INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

11th May 2015

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 you are required 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) An employer currently provides its workforce with a pension scheme under which the only benefit currently available is a level pension for the member from a specified retirement age. The employer is reviewing the benefit provision and wishes to offer a wider range of benefits, but without altering the cost of the scheme.

i) Outline the different benefit options that could be offered to members. (5)

ii) Discuss the practical issues that might arise, and suggest how these might be addressed. (5)

[10]

Q. 2) A company provides a defined benefit pension scheme for its employees. The actuary has recently presented the results of the valuation to the trustees and the company.

The company is concerned that the cost of the scheme as disclosed in the company's accounts is stabilised as much as possible. The relevant accounting standard values all liabilities by reference to yields available on corporate bonds of appropriate duration. The company's finance director has suggested that the pension scheme's investments be moved wholly into a portfolio of corporate bonds, from the current mix of equities, government bonds and cash.

The recent valuation revealed a surplus on the basis adopted for the ongoing funding of the scheme, but a past service deficit on the basis used for the company's accounts. To assist with the decisions on future investment strategy, it has been agreed that an asset liability modelling exercise be carried out to determine a suitable investment mix.

i) Compare the main characteristics of corporate bonds with the characteristics of the other investments already held by the trustees. (6)

ii) Discuss whether the proposed change in investment strategy is appropriate from the trustees' point of view. (4)

iii) Describe the additional information the actuary will need to perform the asset liability modelling exercise. (4)

iv) List four measures of risk that could be used when setting the objective of the asset liability modelling exercise. (2)

[16]

Q. 3) A management consultant has produced a report on risk management for the sponsor of a defined benefit pension scheme. The report included sections on:

- Assessing risks and evaluating potential impacts
- Implementing risk monitoring measures
- Monitoring financial performance

i) Outline the main financial, operational and legislative risks associated with the defined benefit pension scheme. (5)

ii) Discuss how the risks in part (i) could be assessed and monitored as part of the actuarial control cycle. (3)

iii) Suggest possible solutions to mitigate the main pension scheme risks. (4)
[12]

Q. 4) A valuation of a final salary pension scheme has just been undertaken as on 1st January 2015. The following is a summary of the results:

Market value of assets	: Rs.100m
Actuarial value of assets	: Rs. 75m
Value of total service liabilities	: Rs.160m
Value of past service liabilities	: Rs. 90m
Value of total future contributions	: Rs. 60m
(on Entry Age Method, "EAM")	

- The EAM standard Contribution Rate is 12% of salary based on age 35 at entry.
- Member contributions are 3% of salary.
- The actuarial value of assets has been calculated by using the target notional portfolio mix of 75% equities and 25% bonds, with the respective market value adjustments being 70% and 90%.
- The actual split of the assets at the valuation date was 50% equities and 50% bonds.
- Average age of current membership is 45.

At previous valuations the method adopted took the assets at 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 on 1st January 2015 if the trustees' proposed methodology is used. (3)

The company has commented that if the market value of assets is compared to the value of past service liabilities, there is a Rs. 10m surplus and therefore the total contribution rate should be reduced from the 12% level.

ii) Discuss the company's comments. Your answer should include comments on the suitability of the method used. (9)
[12]

Q. 5) You are the actuary to a non-contributory final salary pension scheme and the following information is available to you.

Valuation Details

	1st January 201X (in millions)	***1st January 201X+3 (in millions)***
Assets	90.0	86.7
Liabilities:		
Actives	50.0	68.7
Deferred Pensioners	8.0	9.0
Current Pensioners	12.0	11.0
Total Liabilities	70.0	88.7
Surplus / (Deficit)	20.0	(2.0)

As a result of the surplus disclosed by the 201X valuation, the employer did not pay any contributions to the Scheme during the inter valuation period.

The financial basis used for both valuations is summarised below:

Interest Rate	5.5% p.a.
Salary Increases	4.0% p.a.
Price Inflation	3.0% p.a.
Pension Increases	3.0% p.a.

The following additional information is available:

- The method used is Projected Unit Method
- Benefit accrual is 1/60ths of pensionable salary for each year of service.
- Normal Retirement Age (NRA) = 65 years
- Annuity at NRA = 18
- Average age of active members on 1st January 201X = 45 years
- Total pensionable salaries on 1st January 201X = 10*m pa*
- Total pensions in payment on 1st January 201X = 1*m pa*
- There have been no changes to the membership over the inter valuation period, in particular no members have left service, retired or died.

i) Set out the main reasons for analysing a surplus or deficit. (3)

ii) Estimate and reconcile the total approximate actuarial gain/loss arising over the inter valuation period in relation to:

- Actives
- Current pensioners
- Contributions
- Investments (12)

iii) Describe how the salary increase experience of a final salary pension scheme would be analysed. (8)

[23]

Q. 6) You are the actuary to a defined benefit scheme which is being discontinued. The trustees are considering the various options available to them.

i) Set out the options for the provision of outstanding benefit payments. (4)

ii) Explain why different assumptions may be used for a discontinuance valuation than for an ongoing valuation. (10)

The trustees want to explore the option to transfer the funds to Insurance Company by purchasing guaranteed benefits. The actuary of the insurance company is provided with the summarised data of the company's pension scheme

iii) State, with reasons, the disadvantages to the insurance company's actuary of accepting membership data in summarised form for the purposes of an actuarial valuation. (2)

[16]

Q. 7) The only benefit provided by a defined benefit pension scheme is a retirement pension for life to the member. The sponsor wants to offer an additional benefit at retirement so that members' can exchange part of their pension to provide a pension payable to their chosen dependant.

The dependant's pension will be paid from the death after retirement of the member, for the remainder of the life of the dependant.

i) Discuss the factors the scheme's actuary would consider to assess the appropriate terms to offer for this option. (8)

ii) Outline any restrictions you might recommend applying on the exercise of the option (3)

[11]

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