INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

23rd November 2023

Subject SA4 – Pensions and Other Benefits

Time allowed: 3 Hours 15 Minutes (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. ***The answers are expected to be India Specific application for the syllabus and corresponding core reading. However, substantially the core reading material is still taken from material supplied by Actuarial Education Company which is meant for UK Fellowship examination. The core reading also contains some material which is India Specific, mostly the IRDA regulation. In view of this, it should be noted that focal point of answers is expected to be India Specific application. However, if application specific to any other country is quoted in the answer the candidate should answer the question with reference to Indian environment.***
3. ***Attempt all questions beginning your answer to each question on a separate sheet.***
4. ***Mark allocations are shown in brackets.***
5. ***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. You are not allowed to carry the question paper in any form with you.

Q. 1) Country X, is an under-developed nation where there is no major social security benefits. It is concerned about the ageing profile of its population. It is in the process of introducing a contributory pension scheme to its citizens. The proposed scheme design is as follows:

- Any citizen of Country X between ages 18 and 40 are eligible to join the scheme and a targeted minimum pension of LC 5000 (Local Currency) per month will start from age 60 who contribute till age 60. The membership to the scheme is optional.
- Age wise contributions schedule is proposed and the contribution schedule which depends upon the age at entry is fixed & is highly subsidized.
- The contribution together with interest based on the actual investment income will be credited to the individuals account and the accumulated corpus at age 60 will be used to buy the required annuity from the insurance companies. If the accumulated corpus is more than sufficient to buy the target minimum pension then the pension amount will be proportionately increased.
- The target pension of LC 5000 per month will be payable to the member and on his/her death the pension amount will continue for spouse and on death of spouse, the accumulated corpus at age 60 will be paid to the nominee.
- Pre mature withdrawals before age 60 allowed with return of accumulated contribution.

Before finalizing the scheme, the Finance Ministry of the Country X wants to understand the impact on its financial budgetary provisions, risks & other operating concerns related to the proposed pension scheme. They have approached you, a consultant actuary on this issue especially on guarantees involved, gap funding, Investment strategy and the annuitization of benefits.

i) What will be the objectives of the Government while introducing a pension scheme to its citizens and to what extent these objectives are met in the proposed scheme. (6)

The Ministry wants to understand the financial significance of the guarantee of monthly pension available in the scheme.

ii) Describe how the cost of guarantee provided during the accumulation phase of the above scheme can be estimated at the beginning of the scheme & how the cost will vary after the implementation of the scheme over a period of time. (10)

The Ministry also wants to know how the cost of guarantee can be funded during the accumulation period.

iii) Explain several options available to the Government on funding the guarantee and the risks associated with each of the funding options. (7)

iv) Discuss how a suitable investment strategy can be formed for this pension scheme considering the funding options, guarantees, risks and rewards involved. (10)

Due to the higher cost involved in purchasing annuity from Insurance Companies, the Ministry is examining an alternative proposal of providing pension. As per the proposal, on vesting, the fund available in the member account will be transferred to an Pension Pool Fund (PPF) created specially for this purpose and the guaranteed pension of LC 5000 per month &

the lump sum death benefits will be paid out from the PPF fund. The Ministry is asking you to prepare a note on the new proposal.

v) Draft a note explaining the key risks involved in the above arrangement, taking into account the underlying guarantee & how the risks can be managed through a suitable funding & investment management of the scheme. The note may suggest other options available to manage the risks. (12)

Country X is under obligation to provide suitable disclosures on its social security programs to International Credit Rating Agencies every year.

vi) Suggest the key points which have to be covered under the disclosure report. (5)

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Q. 2) An Indian company with significant foreign investors is intending to offer a defined benefit pension benefits to its employees with the following features:

- Pension equal to 50% of the last drawn basic salary if the employee has completed 25 years of service before retirement.
- Pension amount increases by fixed 3% every year.
- Spouse pension for death after retirement equal to 50% of the benefit receivable by the primary member.
- Retirement age is 60 years. Early retirement is available from age 55 but the pension amount reduces by 5% for each year of early retirement period.
- No contributions are expected from the employees.

The company has 2500 employees comprising of Indians and foreign nationals with total monthly basic salary of INR 7.5 crores. The average past duration of service of the employees is around 14 years.

The company is yet to decide whether to self-administer the benefits or to purchase annuities from an insurer. Most of the insurance companies are offering the following annuities:

Annuity type	Current premiums
I. Single life annuity with level monthly payments	INR 14 for INR 1 annual pension
II. Joint life annuity with level monthly payments and surviving member receives 50% of the annuity receivable by the primary member	INR 17 for INR 1 annual pension
III. Single life annuity with annual 3% increments	INR 21 for INR 1 annual pension

i) Discuss possible reasons why a company may want to start a DB scheme when the market at large is moving towards DC schemes. (6)

The company has approached you for evaluating the past service obligation arising on the company and advise on building up the fund should this scheme be implemented.

ii) Describe the data requirements and the approach an Actuary should use to value the obligation and contribution rates in this case. (8)

The scheme has been implemented in Jan 2023 and your valuation as per AS 15 for valuation date 31-Mar-2023 revealed the following results:

Present value of Obligation	INR 520 crores
Fair value of assets (fixed income securities)	INR 150 crores
Average age of member	45 years
Weighted average term of obligation	14 years
PUSCR	7.50%
Salary growth assumed	6.00%
Discount rate assumed	7.00%

The company has requested you to generate a roll-forward report without performing the full actuarial valuation based on the following inputs.

Average salary hike implemented	7.5%
Number of exits (before 55 years of age)	500
Number of retired members receiving pension benefits	40
Number of new employees	700
Amount contributed to fund	INR 50 crores
Amount paid as pension	INR 0.4 crores

The yields on g-sec have increased by 0.5% for all tenures and the company expects that the salaries will increase by 6.25% for future years.

iii) Estimate the projected value of closing obligation as on 31-Mar-2024 and prepare a reconciliation (together with assumptions if any) of the present value of obligation from 01-Apr-2023 to 31-Mar-2024. The items of reconciliation should be consistent with those required under AS 15. (12)

Members of the scheme are concerned with low funding level (29%) of the scheme. The company intends to strengthen the funding level of the scheme over a period of time. There is also a view that the company should use fund-based insurance products to improve its funding levels.

iv) Prepare a detailed response explaining the possible sources of deficit, several approaches to strengthen the funding level, and the merits & demerits of using insurance products to reduce the deficit. (12)

It has been 10 years since the implementation of the scheme and scheme is now 70% funded. There are multiple changes in the management group of the company and the new management is of the view that the pension scheme is significantly impacting the profits & competitive edge of the company. They want to evaluate various options to reduce the costs and risks of this scheme to the company.

v) Discuss the several options available to the company to de-risk this scheme. (12)
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