



SoftwarePolish

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FALL 1987 EA-2 EXAM SOLUTIONS

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The solutions for this year's exam use end of year amortization payments in setting up the Minimum Funding Standards Account. This is a change from the approach used in prior year's solutions. I believe that this change eliminates a step in calculating the minimum contribution, since most questions ask for the minimum contribution payable at the end of the year.

These solutions were prepared based on the law as in effect at June 30, 1987. The passage of the Pension Protection Act in December of 1987 resulted in significant changes in the calculations under Section 404 and 412 of the Internal Revenue Code. Some of the solutions mention changes in amortization periods for gains and losses, assumption changes, and waivers that would take effect in 1988 and 1989.

I would like to thank Al Aki and Tom Tredway for their assistance in reviewing these solutions. Without their help, these solutions would STILL contain several errors. As usual, it seems easy to get an answer in the correct range as long as you are not actually taking the exam!

Revision History:

10/27/88 Corrected problem 01, page 1
10/27/88 Corrected problem 11
10/27/88 Corrected problem 19, page 2
10/29/88 Corrected problem 29
11/06/93 Corrected answer range letters for problem 32
10/01/95 Corrected problem 15
11/02/95 Corrected problem 30

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Problem 1 - Page 1

The Aggregate cost method sometimes requires special adjustments under 412, which are a consequence of the reasonable funding methods regulation at 1.412(c)(3)-1. In this problem you are given the Entry Age Normal valuation results, which must be used to check the Full Funding Limitation.

You are told that a funding deficiency exists, but not that a waiver was granted. You must assume that the entire debit balance is paid in the next year. Even though the problem asks for the deductible limit, it is necessary to do calculations for the MFSA. This is because the deductible limit may equal the amount required under 412, if it is greater than the amount calculated based on the normal cost plus limit adjustments.

Section 404 deductible limit calculations

$$\begin{aligned} \text{PV Future Normal costs} &= \text{PV Future Benefits} - \text{Actuarial Assets} \\ &= 1,740,000 - 695,000 = 1,045,000 \end{aligned}$$

$$\begin{aligned} \text{PV Future Earnings} \div \text{Earnings} &= 18,100,000 \div 1,500,000 \\ &= 12.0667 \end{aligned}$$

$$\begin{aligned} \text{Normal Cost} &= 1,045,000 \div 12.0667 = 86,602 \text{ at } 1-1-87 \\ \text{Limit adjustments} &= 0 \text{ since no bases under Aggregate method} \end{aligned}$$

$$\begin{aligned} \text{Deductible limit is adjusted with interest to earlier of end of the plan} \\ \text{year, or end of the tax year: } 1.07 (86,602) &= 92,664 \end{aligned}$$

The definition of the Full Funding Limitation is the excess of the Accrued Liability including Normal Cost over the lesser of the Market or Actuarial value of assets. For any aggregate cost method which does not directly generate an Accrued Liability, the Entry Age Normal Accrued Liability and Normal Cost must be used.

The Full Funding Limitation is always adjusted with interest to the end of the plan year. If there are any carryover contributions for 404 purposes, then the FFL under 404 is increased by the unadjusted amount of the carryover contributions (see Revenue Ruling 82-125).

$$\begin{aligned} \text{FFL} &= 1.07 (690,000 + 87,000 - 695,000) \\ &= 87,740 \end{aligned}$$

Since the FFL is less than the normal cost plus limit adjustments, the deductible limit is 87,740. Even though this amount is calculated at the end of the year, it can be contributed at any date

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Problem 1 - Page 2

Section 412 minimum contribution calculations

PV Future Normal costs = PV Future Benefits - Actuarial Assets -
O/S 412 amortization bases + credit balance
= 1,740,000 - 695,000 - 10,000 debit balance
= 1,035,000

The calculation of the PVNC is in accordance with the general rule that must be satisfied by all reasonable cost methods - see the regulation at 1.412(c) (3)-1.

PV Future Earnings ÷ Earnings = 18,100,000 ÷ 1,500,000
= 12.0667

Normal Cost = 1,035,000 ÷ 12.0667 = 85,774 at 1-1-87

Now set up the MFSA for 1987 and calculate the minimum required contribution:

Minimum Funding Standards Account for 1987

<u>Charges</u>	<u>Credits</u>
Debit balance 1.07(10,000)	Credit balance 0
Normal cost 1.07(85,774)	Min contrib 12/31 x
<hr/>	<hr/>
102,478	x

This seems to imply that the minimum contribution is 102,478, but that is incorrect. It is necessary to check the Full Funding Limitation for purposes of 412. Based on the 12/82 proposed regulation, the Accumulated Funding Deficiency based on no contribution and no credit balance must be calculated; this is simply the charges of 102,478 in this problem. Next the FFL is calculated under 412. The definition is similar to that under 404, except that the asset value is adjusted by the credit balance:

FFL = 1.07 (690,000 + 87,000 - (695,000 + 0))
= 87,740.

The calculation shown above does NOT treat the deficiency at 12/31/86 as a negative credit balance. This is based on Rowland Cross' presentation at the 1987 Enrolled Actuaries Meeting on "Full Funding Limitation and Schedule B Problems". If the Accumulated Funding Deficiency exceeds the Full Funding Limitation, then there is a credit in the MFSA equal to the excess:

FFL credit = 102,478 - 87,740 = 14,738.

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Problem 1 - Page 3

Now set up the final MFSA for 1987:

Minimum Funding Standards Account for 1987

<u>Charges</u>	<u>Credits</u>
Debit balance 1.07(10,000)	Credit balance 0
Normal cost 1.07(85,774)	FFL credit 12/31 14,738
	Min contrib 12/31 x
<hr/> 102,478	<hr/> 14,738+x

The minimum contribution required under 412 is one that results in a zero credit balance:

$$102,478 = 14,738 + x \quad x = 87,740$$

which is equal to the FFL calculated under 404. Since the minimum required under 412 is equal to the deductible limit, the original calculation of 87,740 for the deductible limit is the final answer.

answer is C

The effect of the rules under 412 regarding the FFL is

- (i) the only purpose of the FFL check is to calculate the amount of the FFL credit,
- (ii) with a zero credit balance, the minimum contribution will be equal to the FFL,
- (iii) if a credit balance exists, the FFL credit will be reduced. The minimum contribution plus the credit balance at the end of the year will still be equal to the FFL unless the FFL credit is not required,
- (iv) if a contribution equal to the FFL is paid, then the credit balance simply increases with interest during the year.

Several examples based on this problem may clarify these statements:

10,000 debit balance

$$\begin{aligned}
 \text{PVNC} &= 1,740,000 - 695,000 - 10,000 \text{ debit balance} = 1,035,000 \\
 \text{Normal Cost} &= 1,035,000 \div 12.0667 = 85,774 \quad (91,778 \text{ at } 12/31/87) \\
 \text{FFL} &= 1.07 (690,000 + 87,000 - (695,000 + 0)) = 87,740 \\
 \text{FFL credit} &= 102,478 [\text{AFD excluding contribution} + \text{CB}] - 87,740 = 14,738 \\
 412 \text{ min} &= 102,478 - 14,738 = 87,740 \\
 412 \text{ min plus CB} &= 87,740 + 0 = 87,740 \text{ FFL}
 \end{aligned}$$

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Problem 1 - Page 4

0 credit balance

PVNC = 1,740,000 - 695,000 + 0 credit balance = 1,045,000
Normal Cost = 1,045,000 ÷ 12.0667 = 86,602 (92,664 at 12/31/87)
FFL = 1.07 (690,000 + 87,000 - (695,000 + 0)) = 87,740
FFL credit = 92,664 [AFD excluding contribution + CB] - 87,740 = 4,924
412 min = 92,664 - 4,924 = 87,740
412 min plus CB = 87,740 FFL

4,000 credit balance

PVNC = 1,740,000 - 695,000 + 4,000 credit balance = 1,049,000
Normal Cost = 1,049,000 ÷ 12.0667 = 86,933 (93,019 at 12/31/87)
FFL = 1.07 (690,000 + 87,000 - (695,000 - 4,000CB)) = 92,020
FFL credit = 93,019 [AFD excluding contribution + CB] - 92,020 = 999
412 min = 93,019 - 1.07(4,000) - 999 = 87,740
412 min plus CB = 87,740 + 1.07(4,000) = 92,020 FFL

If FFL is paid as the minimum, next year's credit balance equals this year's accumulated with interest:

93,019 charges - 1.07(4,000) CB - 999 FFL credit - 92,020 FFL
= 4,280 = 1.07(4,000)

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Problem 2 - Page 1

In this problem the valuation method is Entry Age Normal. You can not check the Full Funding Limitation because the market value of assets is not given.

You are told that a funding deficiency exists, but not that a waiver was granted. You must assume that the entire debit balance is paid in the next year.

Since this is an individual cost method, you should check for any experience gains or losses. In this problem you are told that the only one occurred in 1983. The key to this problem is calculating the amount of the experience gain in 1983. To do this, you must use the formulas that are applicable to all reasonable funding methods (1.412(c)(3)-1):

$$\text{PV Future Normal costs} = \text{PV Future Benefits} - \text{Actuarial Assets} - \text{O/S 412 amortization bases} + \text{credit balance}$$

For cost methods with Unfunded Actuarial Liabilities, this can be restated as $\text{UAL} = \text{O/S 412 bases} - \text{credit balance}$.

$$\begin{aligned} 500,000 &= 1,500,000 - 530,000 - \text{O/S 412 bases} - 10,000 \text{ debit balance} \\ \text{O/S 412 bases} &= 1,500,000 - 500,000 - 530,000 - 10,000 \\ &= 460,000 \end{aligned}$$

The O/S 412 bases consist of the remaining portion of the base set up at 01/01/82 for the initial accrued liability, and the base set up at 01/01/84 for the 1983 experience gain. For valuation dates after 1988, the amortization period for gains and losses is five years. For prior years, gains and losses were amortized over 15 years.

$$460,000 = a_{\overline{25}|.07} (500,000 \div a_{\overline{30}|.07}) - a_{\overline{12}|.07} (\text{GAIN} \div a_{\overline{15}|.07})$$

Instead of solving for the amount of the gain base, you should calculate the amortization payments needed for the MFSA:

$$\begin{aligned} 460,000 &= 11.6536(500,000 \div 12.4090) - 7.9427(\text{GAIN} \div 9.1079) \\ 7.9427(\text{GAIN} \div 9.1079) &= 11.6536(40,293) - 460,000 \\ \text{GAIN} \div 9.1079 &= (469,560 - 460,000) \div 7.9427 \\ &= 1,204 \end{aligned}$$

The amortization for the initial base is 40,293 and the amortization for the gain is 1,204, both at the end of the year.

