INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

14th March 2018

Subject ST4 – Pensions and Other Employee Benefits

Time allowed: Three Hours (10.15* – 13.30 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) An individual, who is not covered by an employer-sponsored pension plan, must rely on personal savings as his primary source of retirement income. The individual is considering one of the following options after retirement:

Option 1: Continue to manage his investments and annual payouts himself.
Option 2: Use all of his personal savings to buy an immediate lifetime annuity.

i) Describe the advantages and disadvantages of each option from the perspective of the individual. (4)

ii) Explain other options that the individual may want to consider to mitigate the following post-retirement risks:

a) Inflation (2)
b) Interest (2)
c) Stock market (2)

[10]

Q. 2) **i)** Describe the risks that impact an employee's ability to generate adequate retirement income through a defined contribution plan. (4)

ii) Describe actions an employer can take to improve take-up rate and enhance post-retirement income adequacy in a defined contribution plan. (4)

[8]

Q. 3) You are an actuary advising the senior management of a large multinational services company in setting up a new defined contribution scheme for new employees instead of the current defined benefit pension scheme. Set out the various design issues you will discuss with your client before preparing the report. **[10]**

Q. 4) You are the actuary to a long established Defined Benefit Pension scheme. The scheme was closed to new entrants after the previous valuation. The next actuarial valuation is due.

i) Discuss the characteristics of the Projected Unit and Attained Age funding Methods, stating which method may be more appropriate. (4)

ii) Set out simple formulae (ignoring any pre-retirement decrements) that could be used to calculate the Standard Contribution Rates for the Projected Unit and Attained Age funding methods respectively. (4)

iii) Set out the different ways company contributions could be structured to eliminate a funding deficit and outline the characteristics of each method. (4)

[12]

Q. 5) A company has a flexible benefits scheme that allows interchange between three elements of remuneration: pension, annual leave and salary.

The standard package is:
- Pension accrual 1/60th of basic salary.
- Annual leave entitlement of 45 days per annum.
- 100% of gross salary.

The employer's contribution rate for the 1/60th pension is 25% of basic salary. Basic salary is approximately 50% of Gross Salary.

i) An employee with a monthly gross salary of INR 100,000 wishes to flex his benefits to receive a pension of 1/45th accrual. Estimate the cost of "flexing" for this benefit by giving up the leave entitlement without affecting the salary. State your assumptions clearly. (4)

ii) Discuss briefly three problems of "flex" schemes giving simple examples to highlight the problems. (6)

[10]

Q. 6) ABC Company sponsors a significantly underfunded final average earnings defined benefit pension plan with no early retirement subsidies. The Human Resources Manager proposes to offer an early retirement window over the next six months to eligible active employees with 25 years of service.

The window would have the following features:

- Unreduced early retirement benefit; and
- Lump sum benefits option

i) Describe the impact of the window on the following valuation assumptions:

a) Salary increases (2)
b) Retirement rates (2)
c) Termination of employment (2)

ii) Describe the risks of the plan changes from the perspectives of both the plan sponsor and the eligible employees. (6)

[12]

Q. 7) The latest funding valuation of XYZ Company's defined benefit pension scheme has revealed a surplus.

The analysis revealed that salary increase experience over the inter-valuation period reduced the surplus available by a small amount. The Finance Controller of the sponsoring employer believes that average salary increases over the period were broadly equal to the actual inflation experienced over the period. The previous valuation had assumed that salary increases would be in line with inflation. He has asked the actuary to explain why there has been an experience loss in respect of salary increases.

i) Suggest the points that the actuary might make in her response to the Finance Controller. (6)

Now, XYZ Company's objective is to limit the funded status volatility of its defined benefit pension plan.

XYZ Company is considering the following two strategies for the assets backing the pension liabilities of the pension plan:

- Entering into a buy-in annuity contract; or
- Investing in a duration-matched fixed income portfolio.

ii) Describe the due diligence XYZ Company should complete prior to entering into a buy-in annuity contract. (6)

iii) Compare and contrast the two strategies in relation to XYZ Company's objective. (4)

[16]

Q. 8) A new Telecom company has started its operation in a developing country. The CEO's first objective is to attract and retain good staff.

To fulfil his objective, he is considering providing a DC scheme to the company's employees instead of providing high salary increase or high cash component to attract and retain young specialized workforce.

For this purpose, the company approaches a consulting actuary. As a consulting actuary, list the points in relation to the below:

i) Analyse the key issues to be considered in assisting the company in deciding whether or not it should offer a defined contribution pension plan as an alternative to providing higher cash compensation. (4)

ii) Assuming the company implements a defined contribution pension plan, describe the risks that employees will face at retirement and propose options to manage these risks. (4)

Having considered the risks above, as an alternative to the DC Scheme, the Company thinks of providing a Long Term Incentive Plan (LTIP) which pays cash lump sums to employees completing specified periods of service with the employer. The scale of awards is currently as follows:

Service completed	*LTIP (in Rs.)*
2 years	50,000
4 years	100,000
6 years	200,000
8 years	400,000

No lump sum is paid if an individual leaves service or retires for any reason before completion of the required service for the next payment. There is no formal requirement to increase the level of incentive, but they will be reviewed from time to time by the board of the company, and may be increased broadly in line with price inflation.

The finance controller of the company has expressed concern that while this benefit appears relatively cheap to provide initially, it may become a problem at some point in the future, particularly as the amounts are currently decided to be met on a pay as you go basis.

iii) Describe how the actuarial control cycle could be used as a framework for providing advice to the finance controller on this scheme. (6)

The finance controller has asked for actuarial advice on establishing a funded reserve to meet payments under the scheme.

iv) Discuss how to establish an actuarial value for the liabilities of this plan. (8)

[22]

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