INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

18th September 2017

Subject ST4 – Pensions and Other Employee Benefits

Time allowed: Three Hours (14.45* – 18.00 Hours)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATES

1. ***Please read the instructions inside the cover 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 a new set of Question paper from the Invigilator.***

AT THE END OF THE EXAMINATION

Please return your answer booklet and this question paper to the supervisor separately. You are not allowed to carry the question paper in any form with you.

Q. 1) In the context of a defined benefit pension scheme written under trust:

i) State the three main responsibilities of the trustees. (2)

ii) List the four principal duties of a trustee. (2)

iii) Outline the four key trustee powers usually contained in the Trust Deed. (2)
[6]

Q. 2) An employer is considering implementing one of the following pension plan designs:

Option 1: A traditional defined benefit (DB) final average pay plan.

Option 2: A plan in which earnings up to an inflation-linked threshold are covered by a traditional final average pay DB structure and earnings above that threshold are covered by a defined contribution (DC) structure. At retirement, a participant will receive an annuity from the benefit earned under the DB structure with an option to receive an annuity from the benefit earned under the DC structure.

Option 3: A plan in which the employer pays a fixed contribution toward a DB benefit, but the benefit may change periodically based on the funding status of the plan.

Assume the above designs are permissible under the pension legislation applicable in the employer's country.

Describe the risks of each design from the perspectives of:
• The employer; and
• Its employees. **[10]**

Q. 3) **i)** List six stakeholders in a retirement system that covers public sector employees. (3)

ii) Outline the key objectives of four of the stakeholders identified in part (i) in relation to a public sector employees' retirement system. (4)

iii) Set out the considerations when providing enhanced pension benefits to executives in a public sector plan from the point of view of two of the stakeholders in part (i) (3)
[10]

Q. 4) Public and private pension systems have come under increased pressure due to the following conditions:
- Population ageing
- Poor financial market returns
- Low interest rates

i) Explain how each of these conditions impact:
a) Pay-as-you-go public pension systems
b) Funded private pension systems (6)

ii) Suggest six possible policy actions to help improve financial sustainability of public defined benefit pension systems. (3)

iii) Describe the issues associated with using the assumed rate of return on plan assets as the discount rate to measure public sector defined benefit plan liabilities from the perspectives of:

a) Taxpayers;
b) Public employee unions; and
c) The Government. (5)

[14]

Q. 5) **i)** Outline the criteria used to appraise funding methods. (3)

ii) List in normal order of size of actuarial liability, the four main funding methods (lowest first). (1)

iii) You are the actuary to a final salary pension scheme whose members contribute at the rate of 5% of pensionable salaries. An actuarial valuation of the scheme has recently been completed and the following information is available:

Present value of: Units (million)

Benefits for pensioners and deferred pensioners	150
Past service benefits for active members allowing for future salary increases	400
Future service benefits for current active members allowing for future salary increases	500
Future contributions by all current members	200
Contributions by current active members in the year after the valuation date	20

Valuation assumptions: % per annum

Discount rate 8

Salary increases 6

Price inflation 3

The average term to retirement of the active members weighted by salaries is 10 years.

a) Define and calculate the standard contribution rate using the Attained Age Funding Method. (2)

b) Define the actuarial liability using the Attained Age Funding Method. (1)

c) Estimate the standard contribution rate using the Projected Unit Funding Method. (3)

[10]

Q. 6) As actuary to a defined benefit pension scheme, you have recently carried out a three yearly actuarial valuation which has disclosed a large and unexpected surplus on the ongoing funding basis. Legislation in the relevant country requires that any valuation surplus needs to be eliminated over the next three years.

The trustees have asked you to set out the options available to eliminate the surplus.

i) Set out the factors you would take into account in advising on how to eliminate the surplus. (5)

ii) State ways of how the surplus could be used. (5)

Analysis shows that the surplus emerged largely from two sources:

- A large increase in the market value of the scheme's equity investments during the period since the last valuation, considerably in excess of the assumption used in the previous valuation.

- A reduction in the active membership a year ago, when the sponsoring employer reorganised the business and made a reduction in staff numbers. The benefits for early leavers in the scheme are such that significant withdrawal surpluses arise.

These two features have had approximately equal impact.

You have advised that two changes can be made without detriment to the scheme's long term financial position:

- The employer's contribution rate can be halved from 8% to 4% of scheme pensionable salaries for each of the next three years.
- The rate of pension increases in payment can be changed from a fixed rate of 3% per annum to the rate of inflation. This change to the pension increase would apply to pensioners and deferred pensioners as well as current contributing members.

These two changes have the same expected cost, and implementing both of them is affordable.

The employer has proposed that it will implement the contribution reduction, but that there will be no changes to the pension increases and the balance of the surplus will be retained in the scheme.

iii) Discuss this proposal for using the surplus. (15)

Currently, the only benefits provided by the scheme are pensions payable to scheme members after retirement. You have suggested to the employer that adding death benefits by using the surplus will be perceived as a valuable benefit by the employees and comes with a low cost.

The employer is considering extending the scope of the scheme to provide benefits to the dependants of scheme members on the death of a scheme member.

iv) Discuss the issues that the employer should consider before extending the scope of the scheme. (10)

v) Suggest how the employer might mitigate the risks associated with providing dependants' benefits. (4)

[39]

Q. 7) You have recently taken over as Scheme Actuary to a defined benefit pension scheme which provides a pension in retirement of x% of final pensionable salary for each year of pensionable service. All pensions in payment increase in line with inflation. A valuation of the scheme is now due.

i) Set out the information you will require to carry out the valuation. (A list of the individual member data items or actuarial assumptions is not required). (3)

ii) List the checks you would carry out on the individual active member data before carrying out the valuation. (3)

You do not have access to the previous valuation calculations. The only information available to you is the results disclosed in the previous valuation report. You have already carried out an approximate analysis of surplus.

iii) Describe the additional checks you would place on the liabilities to see if your valuation results are consistent with the previous valuation results. (5)

[11]

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