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Problem 2 - Page 2

Minimum Funding Standards Account for 1987

<u>Charges</u>		<u>Credits</u>	
Debit balance	1.07(10,000)	Credit balance	0
Normal cost	1.07(25,000)	Gain amort 12/31	1,204
IAL amort 12/31	40,293	Min contrib 12/31	x
	<hr/>		<hr/>
	77,743		1,204+x

The minimum contribution required under 412 is one that results in a zero credit balance:

$$77,743 = 1,204 + x$$

$$x = 76,539$$

answer is E

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Problem 3 - Page 1

In this problem you are given the Entry Age Normal valuation results, which must be used to check the Full Funding Limitation. Revenue Procedure 85-29 contains the rules for setting up a new amortization base when there is a change in cost method. The amortization period is the greater of the remaining period for amortizing the initial accrued liability, or the lesser of (i) 15 years, or (ii) the average future working lifetime of the active population.

The amount of the amortization base must satisfy the formulas that are applicable to all reasonable funding methods (1.412(c)(3)-1):

$$\text{PV Future Normal costs} = \text{PV Future Benefits} - \text{Actuarial Assets} - \text{O/S 412 amortization bases} + \text{credit balance}$$

For cost methods with Unfunded Actuarial Liabilities, this can be restated as $\text{UAL} = \text{O/S 412 bases} - \text{credit balance}$. Since this plan was valued under the Aggregate method prior to 1987, the only 412 amortization base is the new one required for the change to the FIL method. To set up a plan under the FIL method, the initial unfunded liability is set equal to the UAL under the EAN method:

$$\begin{aligned}\text{UAL} &= 480,000 \text{ EAN AL} - 160,000 \text{ AAV} \\ &= 320,000\end{aligned}$$

$$\begin{aligned}\text{UAL} &= \text{O/S 412 bases} - \text{CB} \\ 320,000 &= \text{O/S 412 bases} - 10,000 \\ \text{O/S 412 bases} &= 330,000\end{aligned}$$

The remaining amortization period for a plan set up at 01/01/77 would be 20 years at 01/01/87. The end of year amortization payment for this base is

$$330,000 \div a_{\overline{20}|.07} = 31,150.$$

To set up the MFSA for 1987, you have to calculate the normal cost:

$$\begin{aligned}\text{PVNC} &= \text{PVFB} - \text{AAV} - \text{UAL} \\ &= 1,000,000 - 160,000 - 320,000 \\ &= 520,000 \\ \text{NC} &= 520,000 \div (7,000,000 \div 700,000) \\ &= 52,000 \text{ at } 01/01/87\end{aligned}$$

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Problem 3 - Page 2

Minimum Funding Standards Account for 1987

<u>Charges</u>		<u>Credits</u>	
Normal cost	1.07(52,000)	Credit balance	10,000(1.07)
CHG amort 12/31	31,150	Min contrib 12/31	x
	<hr/>		<hr/>
	86,790		10,700+x

The minimum contribution required under 412 is one that results in a zero credit balance:

$$86,790 = 10,700 + x \qquad x = 76,090$$

Note that the Full Funding Limitation should be checked:

$$\begin{aligned} \text{FFL} &= 1.07(\text{EAN AL} + \text{EANC} - (\text{lesser MVA, AAV} - \text{CB})) \\ &= 1.07 (480,000 + 50,000 - (160,000 - 10,000)) \\ &= 1.07 (380,000) = 406,600 \end{aligned}$$

This is much greater than the minimum contribution, so the FFL does not apply, and there is no FFL credit in the MFSA.

answer is D

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Problem 4

When the interest rate is changed, it is necessary to recalculate the annual amortization payment, as well as to calculate a new amortization base. This is true both under 404 maximum and 412 minimum contribution calculations. For Section 404 calculations, the new amortization base is calculated as the difference in the Accrued Liability due to the change in interest rate (see 1.404(a)-14(g)(2)). For minimum funding purposes, the new base is calculated as the difference in the "unfunded past service liability" due to the change in interest rate (see 1.412(b)-1(c)). For minimum funding purposes, the amortization period is simply the remaining number of years for each base.

We should have a single 412 amortization base that represents the Initial Accrued Liability at 01/01/80. The amount of the outstanding base can be calculated with the standard formula for reasonable funding methods (with a past service liability)

UAL = O/S 412 bases - credit balance
 425,000 = O/S base - 10,000
 O/S base = 435,000 at 01/01/87 at 6% interest rate

end of year amortization payment = $435,000 \div a_{\overline{23}|.07} = 38,591$

The new base due to the change in interest rate is $325,000 - 425,000$, or a 100,000 credit base. This base is amortized over 30 years, since the valuation date is prior to 1-1-88 (use 10 years to amortize changes in actuarial assumptions after 1987). The end of year amortization payment is

$100,000 \div a_{\overline{30}|.07} = 8,059$

Minimum Funding Standards Account for 1987

<u>Charges</u>		<u>Credits</u>	
Normal cost	1.07(50,000)	Credit balance	10,000(1.07)
IAL amort 12/31	38,591	Min contrib 12/31	x
		CHG amort 12/31	8,059
	92,091		18,759+x

The minimum contribution required under 412 is one that results in a zero credit balance:

$$92,091 = 18,759 + x \qquad x = 73,332$$

answer is C

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Problem 5

The change in plan benefits at 01/01/85 is subject to phase-ins at the DOPT of 06/30/87. The new benefits have been in effect for two full years at DOPT. Smith is a substantial owner who is subject to the 30 year phase in rules. Brown is subject to the 5 year phase in rules. For the 30 year phase in, the original plan has been in effect for 19 full years, from 01/01/68 to 01/01/87.

In calculating the guaranteed benefit, remember that changes in vesting schedule, normal retirement age, and normal form of annuity payment are all considered as changes in benefit amount that are subject to the phase in rules. In this problem, both employees are 100% vested, which simplifies the calculations. Guaranteed benefits are based on the vested benefits of the plan participants.

	SMITH	BROWN
Past service at DOPT	27.50	3.50
Benefit - 01/01/68 plan	27.5% (50,000) 13,750	3.5% (22,000) 770
Benefit - 01/01/85 plan	41.25% (50,000) 20,625	5.25% (22,000) 1,155
Guaranteeable benefit increase	6,875 572.92/mo	385 32.08/mo
Guaranteed Portion - original	13,750 * (19/30) 8,708.33	770 (100%)
Guaranteed Portion - increase	6,875 * (2/30) 458.33	greater of \$40 or 40% => 32.08/mo (can not exceed total increase)
Total guaranteed benefit	9,166.66	1,155.00
The total guaranteed benefit is 9,166.66 + 1,155.00 = 10,321.66		

answer is C

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Problem 6

Under the Aggregate method, there are usually no 412 amortization bases. The only exceptions would be amortization of waivers and shortfall gains or losses. This problem is an easy one, since there is really nothing hidden. The only real work is to calculate the amortization for the waiver. For waivers prior to 1988, a 15 year amortization period should be used (use 5 years for waivers after 1987). One of the general conditions of the exam states that the interest rate used to calculate the amortization of a waiver should be based on the valuation interest rate - this is different than the provisions in 412.

end of year amortization for 50,000 waiver = $50,000 \div a \overline{15} \overline{1.07} = 5,490$

Under the Aggregate method, you must use the Entry Age Normal method to set up the Accrued Liability and Normal Cost for the Full Funding Limitation.

$$\begin{aligned} \text{FFL} &= 1.07(\text{EAN AL} + \text{EANC} - (\text{lesser MVA, AAV} - \text{CB})) \\ &= 1.07 (780,000 + 50,000 - (800,000 - 0)) \\ &= 1.07 (30,000) = 32,100 \end{aligned}$$

Accumulated Funding Deficiency based on zero contribution and zero credit balance = $1.07(60,000) + 5,490 = 69,690$

$$\text{FFL credit} = \text{excess of AFD over FFL} = 69,690 - 32,100 = 37,590$$

answer is D

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Problem 7

This problem required some extremely detailed knowledge of the PBGC regulations. The method to be used to allocate excess assets based on employee contributions to each individual first requires the determination of the excess assets in total that are attributable to Priority Category two:

$$\text{Total residual due to PC2} = \frac{(\text{Total residual})(\text{Total liability in PC2})}{(\text{Liability in PC2 through PC6})}$$

Then the portion allocated to an individual is based on the portion of PC2 for that individual:

$$\text{Individual excess} = \frac{(\text{Total residual due to PC2})(\text{Individual PC2 liability})}{(\text{Total PC2 liability})}$$

	SMITH	BROWN	TOTAL	
PC1 liability	0	3,000	3,000	
PC2 liability	6,000	20,000	26,000	←
PC3 thru PC6	2,000	57,000	59,000	used for total residual assets
Total PC2 - PC6	8,000	77,000	85,000	←
Total PC1 - PC6	8,000	80,000	88,000	

Market value of assets = 200,000

$$\begin{aligned} \text{Residual} &= 200,000 - 88,000 \\ &= 112,000 \end{aligned}$$

$$\begin{aligned} \text{Total residual due to PC2} &= 112,000 \left(\frac{26,000}{85,000} \right) \\ &= 34,259 \end{aligned}$$

$$\begin{aligned} \text{Brown's share of residual} &= 34,259 \left(\frac{20,000}{26,000} \right) \\ &= 26,353 \end{aligned}$$

answer is C

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Problem 8

I. FALSE

The reasonable funding methods regulation contains the definition of the Projected Unit Credit cost method. At 1.412(c)(3)-1(e)(3) is a discussion of allocation of liabilities under Unit Credit methods. "This allocation must be in proportion to the applicable rates of benefit accrual under the plan. ... An allocation based on compensation is not permitted."

