

Actuarial Society of India

EXAMINATIONS

17th June 2005

Subject ST4 – Pensions and Other Employee Benefits

Time allowed: Three Hours (2.15* - 5.30 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.”

AT THE END OF THE EXAMINATION

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

Q.1 Describe the scaled premium method and comment on its advantages and disadvantages as a method of financing a social security scheme. **[6]**

Q.2 In a country, all companies are required to set up a defined benefit scheme for their employees. At the end of every financial year, the companies are required to value the pension fund liabilities using Projected Unit method. Regulations require that adequate assets are set aside to meet the liabilities as determined by the annual valuation.

As a measure of additional security to the members of the pension schemes, the government is proposing to introduce an additional regulation, which will require the value of assets of the pension funds to exceed the amount of the liabilities atleast by 5% of the latter.

List the merits and demerits of the government proposal. **[5]**

Q.3 A company runs a defined benefit scheme. Assets and liabilities are valued using the discounted cash flow method. The company has set objectives to maximise the returns on the assets of the pension fund subject to the following criteria:

- The value of the scheme assets to be at least 5% more than the amount of the liabilities at all times.
- The contribution rate over the future years should not increase by more than 1% over any 5-year period.

Describe how asset-liability modelling techniques can be used to set an appropriate investment strategy so that the company objectives are met. **[9]**

Q.4 An employer, who has previously made no pensions provision, has decided to set up a Defined Contribution pension scheme for its employees. There will be a number of funds available for investing the contributions and the member can choose between the funds. The accumulated funds at retirement will be used to buy annuities from a pension provider.

(i) Discuss the factors to consider while setting the appropriate contribution rates payable by both the employer and the employees to the new scheme. **(8)**

(ii) Comment on the main economic assumptions to be considered in determining the contribution rates. **(7)**

(iii) Describe the issues to consider while determining the types of investments to be offered to the members. **(11)**

(iv) List the information which should be disclosed to members at the launch of the pension scheme and at regular intervals. **(5)**

[Total 31]

Q.5 In a country, there are a growing number of disputes regarding the ownership of pension benefits on divorce. To avoid any ambiguity, the government wants to introduce a new legislation to specify how the pension should be split between the couple on divorce. The government has proposed that the transfer value of the benefits accrued during the marriage be calculated. This transfer value is then split

between the couple by the courts in the same proportion as the split of the couple's other assets.

- (i) List all criteria that ideally any new legislation should meet. (3)
- (ii) Discuss the advantages and disadvantages of the government's proposed method for splitting pension benefits from the viewpoint of the ex-spouse. (6)

[Total 9]

Q.6 A large financial institution runs a non-contributory defined benefit scheme for its employees. On retirement the employees are entitled to a pension of $1/60^{\text{th}}$ of final salary for each year of service payable for life. The pension in payment is increased in line with price inflation.

- (i) The institution is currently contemplating various cost-cutting measures. The cost of providing pension to employees has also come under review.

List the ways in which the company can modify their existing pension scheme to reduce the cost to the company. (10)

- (ii) The company has decided that it will close the defined benefit scheme to new recruits. For the new recruits, it is planning to introduce a defined contribution scheme, where the employees will have to contribute 5% of their salary and the company will contribute an equal amount. On retirement, the accumulated fund will be used to buy an annuity from a pension provider.

For existing members, past accruals of pension are preserved. However for future accruals an existing member will have to choose one of the following three options:

- The employee can stay with the defined benefit scheme and retain an accrual rate of $1/60^{\text{th}}$ for future service by making a contribution 5% of future salary.
- The employee can stay with the defined benefit scheme and choose not to contribute, in which case, the accrual rate for future service will be reduced to $1/80^{\text{th}}$.
- The employee can leave the defined benefit scheme and join the defined contribution scheme, where they will be subject to the same rules as the new recruits.

Discuss the various issues that the **existing members** should consider before making the choice. (10)

[Total 20]

Q.7 A company runs a defined benefit pension scheme. On retirement, the benefit to the employees include the following:

- A lump sum of $3/100^{\text{th}}$ of final salary for each year of service.
- A pension of $1/100^{\text{th}}$ of final salary for each year of service payable for life and a contingent spouse's pension of 50% of the member's pension. The pension increases in line with increases in the retail price index.

On leaving service before retirement, the members are entitled to a deferred pension which receives increases of 5% or price inflation if less.

Currently there are 500 active members. There are also 2,000 former employees entitled to deferred benefits and 25 former employees with pensions currently in payment.

The company is about to carry out a valuation for the purpose of assessing the ongoing funding position and determining the contribution rate. Assets and liabilities are to be valued using the discounted cashflow method. You are an actuary and the company has appointed you to carry out the exercise.

- (i) List the demographic assumptions you will need to make. (5)
- (ii) Discuss how you would choose the demographic assumptions. (6)
- (iii) List the economic assumptions you will need to make and explain the inter-relationship between them. (6)
- (iv) List the information you will need to support the economic assumptions you choose. (3)

[Total 20]
