

Question 54

The accrued liability under the entry age normal funding method is equal to the accumulated value of the prior normal costs (as of the valuation date). The normal costs are based upon the projected benefit at assumed retirement age (65 in this question, per the general conditions of the exam).

Smith was hired at age 45 and is age 45 as of the valuation date, so there is no accrued liability for Smith because Smith has no past service.

Jones was hired at age 45 and is age 55 as of the valuation date, and will have 20 years of service at retirement.

Jones' projected benefit at age 65 = \$300 × 20 years of service = \$6,000

The present value of benefits must be determined at entry age (age at hire). The commutation functions can be used to determine that present value.

$$\begin{aligned} \text{Jones PVFB}_{45} &= \$6,000 \times \ddot{a}_{65} \times \frac{D_{65}}{D_{45}} = \$6,000 \times \frac{N_{65}}{D_{65}} \times \frac{D_{65}}{D_{45}} \\ &= \$6,000 \times \frac{N_{65}}{D_{45}} = \$6,000 \times \frac{22,745}{7,142} = \$19,108 \end{aligned}$$

The normal cost is equal to the PVFB amortized over the total years to retirement.

$$\begin{aligned} \text{Jones NC} &= \text{PVFB}_{45} / \ddot{a}_{45:\overline{20}|} = \$19,108 / \left(\frac{N_{45} - N_{65}}{D_{45}} \right) \\ &= \$19,108 / \left(\frac{106,115 - 22,745}{7,142} \right) = \$1,637 \end{aligned}$$

The accrued liability is equal to the accumulation of the past normal costs through Jones' current age on 1/1/2014 (10 years of accumulation from age 45 to 55).

$$\begin{aligned} \text{Jones AL} &= \text{NC} \times \ddot{s}_{45:\overline{10}|} = \$1,637 \times \left(\frac{N_{45} - N_{55}}{D_{55}} \right) \\ &= \$1,637 \times \left(\frac{106,115 - 52,143}{3,932} \right) = \$22,470 \end{aligned}$$

Brown was hired at age 45 and is age 65 as of the valuation date, and has 20 years of service at retirement.

Brown's projected benefit at age 65 = $\$300 \times 20$ years of service = $\$6,000$

Since Brown is at retirement age, the accrued liability is simply the present value of benefits.

$$\text{Brown PVFB} = \$6,000 \times \ddot{a}_{65} = \$6,000 \times \frac{N_{65}}{D_{65}} = \$6,000 \times \frac{22,745}{2,090} = \$65,297$$

The total accrued liability is:

$$\$22,470 + \$65,297 = \$87,767$$

Answer is D.

Question 55

In the case of a multiple employer plan, IRC section 413(c)(4)(A) states that for plans established after 1988, the minimum required contribution is determined separately for each employer. The minimum required contribution must be determined separately for each of Employers A, B, and C.

The minimum required contribution under IRC section 430(a)(1)(i) is equal to the sum of the target normal cost, the shortfall amortization charge, and the waiver amortization charge (if any waiver exists).

Minimum required contribution for Employer A = \$400,000 + \$80,000 = \$480,000

The smallest amount that satisfies the minimum funding standard is equal to the minimum required contribution reduced by the funding balances (provided the employer elects to use the funding balances to reduce the minimum). The general conditions of the exam state that unless it is stated otherwise, the employer elects to use the funding balances to reduce the minimum required contribution to the extent they are available. However, the funding balances can only be used to reduce the minimum required contribution if the ratio of the actuarial value of assets (reduced by the prefunding balance but not the carryover balance) to the funding target in the prior year is at least 80%. It is given that the FTAP for the prior year (2013), which also includes the assets reduced by the carryover balance, is 85% for Employer A. If the assets had not been reduced by the carryover balance, then the FTAP would have been even larger than 85%. Therefore, the funding balances can be used to reduce the minimum required contribution for Employer A for 2014.

$\$X = \$480,000 - \$150,000 - \$100,000 = \$230,000$

Answer is A.

Question 56

The normal cost under the Aggregate cost method is generally equal to:

$$\frac{\text{Present value of future benefits} - \text{Actuarial value of assets (reduced by the credit balance)}}{\text{Temporary annuity}}$$

When the plan benefits are based upon compensation, the temporary annuity is equal to the ratio of the present value of future compensation to current compensation.

Generally, when there are mandatory employee contributions, the total normal cost is calculated and then reduced by the current year employee contributions. The amount of the current year employee contribution is not known. Therefore, an alternative method must be used. The total present value of future benefits is reduced by the present value of future employee contributions in the direct determination of the employer normal cost.

$$\text{Employer normal cost} = \frac{\$10,000,000 - \$200,000 - \$4,500,000}{\$6,500,000 / \$1,000,000} = \$815,385$$

Answer is A.