II. FALSE

In the reasonable funding methods regulation at 1.412(c)(3)-1(f)(1), the general rule is that ancillary benefit costs must be valued under the same method used to value retirement benefits. Paragraph (f)(4) provides an exception for use of one-year term. Ancillary benefits are defined as those that occur due to an event which is detrimental to the participant's health. It should be clear that early retirement is NOT an ancillary benefit, and can never be valued using one-year term.

III. FALSE

In the reasonable funding methods regulation at 1.412(c)(3)-1(d)(1), the general rule is that a valuation may not take benefit increases after the end of the plan year into account. There is a specific exclusion for collectively bargained plans, as long as the valuation consistently takes scheduled increases into account.

answer is A

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Problem 9

Under the Aggregate method, there are usually no 412 amortization bases. The only exceptions would be amortization of waivers and shortfall gains or losses. In this problem a waiver has been granted for 1987. The amount of the credit balance at 12/31/87 is not given. It is reasonable to assume that any credit balance at 01/01/87 would be absorbed during the year, and the remaining required contribution was the amount that was waived.

For waivers granted prior to 1988, a 15 year amortization period should be used (use 5 years for waivers after 1987). One of the general conditions of the exam states that the interest rate used to calculate the amortization of a waiver should be based on the valuation interest rate. In this problem you are told to calculate the amortization based on 8% interest.

end of year amortization for 20,000 waiver = $20,000 \div a \overline{15}|.08 = 2,337$

Under the Aggregate method, you must use the Entry Age Normal method to set up the Accrued Liability and Normal Cost for the Full Funding Limitation. Since you have insufficient information, the FFL must be ignored.

To set up the MFSA for 1988, you have to calculate the normal cost:

$$\begin{aligned} \text{PVNC} &= \text{PVFB} - \text{AAV} - \text{O/S 412 bases} + \text{credit balance} \\ &= 400,000 - 200,000 - 20,000 + 0 \\ &= 180,000 \\ \text{PVE/E} &= 1,700,000 \div 250,000 = 6.800 \\ \text{NC} &= 180,000 \div 6.800 \\ &= 26,471 \text{ at } 01/01/88 \end{aligned}$$

Minimum Funding Standards Account for 1988

<u>Charges</u>		<u>Credits</u>	
Normal cost	1.07(26,471)	Credit balance	0
Waiver amort 12/31	2,337	Min contrib 12/31	x
	30,660		x

The minimum contribution required under 412 is one that results in a zero credit balance:

$$30,660 = x$$

answer is B

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Problem 10

I. TRUE

The asset valuation regulation at 1.412(c)(2)-1(a)(3) states that money purchase pension plans must value assets at fair market value. In any individual account plan, it is necessary that the sum of the accounts equal the market value of assets.

II. FALSE

The asset valuation regulation at 1.412(c)(2)-1(b)(5) states that an asset valuation method should not be "designed to produce a result which will be consistently above or below" fair market value (or average value). This method clearly gives an asset value that always exceeds market value of assets, and that is unacceptable.

III. FALSE

The asset valuation regulation at 1.412(c)(2)-1(b)(6) states that the lower corridor for allowable asset values is the lesser of 80% of market value or 85% of average value. It is possible that 85% of average value can be less than 80% of market value, so this part is false.

answer is E

Note that the Pension Protection Act eliminated both the election to hold bonds at amortized value, as well as the use of the 85% to 115% corridor based on average value of assets for non - multiemployer plans (see Act Section 9303(c) and 9303(d)(1)).

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Problem 11

Under SEPPAA, the employer liability to the PBGC consisted of the sum of (i) the present value of unfunded guaranteed benefits, or if less, 30% of net worth, plus (ii) 75% of the present value of unfunded guaranteed benefits less 30% of net worth. There was an equally complex formula for the employer's liability to the Section 4049 trust.

You must perform an asset allocation by category to determine the unfunded guaranteed benefits in this problem. The guaranteed benefits usually consist of everything through Priority Category 4. For Smith, the PC3 benefit is greater than the guaranteed benefit, and the total liability is in PC3.

Priority Category	SMITH	BROWN	TOTAL
3	26,500	0	26,500
4	0	16,000	16,000
5+6	0	2,000	2,000
total	26,500	18,000	44,500

Since assets are allocated based on priority categories, Smith is 100% covered, and Brown gets the remaining assets:

PV Guaranteed Bens	25,500	16,000	41,500
Allocated Assets	26,500	8,500	35,000
Unfunded Guar. Bens	0	7,500	7,500

$$30\% \text{ of net worth} = .30(16,000) = 4,800$$

Now plug the values of 30% N.W. and PV UFGB into the formula above:

$$\begin{array}{rcl} \text{(i) lesser of 7,500 or 4,800} & = & 4,800 \\ \text{(ii) } 75\%(7,500) - 4,800 & = & 825 \\ & \hline & & 5,625 \end{array}$$

answer is B

The Pension Protection Act of 1987 changed the definition of the employer liability. Now the employer is liable to the participants for the outstanding benefit liabilities. This equals all benefit liability through Priority Category 6, less any benefits the PBGC may pay with plan assets. The employer liability to the PBGC equals the present value of unfunded guaranteed benefits, which is the present value of guaranteed benefits less assets allocable to guaranteed benefits. The Section 4049 trust has been eliminated, and the PBGC will collect the employer liability. The PBGC will pay all benefits to participants. The PBGC still has a lien of up to 30% of the employer's net worth.

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Problem 12 - Page 1

When the Alternative Minimum Funding Standards Account (AMFSA) is used, the regular MFSA must be maintained. When it becomes necessary to switch back to the regular MFSA, there will be a debit balance in that account. This is offset by a credit under 412(b)(3)(D), and that amount is set up as a 412 base under 412(b)(2)(D) and amortized over 5 years.

The operation of the AMFSA is clearer under the 12/82 proposed regulation than it is in 412(g). The AMFSA can only be used by plans under the Entry Age Normal method. The charges to the AMFSA include:

- (i) the lesser of the EANC or the unit credit normal cost, plus
- (ii) the excess (if any) of the UC AL over the market value of assets, plus
- (iii) the prior year's AMFSA credit balance.

The reason for the last item is that the assets include any contributions in excess of the minimum, and this extra charge prevents the contribution from being counted twice.

Alternative Minimum Funding Standards Account for 1986

<u>Charges</u>			<u>Credits</u>		
Normal cost	12/31	40,000	Credit balance		0
UC AL - MVA	12/31	0	Min contrib 12/31		x
		40,000			x

The contribution paid for 1986 under the AMFSA is 40,000 at 12/31/86. Now the regular MFSA must be set up for 1986. The unknown item is the amortization charge for the initial accrued liability. We can apply the standard formula of $UAL = O/S \text{ 412 bases} - \text{credit balance}$:

$$UAL = \text{Accrued Liability} - \text{Actuarial assets} = 700,000 - 480,000$$

$$220,000 = \ddot{a}_{251.07}(\text{IAL} \div \ddot{a}_{301.07})$$

The amortization payment for the IAL has to be calculated using $\ddot{a}_{301.07}$ because this is an end of year valuation. The final payment is

$$220,000 \div 12.4693 = 17,643.$$

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Problem 12 - Page 2

Minimum Funding Standards Account for 1986

<u>Charges</u>			<u>Credits</u>	
Normal cost	12/31	50,000	Credit balance	0
IAL amort	12/31	17,643	AMFSA contrib 12/31	40,000
<hr/>			<hr/>	
67,643			40,000	

As expected, there is a debit balance of 27,643 at 12/31/86 in the MFSA. Now do the regular MFSA for 1987 allowing for the switch back from the AMFSA. The 27,643 is set up as a new amortization base, and the end of year amortization payment over 5 years is

$$27,643 \div a_{\overline{5}|1.07} = 27,643 \div 4.1002 = 6,742.$$

It was necessary to use an end of year amortization factor because the switch back base is calculated at 01/01/87.

Minimum Funding Standards Account for 1987

<u>Charges</u>			<u>Credits</u>	
Debit balance	1.07(27,643)		Credit balance	0
Normal cost	12/31	60,000		
IAL amort	12/31	17,643	412(b)(3)(D) credit 27,643(1.07)	
AMFSA amort	12/31	6,742	min contrib 12/31	x
<hr/>			<hr/>	
113,963			29,578+x	

The required minimum contribution is $113,963 - 29,578 = 84,385$.

answer is C

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Problem 13 - Page 1

This problem requires calculations under both 404 and 412. The key to the problem is that the calculation of the normal cost under 412 must satisfy the general rule in the reasonable funding methods regulation at 1.412(c)(3)-1):

$$\text{PV Future Normal costs} = \text{PV Future Benefits} - \text{Actuarial Assets} - \text{O/S 412 amortization bases} + \text{credit balance}$$

Under the aggregate method, there are normally no 412 amortization bases. Many people think of reducing the actuarial value of assets by the credit balance, which gives the same results as the formula above.

