a/s/m

EA-2F Exam

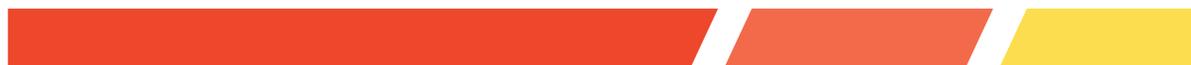## Solutions

David B. Farber, A.S.A.

NO RETURN IF OPENED

TO OUR READERS:

Please check A.S.M.'s web site at **www.studymanuals.com** for errata
and updates. If you have any comments or reports of errata, please
e-mail us at **mail@studymanuals.com**.

IMPORTANT

<u>THESE FACTORS MAY BE USED FOR ALL QUESTIONS UNLESS OTHER FACTORS ARE PROVIDED,</u>
<u>FOR BOTH SINGLE EMPLOYER AND MULTIEMPLOYER PLANS</u>

2022 EA-2 (Segment F) Examination - Selected Commutation Factors
Interest Rates: 5.0%, 6.0%, and 7.0%

MALES	Interest Rate = 5.0%		Interest Rate = 6.0%		Interest Rate = 7.0%		MALES
Age	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$	Age
60	50,097	681,130	28,367	350,697	16,149	182,683	60
61	47,407	632,266	26,591	323,144	14,996	167,062	61
62	44,837	586,037	24,912	297,323	13,918	152,560	62
63	42,380	542,326	23,325	273,138	12,910	139,104	63
64	40,032	501,022	21,825	250,501	11,966	126,627	64
65	37,787	462,019	20,406	229,326	11,084	115,065	65
66	35,640	425,216	19,065	209,535	10,259	104,359	66
67	33,586	390,518	17,797	191,051	9,487	94,454	67
68	31,621	357,832	16,598	173,803	8,765	85,298	68
69	29,740	327,073	15,463	157,725	8,090	76,843	69
70	27,937	298,159	14,389	142,755	7,457	69,043	70
71	26,209	271,014	13,371	128,832	6,865	61,857	71
72	24,550	245,565	12,407	115,903	6,310	55,246	72
73	22,956	221,746	11,492	103,916	5,790	49,175	73
74	21,424	199,492	10,623	92,822	5,303	43,608	74
75	19,949	178,745	9,799	82,576	4,845	38,515	75
76	18,528	159,447	9,015	73,137	4,416	33,866	76
77	17,159	141,546	8,270	64,463	4,013	29,634	77
78	15,839	124,992	7,562	56,517	3,635	25,794	78
79	14,565	109,737	6,888	49,264	3,281	22,321	79
80	13,336	95,736	6,247	42,670	2,948	19,193	80
81	12,151	82,943	5,639	36,701	2,635	16,389	81
82	11,012	71,314	5,062	31,327	2,344	13,887	82
83	9,918	60,804	4,516	26,516	2,071	11,668	83
84	8,870	51,366	4,001	22,236	1,818	9,713	84
85	7,869	42,955	3,515	18,458	1,583	8,003	85

FEMALES	Interest Rate = 5.0%		Interest Rate = 6.0%		Interest Rate = 7.0%		FEMALES
Age	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$	Age
60	51,383	731,957	29,095	375,125	16,563	194,614	60
61	48,713	681,798	27,324	346,842	15,409	178,580	61
62	46,162	634,254	25,648	320,286	14,329	163,665	62
63	43,724	589,209	24,064	295,364	13,319	149,799	63
64	41,394	546,553	22,567	271,986	12,373	136,914	64
65	39,167	506,180	21,152	250,067	11,489	124,946	65
66	37,038	467,989	19,813	229,529	10,661	113,836	66
67	35,003	431,883	18,548	210,296	9,887	103,529	67
68	33,055	397,773	17,351	192,297	9,163	93,974	68
69	31,191	365,572	16,218	175,465	8,484	85,123	69
70	29,405	335,200	15,145	159,740	7,849	76,930	70
71	27,692	306,580	14,128	145,061	7,253	69,354	71
72	26,048	279,642	13,164	131,375	6,695	62,356	72
73	24,468	254,318	12,249	118,631	6,172	55,901	73
74	22,949	230,546	11,380	106,780	5,680	49,954	74
75	21,488	208,266	10,555	95,778	5,219	44,485	75
76	20,080	187,424	9,770	85,583	4,786	39,465	76
77	18,722	167,966	9,023	76,155	4,379	34,865	77
78	17,411	149,846	8,312	67,458	3,996	30,661	78
79	16,143	133,016	7,634	59,456	3,636	26,830	79
80	14,917	117,435	6,988	52,118	3,297	23,350	80
81	13,729	103,063	6,371	45,413	2,978	20,199	81
82	12,580	89,860	5,783	39,312	2,678	17,359	82
83	11,470	77,789	5,223	33,786	2,396	14,811	83
84	10,397	66,811	4,689	28,808	2,131	12,536	84
85	9,362	56,888	4,183	24,350	1,883	10,519	85

