INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

15th November 2011

Subject ST4 — Pensions 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.*

7. *Please check if you have received complete Question Paper and no page is missing. If so, kindly get new set of Question Paper from the Invigilator.*

AT THE END OF THE EXAMINATION
Please return your answer book and this question paper to the supervisor separately.

Q. 1) A large telecom company operating in the country for about four decades wishes to introduce a retirement benefit scheme for its employees. The sector has become very competitive, but the company has performed well in the recent years and has expanded to various geographies to meet the increased demand. The company also has a subsidiary employing contract as well as regular employees. The company has approached you for an initial analysis for finalizing the benefit scheme design.

Set out the questions that you would ask the company before commencing your initial analysis for the benefit scheme design.

[6]

Q. 2) **i)** Describe the main features of defined benefit social security provision. (6)

ii) Outline the risks to a State offering a defined benefit scheme. (3)

[9]

Q. 3) Legislation concerning defined benefit pension schemes requires annual actuarial valuations to be made, comparing the market value of assets with the value of past service liabilities on the basis of specified assumptions. In particular the specified discount rate varies according to the market yield on government bonds, all other assumptions are fixed.

The rules for setting employer contributions to such schemes are set as below:

- If the past service funding level disclosed by the valuation is between 80% and 120% then the employer is free to decide how much, if anything, it will contribute in the following year.
- If the past service funding level is lower than 80% then the employer must pay special contributions to restore the funding level to 80% immediately.
- If the funding level exceeds 120% then the employer may not pay any contributions in the following year and the scheme's investment income over the year is subject to a special tax.

The schemes are permitted by law to invest in either equities or government bonds or a combination of both.

The current funding level of a scheme which is currently invested entirely in equities is 110%.

i) Comment on this investment policy. (4)

ii) Explain the process of using Asset Liability Modelling to investigate the effect of alternative investment strategies. (5)

[9]

Q. 4) Describe the component method of population projection.

[14]

Q. 5) A medium-sized auto manufacturer who has a good covenant offers a final salary pension scheme to its employees. The scheme is well funded and has a practice of providing discretionary pension increases.

i) Explain the factors that should be considered when determining the strength of the company's covenant. (5)

ii) Define the terms valuation advice and funding advice. (1)

iii) Discuss the issues you will take into account in providing valuation and funding advice in the current circumstances. (4)

[10]

Q. 6) **i)** List the different actuarial approaches available for the analysis of a pension scheme. (1)

ii) Identify the appropriate approach to the analysis of a social security pension system and explain the differences in this compared to the approach applied for an occupational pension scheme. (5)

iii) A religious charity in India is examining the possibility of establishing a health care benefit for the senior citizens in the country. One of the Trustees has asked you to build an appropriate model of the finances of the scheme. Outline the points that would be considered before building the model. (7)

[13]

Q. 7) An employer in India provides final salary pension benefits to its employees which are funded. The trustees purchase annuities from life insurers when members retire.

i) List the advantages and disadvantages of purchasing the annuities from life insurers. (6)

ii) In recent years the life insurers have increased annuity rates (annuity per annum payable per Rs.1000/- purchase price) considerably. List the possible reasons for such increases. (3)

iii) The costs under Accounting Standards in the financial statements of employers have in the last few years gone up considerably. On account of this an employer having a defined benefit pension scheme wants to discontinue the current scheme. List the courses open to the employer mentioning the consequences of each of them. (8)

[17]

Q. 8) You are the actuary to a final salary pension scheme and have just completed the valuation as at 1 April 2011. The valuation results were as below:

	(Rs. Millions)
Liabilities	
Value of Total Service Liabilities	240
Value of Past Service Liabilities	135
Assets	
Market Value of Assets	150
Actuarial Value of Assets	120
Contributions	
Value of Total Future Contributions	90

The contributions are based on the Entry Age Method (EAM). The EAM Standard Contribution Rate is 15% of salary based on age 30 at entry. Member contributions are 3% of the salary. The average age of the current membership is 45.

The actuarial value of assets has been calculated by using the target notional portfolio mix of 50% equities and 50% bonds, with the respective market value adjustments being 70% and 90%. The actual split of the assets at the valuation date was 25% equities and 75% bonds.

For previous valuations the method adopted valued the assets at their actuarial value based on the target notional portfolio whilst the liabilities were determined using the EAM method. Any deficit/surplus was then amortised over the average future service of the active membership. The trustees are proposing to continue with this method.

i) Calculate the recommended company contribution rate as at 1 April 2011 if the trustees' proposed methodology is used. (3)

ii) The company has commented that if the market value of assets is compared to the value of past service liabilities, there is an Rs.15 million surplus and therefore the total contribution rate should be reduced from the 15% level. Discuss the company's comments. Your answer should include comments on the suitability of the method and assumptions used. (7)

iii) The scheme also allows members to exchange pension for cash at retirement or to purchase additional pension by augmentation. The member pays income tax on any pension in payment but any amount taken as cash is free of tax. Sample rates for the two options are set out below.

Age	60	65
Commutation Factor	15	12
Augmentation Factor	25	16

Commutation Factor refers to the cash granted for each unit of pension given up. Augmentation Factor refers to the cost of purchasing one unit of pension.

A trustee asks you why the published commutation factors are so much lower than the augmentation factors used for purchasing single-life pensions, and suggests it would be fairer to use the same factors for both calculations.

Discuss the arguments for and against using the same factors for commutation and augmentations, including any other issues that should be considered. (12)

[22]

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