Normal cost = 10% compensation

$$\text{NC} = .10 (1,800,000) = 180,000$$

Minimum Funding Standards Account for 1987

<u>Charges</u>		<u>Credits</u>	
Normal cost	180,000 (1.07)	Credit balance	100,000 (1.07)
		min contrib 1/1	x (1.07)
	<hr/>		<hr/>
	180,000 (1.07)		(100,000 + x) 1.07

$180,000(1.07) = (100,000+x)(1.07)$ results in credit balance of zero.
The required minimum contribution at 01/01/87 is 80,000.

Section 404 deductible limit calculations

412 Normal cost = 10% compensation => PVNC = 10% PV future compensation
Section 412 PVNC = .10 (15,000,000) = 1,500,000

Section 412 PVNC = PV Future Benefits - Actuarial Assets + CB

$$1,500,000 = \text{PVFB} - 1,100,000 + 100,000$$

$$\text{PVFB} = 2,500,000$$

Section 404 PVNC = PV Future Benefits - Actuarial Assets
= 2,500,000 - 1,100,000
= 1,400,000

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Problem 13 - Page 2

$$\text{PV Future Earnings} \div \text{Earnings} = 15,000,000 \div 1,800,000 \\ = 8.3333$$

$$\text{Section 404 Normal Cost} = 1,400,000 \div 8.3333 = 168,000 \text{ at } 01/01/87$$

Limit adjustments = 0 since no bases under Aggregate method

Deductible limit is adjusted with interest to earlier of end of the plan year, or end of the tax year: $1.07 (168,000) = 179,760$. This amount can be paid at any date. The difference between the deductible limit and the minimum contribution at 01/01/87 is $179,760 - 80,000 = 99,760$.

answer is C

One thing to note about this problem is that the deductible limit under 404 is less than the normal cost for 412. If the deductible limit is paid each year, the credit balance will be reduced slowly. This is the result of the different normal cost under 404 and 412.

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Problem 14 - Page 1

This is mainly a benefit calculation problem. With a salary scale, you must be careful to project earnings to the correct age. For retirement age of 65, you should project earnings to age 64. This is the last year of earnings included in the final average earnings calculation at age 65.

The final average earnings will be calculated as follows:

1. project earnings to age 64
2. multiply age 64 earnings by $\frac{57.07}{5} = .8774$

The first step is to calculate the basic plan benefits:

	SMITH	BROWN	GREEN
1-1-87 age	60	50	50
Last year's pay	7,500	20,000	42,000
Age 64 proj factor	1.07 ⁵	1.07 ¹⁰	1.07 ¹⁰
Age 64 pay	10,519	55,181	115,879
5 yr FAE (.8774)	9,230	48,418	101,677
Age at hire	25	25	35
Service at 65	40	40	30
3% times service	120%	120%	90%
Benefit at 65	11,076	58,102	91,509

Next, the 415 limits must be applied. Since all three participants were born prior to 1938, the limits for a Social Security Retirement Age of 65 are used. This produces a dollar maximum of 90,000 at age 65. (This increased to 94,023 in 1988.)

The limit is defined as the lesser of 90,000 or 100% of 3 year FAE. The application of the 415 limits can not reduce the benefit below 10,000. The dollar maximum would be reduced pro-rata for less than 10 years of participation service. The other two limits would be reduced pro-rata for less than 10 years of service from hire. These reductions do not come into play in this problem.

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Problem 14 - Page 2

For IRC Section 415 limits, a 3 year final average earnings must be calculated. The factor to multiply age 64 earnings by is
 $\frac{31.07}{3} = .9360$

	SMITH	BROWN	GREEN
100% 3 yr FAE (.9360)	9,846	51,650	108,463
lesser of FAE3,			
or 90,000 maximum	9,846	51,650	90,000
10,000 minimum	10,000	51,650	90,000
Lesser of plan ben,			
or 415 maximum	10,000	51,650	90,000

Total projected benefit for all three is 151,650.

answer is B

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Revised
10/01/95

Problem 15

This problem requires knowledge of a very fine point, which is that the first year of the three year testing period is considered as the year of withdrawal in a partial withdrawal calculation. The problem states that a partial withdrawal occurred at 12/31/87. Based on this, the three year test period is 1985 to 1987. The base units for the "high base year" is the average of the two highest years in the preceding five year period, which equals $\frac{1}{2}(600,000+500,000) = 550,000$. 30% of the units for the "high base year" equals $.30(550,000) = 165,000$, and the units for each year in the three year testing period are less than 165,000.

To calculate the partial withdrawal liability, a fraction is applied to the withdrawal liability that would otherwise be calculated. Under the Direct Attribution method, Employer A's share of the Unfunded Vested Benefits is 325,000 at 12/31/84. You must use the first year of the three year testing period, since this is a partial withdrawal liability calculation. The de minimis amount is the lesser of 50,000 or .75% of the plan's UVB = lesser of (50,000 or $.0075(4,500,000)$) = 33,750. The deductible is this amount reduced by the excess of the employer's share of the UVB over 100,000. Since the excess is 225,000, the deductible is zero.

The withdrawal liability for employer A would be 325,000, as calculated above. Now a fraction must be applied, which is one minus the ratio of (i) the base units for the plan year following the plan year of partial withdrawal to (ii) the average base units during the five year period preceding the three year testing period:

$$\begin{aligned} & 325,000 (1 - 75,000 \div [.20(600,000+500,000+400,000+300,000+200,000)]) = \\ & 325,000 (1 - 75,000 \div 400,000) = \\ & 325,000 (.8125) = 264,063 \end{aligned}$$

answer is D

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Problem 16 - Page 1

This problem asks for the deductible limit for 1987. Since PUC is an individual cost method, you must calculate the experience G/L for 1986. It is possible to check the Full Funding Limitation, since the contribution of 100,000 at 12/31/86 must be the total assets. For a newly established plan, the FFL is so large that it will not apply.

The initial Accrued Liability at 01/01/86 is 1,000,000. The expected UAL at 01/01/87 is calculated using the standard formula:

$$\begin{aligned} eUAL_1 &= (1+i)(UAL_0 + NC_0) - (\text{Contribution} + \text{interest}) \\ eUAL_1 &= 1.07(1,000,000 + 100,000) - 100,000 \\ &= 1,077,000 \end{aligned}$$

The experience loss for 1986 is equal to the UAL minus the $eUAL$:

$$\begin{aligned} UAL &= 1,400,000 - 100,000 = 1,300,000 \\ \text{LOSS} &= 1,300,000 - 1,077,000 = 223,000 \end{aligned}$$

The limit adjustments equal ten year amortization of the IAL and the experience loss. The deductible limit equals the normal cost plus the limit adjustments, adjusted with interest to the earlier of the end of the plan year or the end of the tax year. Since we have no information on the tax year, adjust to the end of the plan year:

$$\begin{aligned} \text{Deductible Limit} &= 1.07 \left(120,000 + \frac{(1,000,000 + 223,000)}{\ddot{a}_{\overline{10}|1.07}} \right) \\ &= 1.07 \left(120,000 + 162,736 \right) = 302,528 \end{aligned}$$

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Problem 16 - Page 2

It is also necessary to calculate the minimum funding requirement. This becomes clear when you realize that the contribution of 100,000 for 1986 only covers the normal cost, and a funding deficiency exists at 01/01/87. The problem does not say that a waiver is granted, so the funding deficiency plus interest is paid off as part of the minimum contribution for 1987.

The 412 amortization payment for the IAL is 80,586, calculated as

$$1,000,000 \div a_{\overline{30}|1.07} = 1,000,000 \div 12.4090$$

Based on the contribution of 100,000 for 1986, you can determine the funding deficiency for 1986:

Minimum Funding Standards Account for 1986

<u>Charges</u>			<u>Credits</u>		
Normal cost		100,000(1.07)	Credit balance		0
IAL amort	12/31	80,586	contribution 12/31	100,000	
		<hr/>		<hr/>	
		187,586			100,000

The deficiency at 12/31/86 is 187,586 - 100,000, or 87,586. As noted above, this deficiency will be paid off during 1987. The experience loss during 1986 was previously calculated as 223,000. The amortization period for the experience loss is 15 years, since the loss occurred before 1988. The end of year amortization payment is

$$223,000 \div a_{\overline{15}|1.07} = 223,000 \div 9.1079 = 24,484.$$

Minimum Funding Standards Account for 1987

<u>Charges</u>			<u>Credits</u>		
Debit balance		87,586(1.07)	Credit balance		0
Normal cost		120,000(1.07)			
IAL amort	12/31	80,586			
Loss amort	12/31	24,484	min contrib 12/31		x
		<hr/>		<hr/>	
		327,187			x

The required minimum contribution is 327,187. Since the contribution required under 412 exceeds the otherwise calculated deductible limit, the deductible limit equals 327,187. Note that the FFL is 1,519,400 = 1.07(1,400,000+120,000-100,000), and it does not apply.

answer is E

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Problem 17 - Page 1

This problem can be shortcut by realizing that the effect of payment of the deductible limit at year end is to decrease the UAL based on a ten year amortization. The change in assumptions at 01/01/87 must be handled separately, but the effect is the same. If this had been an Individual cost method, information about experience gains and losses would be necessary to work the problem.

