pension scheme. The scheme is contributory and the assets are directly invested.

A regular actuarial valuation of the scheme was carried out as at 31 December 2009 and showed a considerable improvement in its ongoing finances. The ongoing valuation basis includes an assumed rate of investment return of 7% per annum and salary growth of 4% per annum.

The figures below have been drawn from the 2006 and 2009 valuation reports with amounts have been given in Rupees million.

| | 2006 | 2009 |
|---|---|---|
| Number of active members | 3000 | 2800 |
| Annual pensionable payroll | 540 | 544 |
| Market Value of Assets | 1350 | 1750 |
| Value of Past Service Liabilities | 1350 | 1680 |

During the inter-valuation period the contributions paid were Rs. 50 million per annum and the benefits payout were Rs. 35 million per annum

**(i)** List all the sources of surplus which are likely to be considered when carrying out an analysis of surplus for a pension scheme such as this. (5)

**(ii)** Estimate the investment return achieved and the surplus arising from investment experience and comment on your results (6)

**(iii)** Comment on the contribution to the analysis from salary increases (2)

**[13]**

**Q. 6)** A developing country is reforming its pension system and is considering its options. No formal social security provision currently exists but Government employees have enjoyed membership of a defined benefit pension plan.

**(i)** List the relevant stakeholders that would be affected by any pension reform. (4)

Costs for the Government employees scheme have been steadily rising over the last 20 years. Currently the pension is paid from general government revenues.

**(ii)** List the things the Government may be able to do to stop this problem getting worse. (5)

The Government decides to roll out a new voluntary defined contribution based pension scheme for all citizens.

**(iii)** Outline the areas which the Government will have to address in the design of this new scheme. (6)

**(iv)** Describe some of the challenges the Government will have in making the new scheme successful. (3)

**[18]**

**Q. 7)** You are an actuary advising the company on their annual financial reporting of an open defined benefit pension scheme. On receiving your report the CFO, who has recently been appointed, calls you to discuss the contributions to be paid given the deficit position disclosed by your report. He asks you to confirm that he should transfer the amount of the deficit to the Trust and to confirm that no further contribution need be made in the future.

As you believe that more explanation is required the CFO asks you to set out your thoughts in a letter.

Set out the points you would cover in that letter which should include the following items:

**a)** The purposes of the valuation you have provided and how these compares with other types of valuations. (10)

**b)** The issues that the CFO should consider in deciding how much to contribute (6)

**c)** A response to his question relating to the need for further contributions. (4)

**[20]**

**Q. 8)** You have been asked to advise a company about the cost of a new retirement benefit scheme for its employees. The benefits which the scheme is to provide are as follows:

**a)** On retirement at normal retirement age, a lump sum calculated as 1/40th of the final year's salary for each year of service with the company,

**b)** On leaving service before normal retirement age a preserved lump sum benefit payable on normal retirement age, calculated as in (a)

**c)** On death in service, a lump sum equal to 1.5 times salary at the date of death

The salary defined here is the basic salary.

You have made calculations on a basis which includes projection of salary increases to retirement or earlier exit and the following total values have been obtained, where summation is over the whole membership and duration is the period of prior service which will be pensionable.

Present value of future service benefit of 1* Salary on retirement or withdrawal = Rs. 448.5 million

Present value of future service benefit of 1* Salary on retirement or withdrawal accruing this year = Rs. 22.4 million

Present value of future service benefit of 1* Salary on retirement or withdrawal for all in service members aged 30 = Rs. 319.5 million

Present value of future death benefit of 1* Salary = Rs. 3.85 million

Present value of future death benefit of 1* Salary for all in service members aged 30 = Rs. 2.75 million

Present value of death benefit of 1* Salary over next year = Rs. 0.14 million

Present value of salaries up to exit = Rs. 640.50 million

Present value of salaries up to exit for all in service members aged 30 = Rs. 465.95 million

Total Current annual salaries = Rs. 35 million

**(i)** Describe three methods of calculating a regular contribution rate for future accruals of benefit under the scheme and make the necessary calculations using the information provided. (12)

**(ii)** Comment on the suitability of each method for funding purposes including the effect of possible changes in the average age of the membership. (9)

**[21]**

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