2022 EA-2 (Segment F) Examination - Selected Amortization Factors

Segment Rates = {5.0%, 6.0%, 7.0%}

Remaining Period	Amortization Factor
15 years	10.3758
14 years	9.9335
13 years	9.4647
12 years	8.9677
11 years	8.4409
10 years	7.8825
9 years	7.2906
8 years	6.6632
7 years	5.9982
6 years	5.2932
5 years	4.5460
4 years	3.7232
3 years	2.8594
2 years	1.9524

Solutions to EA-2(F) Examination
Fall, 2022

Question 1

The minimum required contribution is equal to the target normal cost plus the amortization of the shortfall bases plus the amortization of any waived funding deficiencies.

The funding shortfall is the excess of the funding target over the actuarial value of assets (reduced by the funding balances).

Funding shortfall$_{1/1/2023}$ = \$450,000 – \$500,000 = \$0

The funding shortfall cannot be less than \$0. When the funding shortfall is zero, there is no new shortfall amortization base, and the prior year shortfall bases are deemed to be fully amortized (IRC section 430(c)(6)).

In addition, the excess of the actuarial value of assets (reduced by the funding balances) over the funding target is a credit used to reduce the target normal cost (IRC section 430(a)(2)).

2023 minimum required contribution = \$250,000 – (\$500,000 – \$450,000) = \$200,000

The **smallest amount that satisfies the minimum funding standard** (\$X) as of 9/15/2024 is equal to the minimum required contribution, reduced by any funding balances, and increased with interest at the effective interest rate from 1/1/2023 to the date of the contribution. Note that it is important to know that the plan is not subject to quarterly contributions in 2023 because penalty interest would have applied to the late quarterly contributions.

$X = \$200,000 \times 1.05^{20.5/12} = \$217,384$

Answer is B.

Question 2

The funding target is equal to the present value of the benefit accrued as of the first day of the year. Smith is age 65 (normal retirement age under the general conditions of the exam) as of 1/1/2023, so the funding target will be equal to the present value of the future expected retirement benefits.
.
Treasury regulation 1.430(d)-1(f)(4)(ii)(B) requires that for funding purposes, a lump sum must generally be valued using the 417(e) mortality (post-retirement) and using the funding segment rates. However, regulation 1.430(d)-1(f)(4)(iii)(D) provides that when the plan equivalence for determining the lump sum value (at retirement age) is an interest rate other than the 417(e) applicable interest rate, then the lump sum is valued using the applicable mortality table for post-retirement mortality, and either the plan interest rate or the 417(e) applicable interest rate for post-retirement interest, whichever gives the larger present value.

In this question, the immediate annuity factor for determining the lump sum based upon the plan interest rate (12.621) is larger than the factor using the 417(e) applicable interest rate (11.461), so the plan interest rate of 5% is used.

$X = $ Funding target for Smith $ = \$100 \times 12 \times 12.621 = \$15,145$

Answer is D.

Question 3

The amount of the required quarterly contribution installment under IRC section 430(j)(3)(D) is equal to 25% of the smaller of 90% of the minimum required contribution for the current year or 100% of the minimum required contribution for the preceding year.

In determining quarterly contribution installments for a plan year, if either the current year or the prior year is a short plan year, then the minimum required contribution in that calculation must be determined based upon whether the current plan year is a short year or a full year. If the current year is a full year and the prior year a short year, then the prior year minimum required contribution must be annualized to reflect what it would have been had the prior year been a full year. Alternatively, if the current year is a short year and the prior year a full year, then the prior year minimum required contribution must be pro-rated to reflect what it would have been had the prior year been a short year (covering the same number of months as the current short year). See Treasury regulation 1.430(j)-1(c)(7).

Because the prior year in this question was a short year, for purposes of taking 100% of the prior year minimum required contribution, the prior year short year minimum must be annualized. The statement is false.

Answer is B.