At 01/01/86, the UAL equals the Initial Accrued Liability of 100,000. At 01/01/87, the UAL can be calculated as

$$100,000 (a_{\overline{09}|.07} \div a_{\overline{10}|.07}) = 92,762.$$

The change in assumptions at 01/01/87 increases the UAL by 30%, which produces a new ten year amortization base of $.30(92,762) = 27,829$. This base is also a new layer of UAL, and it will be paid off over ten years. The 01/01/88 UAL is calculated in a similar manner as the 01/01/87 UAL:

$$100,000 (a_{\overline{08}|.07} \div a_{\overline{10}|.07}) + 27,829 (a_{\overline{09}|.07} \div a_{\overline{10}|.07}) = 85,018 + 25,815 = 110,832.$$

The direct method of calculating the credit balance at 12/31/87 relies on the relationship between the UAL, the Section 412 amortization bases, and the credit balance: $UAL = O/S \text{ 412 bases} - \text{credit balance}$. The outstanding 412 bases can be written down based on 30 year amortization instead of 10 year amortization:

$$100,000 (a_{\overline{28}|.07} \div a_{\overline{30}|.07}) + 27,829 (a_{\overline{29}|.07} \div a_{\overline{30}|.07}) = 97,809 + 27,534 = 125,343.$$

The credit balance is $125,343 - 110,832 = 14,510$.

answer is D

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Problem 17 - Page 2

Another way to work this problem is to calculate the difference between the maximum and minimum contribution each year. If the minimum contribution is paid each year, the credit balance would be zero. Any extra contribution creates the credit balance:

$$\begin{aligned} 1986 \text{ Deductible limit} &= 1.07(\text{normal cost}) + 100,000 \div a_{\overline{10}|1.07} \\ &= 1.07(\text{normal cost}) + 14,238 \end{aligned}$$

$$\begin{aligned} 1986 \text{ Minimum contrib} &= 1.07(\text{normal cost}) + 100,000 \div a_{\overline{30}|1.07} \\ &= 1.07(\text{normal cost}) + 8,059 \end{aligned}$$

$$\text{Credit balance at 12/31/86} = 14,238 - 8,059 = 6,179.$$

$$\begin{aligned} \text{UAL} &= 1.07(\text{normal cost} + 100,000) - (\text{contribution} + \text{interest}) \\ &= 1.07(\text{normal cost}) + 107,000 - 1.07(\text{normal cost}) - 14,238 \\ &= 92,762 \end{aligned}$$

$$\text{Increase due to assumption change} = .30(92,762) = 27,829$$

$$\begin{aligned} 1987 \text{ Deductible limit} &= 1.07(\text{normal cost}) + 14,238 + 27,829 \div a_{\overline{10}|1.07} \\ &= 1.07(\text{normal cost}) + 14,238 + 3,962 \end{aligned}$$

$$\begin{aligned} 1987 \text{ Minimum contrib} &= 1.07(\text{normal cost}) + 8,059 + 27,829 \div a_{\overline{30}|1.07} \\ &= 1.07(\text{normal cost}) + 8,059 + 2,243 \end{aligned}$$

$$\begin{aligned} \text{Credit balance at 12/31/87} &= 1.07(6,179) + 14,238 + 3,962 - (8,059 + 2,243) \\ &= 14,510 \end{aligned}$$

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Problem 18 - Page 1

In this problem you are given the Entry Age Normal valuation results, which can not be used to check the Full Funding Limitation, since you are not given the market value of assets. Revenue Procedure 85-29 contains the rules for setting up a new amortization base when there is a change in cost method. The amortization period is the greater of the remaining period for amortizing the initial accrued liability, or the lesser of (i) 15 years, or (ii) the average future working lifetime of the active population.

The amount of the amortization base must satisfy the formulas that are applicable to all reasonable funding methods (1.412(c)(3)-1):

$$\text{PV Future Normal costs} = \text{PV Future Benefits} - \text{Actuarial Assets} - \text{O/S 412 amortization bases} + \text{credit balance}$$

For cost methods with Unfunded Actuarial Liabilities, this can be restated as $\text{UAL} = \text{O/S 412 bases} - \text{credit balance}$. Since this plan was valued under the Attained Age Normal method prior to 1987, the only 412 amortization base prior to the method change is the one for the Initial Accrued Liability. Since this plan was established after the effective date of ERISA, the MFSA for this plan was established at 1-1-75. The end of year amortization payment is

$$120,000 \div a_{\overline{30}|.07} = 9,670.$$

The effect of the change in funding method is to establish a new amortization base that is equal to the difference between the UAL under the AAN method and the FIL method. The outstanding 412 amortization base is based on the 18 years remaining ($30 - (1987 - 1975) = 18$):

$$9,670 \times a_{\overline{18}|.07} = 97,275.$$

Now you can calculate the UAL under the AAN method as

$$\begin{aligned} \text{AAN UAL} &= \text{O/S 412 bases} - \text{CB} \\ &= 97,275 - 60,000 = 37,275. \end{aligned}$$

Under the FIL method, the UAL in the first year is set up based on the EAN method:

$$\begin{aligned} \text{FIL UAL} &= \text{EAN UAL} = \text{EAN AL} - \text{AAV} \\ &= 2,600,000 - 1,700,000 = 900,000. \end{aligned}$$

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Problem 18 - Page 2

The new amortization base for the change in cost method is the change in UAL under the two methods: $900,000 - 37,275 = 862,725$. Based on the rule in RP 85-29, this base should be amortized over 18 years, or if greater, the average working lifetime of the population. You can not determine the average working lifetime, so assume that it is less than 18 years:

$$862,725 \div 10.07 = 85,766.$$

Minimum Funding Standards Account for 1987

<u>Charges</u>		<u>Credits</u>	
Normal cost	1.07(130,000)	Credit balance	60,000(1.07)
IAL amort 12/31	9,670		
CHG amort 12/31	85,766	Min contrib 12/31	x
	<hr/>		<hr/>
	234,536		64,200+x

The minimum contribution required under 412 is one that results in a zero credit balance:

$$234,536 = 64,200 + x \quad x = 170,336$$

Note that the Full Funding Limitation should be checked:

$$\begin{aligned} \text{FFL} &= 1.07(\text{EAN AL} + \text{EANC} - (\text{lesser MVA, AAV} - \text{CB})) \\ &= 1.07 (480,000 + 50,000 - (160,000 - 10,000)) \\ &= 1.07 (380,000) = 406,600 \end{aligned}$$

This is much greater than the minimum contribution, so the FFL does not apply, and there is no FFL credit in the MFSA.

answer is E

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Problem 19 - Page 1

Under any individual cost method, there are always two things to look for: (i) gains and losses, and (ii) the Full Funding Limitation. Since you are told that the actuarial value of assets equals the market value, it is possible to calculate the FFL each year. In 1986, a 10,000 contribution is paid, which is less than the normal cost. With a zero UAL, it is likely that the FFL applied.

$$\begin{aligned} \text{FFL} &= 1.07(\text{EAN AL} + \text{EANC} - (\text{lesser MVA, AAV} - \text{CB})) \\ &= 1.07 (2,160,000 + 58,000 - (2,200,000 - 30,000)) \\ &= 1.07 (48,000) = 51,360 \end{aligned}$$

Accumulated Funding Deficiency based on zero contribution and zero credit balance = $1.07(58,000 \text{ normal cost} + 12,000 \text{ amort}) = 74,900$.
 FFL credit = excess of AFD over FFL = $74,900 - 51,360 = 23,540$.

Minimum Funding Standards Account for 1986

<u>Charges</u>		<u>Credits</u>	
Normal cost	1.07(58,000)	Credit balance	30,000(1.07)
Net amort	1.07(12,000)	FFL credit 12/31	23,540
		Contrib pd 12/31	10,000
	74,900		65,640

At 12/31/86, the funding deficiency is $74,900 - 65,640 = 9,260$. Since you are not told that a waiver was granted, you must assume that the deficiency is paid off during 1987. In the 01/01/87 valuation, there is a hidden twist - an amortization base must be set up for any experience gain or loss.

Since the UAL is non-zero at 01/01/87, there has been an experience loss. The usual formula for the amount of the loss would be $eUAL_1 - UAL_1$. Since last year's UAL was actually less than zero, the calculation of the eUAL may be tricky. Revenue Ruling 81-213 clearly states that the actual UAL "is the excess, if any, of the accrued liability over the actuarial value of assets". The definition of the expected UAL starts with the actual UAL of the prior year:

$$\begin{aligned} eUAL &= 1.07(0 + 58,000) - 10,000 = 52,060 \\ UAL &= 2,410,000 - 2,375,000 = 35,000. \end{aligned}$$

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10/27/88

Problem 19 - Page 2

If you used these values, it appears that an experience GAIN occurred during 1986. This does not make any sense. There is a way out of this contradiction. The effect of the application of the FFL is that all prior Section 412 amortization bases are eliminated at 01/01/87. This means that the theoretical equation of balance in the reasonable funding methods regulation is no longer satisfied:

$$UAL = 35,000 \quad \text{does not equal} \quad O/S \text{ 412 bases} - CB = 0 + 9,260 \text{ DB}$$

Section 7 of RR 81-213 defines a "Special G/L" calculation which establishes an amortization base that forces the theoretical equation of balance to hold. Section 7 of RR 81-213 states that you can do a special determination of the G/L only when an experience loss has occurred. The proposed regulation at 1.412(b)-1(f)(2)(ii) contains basically the same rule, except that it does not require a loss to have occurred. Since that regulation is more recent than RR 81-213, you can use it to work this problem:

$$\begin{aligned} UAL &= O/S \text{ 412 bases} - CB \\ 35,000 &= LOSS + 9,260 \text{ debit balance} \\ LOSS &= 35,000 - 9,260 = 25,740 \\ \text{end of year amortization payment} &= 25,740 \div 15 = 1,716 \end{aligned}$$

The amortization is based on 15 years, since the loss occurred before 1988. Now the 1987 MFSA can be set up; first you must check the FFL:

$$\begin{aligned} FFL &= 1.07 (EAN \text{ AL} + EANC - (\text{lesser MVA, AAV} - CB)) \\ &= 1.07 (2,410,000 + 62,000 - (2,375,000 - 0)) \\ &= 1.07 (97,000) = 103,790 \end{aligned}$$

The FFL definition above does NOT treat the debit balance as a negative credit balance. See the solution to problem 1 for further explanation. The Accumulated Funding Deficiency based on zero contribution and zero credit balance = $1.07(62,000 \text{ normal cost} + 2,826 \text{ amort}) = 69,364$. Since the AFD is less than the FFL, the FFL does not apply.

