

# INSTITUTE OF ACTUARIES OF INDIA

## EXAMINATIONS

**7<sup>th</sup> September 2018**

**Subject SA4 – Pensions & 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 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 applications or work carried out from within India, mostly the APS/GNs issued by ASI/IAI, Accounting Standards by ICAI, Indian Tax and other relevant documents and funding or accounting standards issued by other bodies outside India. In view of this, it should be noted that focal point of answers is expected to be India Specific application for work generally carried out of India. However if application specific to any other country is quoted in the answer, the same you should answer the question with reference to Indian environment.*
- 5. Attempt all questions in order of sequence.*
- 6. Begin answer to each question on a separate sheet, however answer to sub-questions can be on the same sheet.*
- 7. Mark allocations are shown in brackets.*
- 8. Please check if you have received complete Question Paper and no page is missing. If so then kindly get new set of Question Paper from the Supervisor.*

**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)** A healthcare company owns and runs full medical hospital facilities across the country in 20 locations. The facilities include full hospital stay facilities, as well as outpatient care. The facilities are open to the general public but also for its own employees, retired staff (including their dependants) for many years. There are about 20 facilities across the country providing general care, as well as specialised treatment for heart and cancer patients. All employees and retired staff (including dependants) of the company are treated free irrespective of the condition and without any limit.

The Company's new auditor has informed the CFO that they must obtain an actuarial valuation for the post-employment medical benefit they provide to retired staff, in order to account for these costs as per employee benefits accounting standards.

This has come as a surprise to the CFO and she has many questions and has contacted you as a consulting actuary.

Set out the points you would make in response to the following comments she has made to you:

- i)** "The company is already paying for all the medical facilities and its medical staff. Why do I need to make further provisions for the cost of medical treatment for the employees and retirees?" (6)
- ii)** "What data would you require for such an exercise?" (3)
- iii)** "The auditor has mentioned a discount rate for valuations. I use 12% p.a. internal rate of return for project financing so please use that." (4)
- iv)** "What other assumptions are required and how will you determine them?" (7)
- v)** "Assumptions might need a lot of information so let me know the alternative approaches as proxies for the key assumptions, if we don't have the data in full." (6)

Having further deliberated on the matter for a few days, the CFO asks you to prepare a presentation for the Board. What points would you include in your presentation to cover the following aspects?

- vi)** What are the key risks in making the hospital facilities available to retired staff as an employee benefit? (5)
- vii)** What design control strategies can we put into place and outline the pros and cons of each suggestion. (9)
- viii)** What considerations and implications would there be if the company intends to buy a group insurance health policy providing benefits up to a limit for its retired staff up to their 80<sup>th</sup> birthday but they still avail the same full benefits and facilities as before. (5)
- ix)** How do the considerations and implications change if the entire benefit is simplified so that all retirees are provided a typical annual renewable health insurance family floater policy of Rs. 300,000 per annum up to age 80? (5)

[50]

- Q. 2)** The Government of a small country (with currency K) after presenting Surplus budget for consecutive 5 years planned to introduce a “Comprehensive Social Security Scheme” for its Senior Citizens. The benefits it aimed to provide included:
- Death benefit to cover the cost of funeral/burial expenses
  - Pension commencing from age 60 to provide regular income during old age. Those aged 60 and above will get pension with immediate effect
  - Health Care in old age aimed at providing financial relief to those senior citizens suffering from ”terminal illness”

The age distribution of the estimated population (of 6 crore) of the country is as under:

Age band	Proportion
Less than 20	25%
Between ages 20-40	40%
Between ages 40-60	23%
Between ages 60-80	10%
Greater than age 80	2%

The Government expected that the proportion will be slowly shifting towards elderly people due to decreasing fertility rate as also due to the efforts made by the Government in enhancing the health and living standard of the population of the country.

The Government at that time wanted to understand the financial implications of the proposal especially its impact on the country’s budget. As a Consultant Actuary you were engaged to design the scheme suitably and arrive at the estimated annual cost. You, at that time were asked to give a presentation on the above proposal to the Government Officials of the Country:

- Discuss the factors to be considered by the Government before introducing the “Social Security Scheme”. The benefits were payable to all existing Senior Citizens who were above age 60. (10)

After the initial discussion, the Government decided to introduce the following benefits to Senior Citizens:

- A monthly pension of K500 payable during the life time of the Senior Citizen. The monthly pension will be increasing with a simple increase of 3% per annum.
  - In case a pensioner suffers from any of pre-defined “terminal illness”, the monthly pension will be enhanced to twice of the normal monthly pension.
  - On death of the pensioner a lump sum equal to 24 times of the monthly pension at the time of death will be given as lump sum or funeral/burial expenses.
- Describe the process (step by step approach) that might have been used by you to determine the annual cost of providing the above benefits. (6)
  - Discuss the points (with reference to the APS 20 issued by the Institute of Actuaries of India) you might have taken into account while presenting the results of your Actuarial Work to the Government. (9)

The Government considered two alternatives for financing the Scheme viz a) by making provisions in the annual budget for the benefits in payment on PAYG basis, and b) a prefunded approach in which all citizens in the age group between ages 20-59 make a pre-determined schedule of contributions to become eligible for the benefits.

- iv)** You were advised to examine the two proposals and submit a report on these proposals. Discuss the points you might have included in the report. (7)

The Government of the Country, on receiving your report decided to adopt a pre funded approach to finance the Scheme. The Government also considered to give exemption to the employers from the State Scheme (both in terms of benefits and schedule of contributions) provided the employer offers equal to or higher benefits than specified in **(i) (a), (b) & (c)**.

The Government therefore wanted to develop a mechanism to check the adequacy of benefits provided by the Scheme of an employer seeking exemption from the State Scheme. It was proposed that the adequacy of benefits would be certified by an Actuary based on which exemptions will be given by the Government.

- v)** Develop a mechanism for an Actuary to test the adequacy of benefits through an actuarial modelling work? State the points to be included while certifying the exemptions. (8)

The Scheme has run thereafter for several years. The Government now finds that the benefits outgo is much higher than that initially estimated causing strain on the financial resources. Therefore the Government is now considering increasing the pensionable age from existing 60 to 62.

- vi) a)** List the potential reasons for the experience to be worse than the initial estimates. (2)

- b)** Calculate the potential saving in the cost due to above proposal using following information:

- 360,000 people reach age 60 in first year increasing by 1% pa thereafter
- 1% of the people die aged 60 last birthday out of those reaching 60 in a year
- Mortality increases by 8% compounding for each subsequent age thereafter
- 50% of the people are diagnosed with terminal illness out of those die after age 60 onwards and such terminally ill survive for 6 months on an average

- (You may state other assumptions used in the calculations) (8)

**[50]**

\*\*\*\*\*