Actuarial Society of India

EXAMINATION

18th May 2007

Subject ST4 — Pensions and Other Employee Benefits

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

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer sheet.*
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. *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. *You must not start writing your answers in the answer sheet until instructed to do so by the supervisor.*
5. *Mark allocations are shown in brackets.*
6. *Attempt all questions, beginning your answer to each question on a separate sheet.*
7. *Candidates should show calculations where this is appropriate.*
8. *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

Please return your answersheets and this question paper to the supervisor seperatly.

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator.

Q. 1 The retirement provisions of a country are primarily provided by employer sponsored defined benefit pension schemes. Regulations are in place to ensure that each defined scheme is funded and trustees are appointed to monitor the well-being of the scheme. To strengthen the role of the trustees the regulator is considering introducing a new set of regulations which include the following: *"Trustees should form an objective assessment of the sponsor's covenant."*

a) **Define** the term "sponsor's covenant". (1)

b) **Outline** the broad issues regarding the sponsor and the business environment that should be taken into account by the trustees while forming their opinion on "sponsor's covenant". (5)

c) **List** the circumstances under which "sponsor's covenant" need not be considered. (2)

d) **Discuss** the advantages and disadvantages of introducing a new regulation on the requirement to assess "sponsor's covenant". (2)

[10]

Q.2 In a developing country, currently the defined benefit occupational pension schemes offer a number of options to the scheme members. A large multinational company has recently started its operation in the country and is planning to set up an occupational pension scheme for its employees. The company is considering a list of options to incorporate in its pension scheme.

a) **List** the options which are generally available to occupational pension scheme members. (4)

b) **Outline** the factors that should be taken into account while setting the terms of any option. (6)

c) In particular for cash commutation of pension, the company is planning to use a variable interest rate instead of a fixed interest rate to calculate the lump-sum payment. **Discuss** the merits and de-merits of the proposed approach. (5)

[15]

Q.3 A medium-sized manufacturing company had set up a non-contributory final salary pension scheme for its employees 3 years ago. The pension scheme is primarily designed to provide pensions at retirement for its members. Benefits also include a lump sum death benefit on death in service. When the scheme was set up members were not given any entitlement to benefits in respect of service prior to that date.

Regulatory rules require that valuation of the scheme is carried out once in three years. Accordingly, the scheme actuary has recently carried out the second valuation of the scheme. The assumptions used for the current valuation were exactly the same as that used in the previous valuation. The results of the current valuation indicate that there is a small surplus of assets over the actuarial liabilities.

Over the entire duration of the existence of the scheme, the company has contributed in line with the Standard Contribution Rate.

a) **Define** the Standard Contribution Rate for each of the following valuation methods:
(i) Attained Age Method
(ii) Entry Age Method. (2)

b) For each of the methods set out above, **explain** how the Standard Contribution Rate and the Modified Contribution Rate would have been expected to move in comparison with the initial rates, if the experience in the inter-valuation period turned out to be in line with the valuation assumptions and the same method was used at both valuation. (4)

c) If both valuations were carried out using Attained Age Method, **list** the principal sources of surplus and **discuss**, for each source, how the actual experience could have given rise to the surplus. (5)

d) The Finance Director of the company has suggested that the Current Unit method be used to fund the scheme as this would result in the lowest contribution requirement for the company. **Outline** the issues that should be considered before this suggestion is implemented. (4)

[15]

Q.4 The Government of a developed country provides two tiers of State pension. The primary tier is a flat rate of pension, also called Basic State Pension (BSP), available to every citizen above the State Retirement Age (SRA) of 60. The second tier is a means-tested benefit, also called the Minimum Income Guarantee (MIG), and is targeted to the most needy above the SRA.

The current average earning per annum is 500. The BSP is set at a level of 50 and MIG makes additional payment, if required, to ensure that each individual above SRA is entitled to a total annual income of 100. The BSP and MIG are linked to the price inflation which is currently at 5% while the earnings inflation is also at 5%.

Consider two individuals A and B both currently aged 20 and recently been employed. The annual salary of A is 1,000 while that of B is 250. Both make additional contributions of 5% of their salary to private pension arrangements which provide investment return of 5% per annum. At retirement the accumulated fund will be converted to an annuity increasing in line with price inflation.

a) **List** the advantages and disadvantages of means-tested benefits. (4)

b) Assuming that on average 20 year olds in the country lives up to an age of 80, **calculate** the amount of retirement income for both these individuals at SRA, showing the split between BSP, MIG and the private pension arrangement. Indicate any assumptions you make. (5)

c) **Comment** on your findings in part (b). (1)

[10]

Q.5

a) Define the following terms in the context of arriving at actuarial liability of a Defined Benefit Pension scheme;

i) Current Unit Method (1)

ii) Projected Unit Method (1)

iii) Defined accrued Benefit Method (3)

b) Define the following in the context of a Pension Scheme;

i) Control Period. (1)

ii) Actuarial Surplus (1)

iii) Vested Rights (1)

iv) Valuation rate of interest (2)

v) Terminal Funding (1)

vi) Replacement rate (1)

vii) Pension Equity Scheme (2)

[14]

Q.6 In the context of financing employee benefits, answer the following;

i.) The advantages of Pay-as-you-go (PAYG) approach (2)

ii.) The concept of smoothed PAYG and they it can operate (3)

iii.) Book reserving including issues relating to security of benefits, from members' perspective and the manner in which "Third Party Guarantees" can operate to enhance the security for the members. (8)

[13]

Q.7 In the context of Risk Management of a Pension Scheme, answer the following;

a) Suggest actions that could be taken when setting the Investment strategy to mitigate the investment risks of running the pension scheme. (2)

b) The factors that affect the risk profile of a pension scheme. (3)

c) You are the new benefit manager of the company having the Pension scheme which has generous non-contributory final salary scheme. Staff representatives have made it clear that employees are unhappy that there is a deduction of a proportion of the basic State pension from their scheme pension.. How might you address the problem without changing the benefits? (4)

d) How would you assess the additional risk for the pension scheme if it provided a defined benefit promise with a defined contribution underpin? (3)

[12]

Q.8 You are Actuary and Investment Advisor to an Employee pension scheme. Within the framework of your role answer the following;

a) One of the Scheme Trustee has commented that government fixed-interest bonds are the best investment for a final salary pension scheme because they are secure. Comment on this statement. (2)

b) Discuss the factors that you would consider in determining an appropriate investment strategy, if the scheme were defined benefit with defined contribution underpin. (3)

c) What are the main advantages of fixed-interest government bonds? (2)

d) What conditions need to be fulfilled to realise the quoted returns from indexed-linked bonds? (1)

e) What are the main advantages of domestic-fixed interest corporate bonds over government bonds? What additional risks are introduced? (3)

[11]

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