Minimum Funding Standards Account for 1987

<u>Charges</u>		<u>Credits</u>	
Debit balance	1.07(9,260)	Credit balance	0
Normal cost	1.07(62,000)		
Loss amort 12/31	2,826	Min contrib 12/31	x
	<hr/>		<hr/>
	79,074		x

The minimum contribution for 1987 is 79,074.

answer is D

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Problem 20 - Page 1

Under any individual cost method, there are always two things to look for: (i) gains and losses, and (ii) the Full Funding Limitation. Since 01/01/86 is the year of plan inception, the Full Funding limit will not apply. It is unlikely that it will apply at 01/01/87, but you can still check it, since the contribution at 12/31/86 constitutes all of the assets of the plan.

You are told that 2,000 of the minimum funding requirement for 1986 is waived. This probably means that there will also be a debit balance in the MFSA at 12/31/86. You should assume that the portion of the funding deficiency that is not waived is paid off during 1987. The first step is to set up the MFSA for 1986. To do this, you must calculate the amortization payment for the initial accrued liability:

$$\text{end of year amortization payment} = 80,000 \div a_{\overline{30}|1.07} = 6,447$$

Minimum Funding Standards Account for 1986

<u>Charges</u>		<u>Credits</u>	
Normal cost	1.07(7,000)	Credit balance	0
IAL amort 12/31	6,447	Contrib pd 12/31	10,000
	13,937		10,000

The debit balance at 12/31/86 is 3,937. This can be verified by comparing the expected UAL to the O/S 412 amortization bases:

$$eUAL = 1.07(80,000 + 7,000) - 10,000 = 83,090$$

$$O/S \ 412 \ \text{bases} = 80,000 (a_{\overline{29}|1.07} \div a_{\overline{30}|1.07}) = 79,153$$

$$UAL = O/S \ 412 \ \text{bases} - CB$$

$$CB = O/S \ 412 \ \text{bases} - UAL = 79,153 - 83,090 = -3,937 \ (\text{debit balance})$$

1987 Section 412 minimum contribution calculations

The experience G/L during the year is the difference between the eUAL and the actual UAL:

$$eUAL = 83,090 \text{ from above}$$

$$UAL = AL - AAV = 100,000 - 10,000$$

$$= 90,000$$

$$\text{Loss} = 90,000 - 83,090 = 6,910$$

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Problem 20 - Page 2

The experience loss is amortized over 15 years, since the loss occurred before 1988. The 2,000 waiver is also amortized over 15 years, since the waiver was granted before 1988. The combined amortization toward both pieces is 978, calculated as follows:

$$\text{end of year amortization payment} = (2,000 + 6,910) \div 15 = 978$$

Now the 1987 MFSA can be set up, but first you must check the FFL:

$$\begin{aligned} \text{FFL} &= 1.07(\text{AL} + \text{NC} - (\text{lesser MVA, AAV} - \text{CB})) \\ &= 1.07(100,000 + 12,000 - (10,000 - 0)) \\ &= 1.07(102,000) = 109,140 \end{aligned}$$

The FFL definition above does NOT treat the debit balance as a negative credit balance. See the solution to problem 1 for further explanation. The FFL is clearly greater than the amortization charges in the MFSA, so the Full Funding Limitation does not apply.

Minimum Funding Standards Account for 1987

<u>Charges</u>		<u>Credits</u>	
Debit balance	1.07(1,937)	Credit balance	0
Normal cost	1.07(12,000)		
IAL amort 12/31	6,447		
new amort 12/31	978	Ded Limit 12/31	MAX
	<hr/>		<hr/>
	22,338		MAX

Now you have to calculate the actual contribution for 1987 to determine the credit balance at 12/31/87. The minimum contribution at 12/31/87 for MFSA purposes is 22,338.

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Problem 20 - Page 3

1987 Section 404 deductible limit calculations

You are told that the deductible limit for 1987 is contributed at 12/31/87. The deductible limit includes the normal cost plus limit adjustments, but it must not exceed the Full Funding Limitation. It can not be less than the minimum funding of 22,338 shown above.

The limit adjustment would equal 10 year amortization of the initial accrued liability and the experience loss:

$$\text{Limit Adjustment} = (80,000 + 6,910) \div \ddot{a}_{\overline{10}|.07} = 11,565$$

The maximum deductible limit is the normal cost plus limit adjustment, adjusted with interest to the earlier of the end of the tax year or the end of the plan year:

$$\text{Deductible limit} = 1.07 (12,000 + 11,565) = 25,214$$

Now the Full Funding Limitation must be checked under Section 404. The Full Funding Limitation is adjusted with interest to earlier of end of the plan year, or end of the tax year. If there are any carryover contributions for 404 purposes, then the FFL under 404 is increased by the unadjusted amount of the carryover contributions (see Revenue Ruling 82-125). Since there is no credit balance, and you must assume that the tax year and the plan year are the same, the FFL is the same number under 404 as it is under 412:

$$\begin{aligned} \text{FFL} &= 1.07 (\text{AL} + \text{NC} - \text{lesser MVA, AAV}) \\ &= 1.07 (100,000 + 12,000 - 10,000) \\ &= 1.07 (102,000) = 109,140 \end{aligned}$$

The credit balance based on a contribution of 25,214 at 12/31/87 is 2,876.

answer is B

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Problem 21

This problem tests your knowledge of the Section 415 maximum benefit limits and how they are handled for participants with less than 10 years of service. The dollar limit was 90,000 in 1987, and this amount is reduced based on the ratio of years of participation service to ten years. The 100% FAE3 maximum and the 10,000 minimum are both reduced based on the ratio of years of service to ten years.

You are not told how the plan defines the accrued benefit, so you should assume the benefit accrues as it is earned. Smith is 62 years old at 01/01/87, and has 8 years of service, and 6 years of participation service.

Accrued benefit under the plan = $8(12)(\$100) = 9,600$

Section 415 dollar maximum = $90,000(6 \div 10) = 54,000$

3 year final average pay = 11,000

Section 415 100% FAE3 maximum = $11,000(8 \div 10) = 8,800$

Section 415 minimum floor = $10,000(8 \div 10) = 8,000$

Final accrued benefit = lesser of 9,600 or 8,800 or 54,000,
but not less than lesser of 9,600 and 8,000 floor
= 8,800

answer is C

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Problem 22 - Page 1

There are two difficult questions to answer in this problem: (i) should you assume that the plan will continue to be Top Heavy for all future years for purposes of the T-H minimum benefit, and (ii) how do you apply Projected Unit Credit to a plan that has two different types of benefit. The answer to the first question is apparently yes. To apply PUC to this plan, you must calculate the "funding accrued benefit" under both the base plan dollar per month benefit, and the 2% per T-H year benefit, and use the greater of the two benefits.

The reasonable funding methods regulation contains the definition of the Projected Unit Credit cost method. At 1.412(c)(3)-1(e)(3) is a discussion of allocation of liabilities under Unit Credit methods. In general, PUC requires calculation of what I call a "funding accrued benefit", which is not necessarily the same as the accrued benefit defined under the plan. The projected benefit under the plan is calculated, including a salary scale. The "funding accrued benefit" is calculated by applying a ratio, which is based on the years of benefit service at the valuation divided by such years at assumed retirement age. The years of benefit service are weighted by the rates of benefit accrual, which reproduces the benefit formula.

The PUC normal cost is calculated as the present value of the change in the accrued benefit in the year following the valuation date. Smith has ten years of service at age 40. The 1986 salary of 20,000 corresponds to salary during the age of 39.

Plan benefit calculations

Projected benefit at assumed retirement:	$6,300 = (65-30)(12)(\$15)$
Funding accrued benefit at 01/01/87:	$6,300 (10 \div 35) = 1,800$
Funding accrued benefit at 01/01/88:	$6,300 (11 \div 35) = 1,980$

(next page)

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Problem 22 - Page 2

Top Heavy minimum calculations

Projected salary at age 64: $20,000(1.05)^{25} = 67,727$
Projected salary at age 63: $67,727 \div 1.05 = 64,502$
Projected salary at age 62: $64,502 \div 1.05 = 61,430$
3 year final average pay at age 64 = 64,553

The plan has been Top Heavy for one year at 01/01/87. The plan also must be Top Heavy at 01/01/88, because both the first and second plan years use 12/31/86 as the determination date. The T-H minimum will be based on one year of T-H service at 01/01/87, and two T-H years at 01/01/88.

Projected Top Heavy minimum at retirement: $25,821 = (2\%)(20)(64,553)$
Funding accrued benefit at 01/01/87: $1,291 = 25,821(1 \times 2\%) \div (20 \times 2\%)$
Funding accrued benefit at 01/01/88: $2,582 = 25,821(2 \times 2\%) \div (20 \times 2\%)$

The final accrued benefit at 01/01/87 is the greater of 1,800 and 1,291, which is 1,291. At 01/01/88, the accrued benefit is the greater of 1,980 or 2,582, which is 2,582. The resulting normal cost is 1,441:

$$\begin{aligned}\text{Normal cost} &= (2,582 - 1,800) (\ddot{a}_{65}^{(12)}) (D_{65} \div D_{40}) \\ &= 782(10)(1.07)^{-25} = 1,441\end{aligned}$$

answer is D

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Problem 23 - Page 1

After the change to the Aggregate method, all MFSA bases will be eliminated. See Revenue Procedure 85-29 Section 4.01 for certain bases which would not normally be eliminated upon a change to the Aggregate method.

The only item missing for completion of the MFSA for 1987 is the amount of the credit balance at 12/31/86. This can be derived using the relationship $UAL = O/S\ 412\ bases - credit\ balance$. This calculation will be done using the Entry Age Normal valuation results. One area to be careful of is handling of the 1986 experience gain.

Entry Age Normal calculations

$$\begin{aligned} EAN\ UAL &= EAN\ AL - AAV = 220,000 - 50,000 = 170,000 \\ O/S\ 412\ bases &= 200,000 \left(\frac{a_{\overline{26}|.07}}{a_{\overline{30}|.07}} \right) - 3,000\ gain \\ &= 200,000 \left(\frac{11.8258}{12.4090} \right) - 3,000 = 187,599 \\ UAL &= O/S\ 412\ bases - credit\ balance \\ CB &= O/S\ 412\ bases - UAL = 187,599 - 170,000 = 17,599 \end{aligned}$$

Aggregate method calculations

$$\begin{aligned} PV\ Future\ Normal\ costs &= PV\ Future\ Benefits - Actuarial\ Assets - \\ &\quad O/S\ 412\ amortization\ bases + credit\ balance \\ &= 350,000 - 50,000 - 0 + 17,599\ CB \\ &= 317,599 \end{aligned}$$

The calculation of the PVNC is in accordance with the general rule that must be satisfied by all reasonable cost methods - see the regulation at 1.412(c)(3)-1. There are no 412 amortization bases under the Aggregate method in this problem.

$$\begin{aligned} PV\ Future\ Earnings \div Earnings &= 3,500,000 \div 400,000 \\ &= 8.7500 \\ Normal\ Cost &= 317,599 \div 8.7500 = 36,297\ at\ 01/01/87 \end{aligned}$$

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Problem 23 - Page 2

Now the 1987 MFSA can be set up, but first you must check the FFL. Since the Aggregate method does not generate an Accrued Liability, use the Entry Age Normal valuation results.

$$\begin{aligned} \text{FFL} &= 1.07 (\text{EAN AL} + \text{EANC} - (\text{lesser MVA, AAV} - \text{CB})) \\ &= 1.07 (220,000 + 15,000 - (50,000 - 17,599)) \\ &= 1.07 (202,599) = 216,781 \end{aligned}$$

The FFL is clearly greater than the amortization charges in the MFSA, so the Full Funding Limitation does not apply.

Minimum Funding Standards Account for 1987

<u>Charges</u>		<u>Credits</u>	
Normal cost	1.07(36,297)	Credit balance	17,599(1.07)
		min contrib 12/31	x
	<hr/>		<hr/>
	38,838		18,831+x

The minimum contribution required under 412 is one that results in a zero credit balance:

$$38,838 = 18,831 + x \qquad x = 20,007$$

answer is C

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Problem 24

Revenue Ruling 81-212 contains acceptable methods used to allocate Minimum Funding Standards Account items when a plan is spun off into two or more plans. Problem 31 tests the method used to allocate the credit balance upon spinoff. This problem tests the method used to allocate the outstanding amortization bases upon spinoff. Revenue Ruling 86-47 contains different rules which must be used when the market value of assets exceeds the present value of benefits on a termination basis (before the plan is spun off), and when one of the spun off plans has a zero UAL.

The method of allocation is based on the fact that, for a plan with a non-zero UAL, the outstanding 412 amortization bases less the credit balance equals the UAL. At the date of spinoff, the present value of benefits on a termination basis is used to allocate the market value of assets to the spun off plans. The Accrued Liability under the cost method is calculated for each of the plans. In this problem, you are given the allocated credit balance, and you must allocate the O/S 412 bases between the plans.

Under the FIL method, the UAL is written down each year based on the formula for the expected UAL. At plan spinoff, the Entry Age Normal accrued liability is used to develop an allocation weight. This takes the accumulated experiences gains and losses of the spun off populations into account. The EAN AL is used to allocate the sum of the UAL and AAV, which is termed the "FIL accrued liability" in the revenue ruling. The market value of assets is used to allocate the AAV between the two plans. The difference between the allocated "FIL AL" and the allocated AAV is the allocated UAL. The O/S 412 amortization bases must equal the sum of the allocated UAL and the allocated credit balance.

$$\begin{aligned}\text{UAL} &= \text{O/S 412 bases} - \text{CB} \\ &= 185,000 - 60,000 \\ &= 125,000\end{aligned}$$

$$\begin{aligned}\text{"FIL AL"} &= \text{UAL} + \text{AAV} \\ &= 125,000 + 300,000 \\ &= 425,000\end{aligned}$$

		<u>Plan A</u>	<u>Plan B</u>	<u>Plan C</u>
Given	(A) EAN AL	450,000	230,000	220,000
Allocated by (A)	(B) FIL AL	425,000	217,222	207,778
Given	(C) MVA	300,000	125,000	175,000
Allocated by (C)	(D) AAV	300,000	125,000	175,000
(B) - (D)	(E) UAL	125,000	92,222	32,778
Given	(F) CB	60,000	5,000	55,000
(E) + (F)	(G) O/S bases	185,000	97,222	87,778

answer is E

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Problem 25 - Page 1

The regulation at 1.404(a)-14(h) contains rules for maintenance of 10-year amortization bases used to calculate the deductible limit. It specifies that the O/S balance of the 10-year amortization bases must equal the UAL. The UAL under 404 is based on certain adjustments for carryover and non-deducted contributions, of which we have none in this problem.

The general rules for writing down the bases are as follows:

1. Total contribution with respect to all bases equals the difference between (i) and (ii):
 - (i) is the sum of
 - (A) the total deduction for the prior year, plus
 - (B) interest on actual contribution for the prior year, plus
 - (C) interest on the carryover at the beginning of the prior year
 - (ii) is the normal cost plus interest from the date it is calculated

Interest on the above items is at the valuation rate to the current valuation date.
2. The limit adjustment for any base is the lesser of the 10-year amortization of the base, or the outstanding balance of the base
3. The contribution with respect to a base equals the product of (i) and (ii):
 - (i) is the total contribution with respect to all bases
 - (ii) is the ratio of the limit adjustment for the base to the sum of the limit adjustments for all bases
4. The unamortized amount of any base equals (i) plus (ii) minus (iii):
 - (i) is the unamortized amount of the base at last year's valuation date
 - (ii) is interest on (i) from last year's valuation date to this year's valuation date
 - (iii) is the contribution with respect to the base

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Problem 25 - Page 2

In this problem, the initial base is written down, and a new base is established at 01/01/86 due to an experience G/L. At 1.404(a)-14(g), the regulation specifies that the G/L base is the same one set up under Section 412. The usual calculation of the G/L base is the difference between the expected UAL and the actual UAL.

From 01/01/85 to 01/01/86 there is only one base, so there is no allocation involved.

Contribution toward all bases = $100,000 - 1.07(50,000) = 46,500$
Unamortized amount of base = $1.07(350,000) - 46,500 = 328,000$

At 12-31-85 a base must be established for any experience G/L that has occurred. The 328,000 O/S 10-year base must equal the expected UAL at 12/31/85, so the experience gain during 1985 is $328,000 - 300,000$, or 28,000. To write down these bases from 01/01/86 to 01/01/87 does require some allocations:

Contribution toward all bases = $100,000(1.035) - 1.07(60,000) = 39,300$
Limit adjustment for IAL base = $350,000 \div \ddot{a}_{10|1.07} = 46,572$
Limit adjustment for Gain base = $-28,000 \div \ddot{a}_{10|1.07} = -3,726$

Contribution with respect to IAL base = $39,300 \times 46,572 \div (46,572 - 3,726)$
= 42,717
Unamortized amount of base = $1.07(328,000) - 42,717 = 308,243$

answer is D

There is a way to check your work in this problem. If you calculate the outstanding amount of the gain base, then the sum of the two bases should equal the expected UAL at 12/31/86.

Contribution with respect to Gain base = $39,300 \times -3,726 \div (46,572 - 3,726)$
= -3,417
Unamortized amount of base = $1.07(-28,000) + 3,417 = -26,543$
Total O/S 10-year bases = $308,243 - 26,543 = 281,700$

Expected UAL = $1.07(300,000 + 60,000) - 1.035(100,000) = 281,700$

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Problem 26

During 1987, the Section 415 dollar maximum was 90,000 at the Social Security Retirement Age. Even though this participant retires at 01/01/89, you must use the 90,000 limit in calculating the Section 415 limits. Note that the 200,000 compensation limit applies to all plans starting in 1989, but the benefit at 12-31-88 without the compensation limit is grandfathered. The 200,000 compensation limit will not change this participant's benefit calculation.

The benefit defined under the plan is 20% of FAE5. The FAE5 for this participant is $(200,000 + 250,000 + 250,000 + 300,000 + 300,000) \div 5$, which is 260,000. The final plan benefit is 260,000 times 20%, or 52,000. The 100% FAE3 limit is reduced based on years of service less than 10, and it equals $283,333(5 \div 10) = 141,667$. The floor below which benefits can not be reduced is similarly reduced, and it equals $10,000(5 \div 10) = 5,000$.

The participant's SSRA is 65 since date of birth is before 1938. The 90,000 limit must be reduced to allow for the retirement age of 60. The reductions specified in Section 415 are 6 2/3% per year for the first three years prior to SSRA, and 5% per year thereafter. Starting at age 62, an actuarial reduction must be used, based on the greater of the interest rate in the plan or 5%.

The resulting limitation at age 62 is $90,000(1 - 3(.06667)) = 72,000$. After the actuarial reduction down to age 60, the limit is 64,000, which equals $72,000(1,200 \div 1,350)$. This participant only has two years of participation at retirement, so the final dollar limit is 2/10ths of 64,000, which equals 12,800.

The final benefit is the lesser of 40,000 or 141,667, or 12,800, but not less than the lesser of 40,000 or 5,000. The final benefit is 12,800.

answer is A

If the plan had been in effect prior to 12/31/86, the participant's accrued benefit under the rules of Section 415 prior to 12/31/86 would be protected. See question 12 of IRS Notice 87-21 for more discussion on this.

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Problem 27 - Page 1

Since the problem states that the DB plan benefit will be reduced if the Section 415 limits are exceeded, you must calculate the DC fraction under Section 415(e)(3) first. The maximum DB plan fraction will then equal one minus the DC fraction. Then you can "back into" the projected benefit under the DB plan that will produce the DB fraction.

The DC fraction represents the ratio of the annual additions to a participant's account to the theoretical maximum annual additions. After the passage of TEFRA, the limit on the sum of the DB and DC fractions was changed from 1.40 to 1.00. This change required applying the 1.25 and 1.40 factors in the calculation of the denominator. If the participant had been hired prior to 1986, the computation of the DC fraction would take into account years of service prior to the effective date of the plan (see IRC Section 415(e)(3)(B)).

One item that was changed by the Tax Reform Act of 1986 is the definition of employee contributions that are included in the annual additions. Since the DC plan was effective at 01/01/86, the 1986 annual addition should be calculated under the old definition. Prior to 1987, the lesser of $\frac{1}{2}$ of EEC, or the excess over 6% of pay of EEC should be included in the annual addition. As a result, the 1986 annual addition does not include any employee contributions. After 1986, all employee contributions are included in the definition of the annual addition.

Plan Year Ending	Annual Comp	<u>Calculation of Theoretical Maximum Addition</u>						annual addition
		25% of Comp	1.40 x 25%	DC \$ limit	1.25 x \$	lesser 1.25, 1.40		
12/31/86	50,000	12,500	17,500	30,000	37,500	17,500		2,500

In general, there is no reason to calculate a projected DC fraction, because you can not project increases in the 415 limits. If you project current pay based on a salary scale, the projected DC fraction will be higher than today's DC fraction. The only exception to this is when the DC plan has been terminated, and you know that all future annual additions will be zero.

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Problem 27 - Page 2

The DC fraction for this participant is $2,500 \div 17,500 = .1429$. This seems to imply that the maximum allowable DB fraction is $1 - .1429$, which is $.8571$. This is not possible, since the largest possible DB fraction under Section 415(e)(2) is $1/1.25 = .8000$, which results from a projected benefit equal to the DB plan dollar maximum. If the 100% FAE3 limit applied, then the DB fraction is $1/1.40 = .7143$.

Now you must calculate the DB plan fraction in order to determine the maximum projected benefit for valuation purposes. Smith is age 60 at 01/01/88, and will attain normal retirement age of 62 at 01/01/89. With an effective date of 01/01/87, Smith's participation service under this plan will be two years. Based on the 01/01/86 date of hire, total service at retirement will be three years.

1986 pay corresponds to age 59 = 50,000
1987 pay corresponds to age 60 = 53,000 = $50,000(1.06)$
1988 pay corresponds to age 61 = 56,180 = $50,000(1.06)(1.06)$
3 year final average pay = 53,060

Projected plan benefit prior to limitations = 56,180

100% FAE3 Section 415 limit = 53,060
Reduce based on years of service less than 10 = $53,060(3 \div 10) = 15,918$

Social Security Retirement Age = 65 since born prior to 1938
Section 415 dollar limit during 1987 = 90,000 at age 65
Reduce $6 \frac{2}{3}\%$ per year for 1st 3 years $\Rightarrow 90,000(1 - 3(.06667))$
= 72,000 at age 62
Reduce based on years of participation less than 10 = $72,000(2 \div 10)$
= 14,400

PB = final projected benefit
DB fraction = 80% = $PB \div (\text{lesser of } 1.25(14,400) \text{ or } 1.40(15,918))$
PB = 80% (lesser of 17,800 or 22,285)
= 14,400

answer is A

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Problem 28

This problem requires knowledge of a very fine detail that was changed by the Tax Reform Act of 1986. Section 404(a)(7)(A) of the IRC states the deductible limitation for combinations of DB and DC plans. The limit is the greater of 25% of compensation, or the minimum contribution requirement of the DB plans required under Section 412. Section 4972 of the IRC imposes a 10% excise tax on contributions exceeding the deductible limitation.

For a plan funded under the Aggregate method with a zero credit balance, the normal cost calculated payable at the end of the year is the minimum required contribution at that date. The total contribution paid for the year is 100,000 + 300,000, or 400,000. The excise tax is 10% of the excess of 400,000 over the greater of 25%(1,000,000) or the 275,000 minimum. The excise tax equals $10\%(400,000 - 275,000) = 12,500$.

answer is D

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Revised
10/29/88

Problem 29

This problem tests your ability to memorize the procedure for calculating the average value of assets that is stated in the regulations at 1.412(c)(2)-1. The Pension Protection Act eliminates use of this method after 1987 for non-multiemployer plans. The market value of assets at 01-01-87 should be increased by the 20,000 outstanding contribution paid 03-15-87, giving 633,000 as the market value.

<u>1985 cash flows</u>		<u>1986 cash flows</u>	
Contributions	150,000	Contributions	195,000
Interest	9,000	Interest	0
Benefit payments	-10,000	Benefit payments	-150,000
Dividends	8,000	Dividends	12,000
	<hr/>		<hr/>
	157,000		57,000

	Asset values as of		
	1-1-85	1-1-86	1-1-87
Market value	564,000	660,000	633,000
1986 adjustments	57,000	57,000	
1985 adjustments	157,000		
	<hr/>	<hr/>	<hr/>
Adjusted value	778,000	717,000	633,000

The three year average value is $(778,000 + 717,000 + 633,000) \div 3 = 709,333$, which is the actuarial value of assets. The actuarial value of assets must fall within the corridor bounded by the lesser of 85% of the average value of assets or 80% of the market value of assets on the low end, and 115% of the average value of assets or 120% of the market value of assets on the high end. The corridor is 506,400 to 759,600, and the actuarial value of assets falls within that range.

answer is E

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11/02/95

Problem 30

There are only a few aspects of this problem that are difficult. The hardest thing to get straight is which valuation corresponds to which tax year. The deductible limit for the taxable year ending 09/30/87 is based on the valuation for the plan year beginning in that tax year. The 01/01/87 valuation should be used to determine the deductible limit needed for the answer to this problem.

The assets for section 412 are given at 01/01/87, and they would never include any 1987 plan year contributions. The reason is that those contributions have not been credited to the MFSA before 01/01/87.

When you calculate the section 404 PVNC and normal cost, the assets must be adjusted to include contributions which were deducted for prior taxable years. The assets for section 404 should include the 50,000 which was contributed after 01/01/87, but which was considered a 1986 tax year contribution.

Under the Aggregate method, there will be no limit adjustments. The deductible limit is based entirely on the normal cost calculation:

$$404 \text{ AAV} = 700,000 + 50,000 \text{ (deducted for 1986)} = 750,000$$

$$404 \text{ PVNC} = 3,000,000 - 750,000 = 2,250,000$$

$$\text{PV of earnings} \div \text{earnings} = 15,000,000 \div 1,500,000 = 10$$

$$\text{NC} = 2,250,000 \div 10 = 225,000$$

The deductible limit is adjusted with interest to the earlier of the end of the plan year, or the end of the tax year. In this problem, you adjust from 01/01/87 to 09/30/87:

$$\text{Deductible limit} = 225,000(1+.07(3+4)) = 236,812$$

answer is C

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Problem 31

Revenue Ruling 81-212 contains acceptable methods used to allocate Minimum Funding Standards Account items when a plan is spun off into two or more plans. Problem 24 tests the method used to allocate the outstanding amortization bases upon spinoff. This problem tests the method used to allocate the credit balance upon spinoff. Revenue Ruling 86-47 contains different rules which must be used when the market value of assets exceeds the present value of benefits on a termination basis (before the plan is spun off), and when one of the spun off plans has a zero UAL.

At the date of spinoff, the present value of benefits on a termination basis is used to allocate the market value of assets to the spun off plans. The method requires you to allocate the excess of the market value of assets over the credit balance on the same basis to the spun off plans. Then the difference between the two allocated values gives the credit balance.

The market value of 600,000 must be allocated first. The original plan has 510,000 of liabilities in priority categories one through five, and 165,000 of liabilities in priority category six. The market value can be allocated to the spun off plans based on 100% of the liability for vested benefits, and $(600,000 - 510,000) \div 165,000 = 54.55\%$ of the remaining liability:

	<u>Plan A</u>	<u>Plan B</u>	<u>Plan C</u>
100% of vested liability	510,000	165,000	345,000
54.55% of non-vested liability	90,000	32,727	57,273
Allocated market value	600,000	197,727	402,273

The market value less the credit balance must be allocated next. The market value less the credit balance of 80,000 is 520,000. This amount can be allocated to the spun off plans based on 100% of the liability for vested benefits, and $(520,000 - 510,000) \div 165,000 = 6.06\%$ of the remaining liability:

	<u>Plan A</u>	<u>Plan B</u>	<u>Plan C</u>
100% of vested liability	510,000	165,000	345,000
6.06% of non-vested liability	10,000	3,636	6,364
Allocated MVA - credit balance	520,000	168,636	351,364
Allocated market value	600,000	197,727	402,273
Credit balance	80,000	29,091	50,909

answer is E

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Problem 32

There are only a few aspects of this problem that are difficult. The hardest thing to get straight is which valuation corresponds to which tax year. The deductible limit for the taxable year ending 12/31/87 is based on the valuation for the plan year beginning in that tax year. The 07/01/87 valuation should be used to determine the deductible limit needed for the answer to this problem.

The only item missing for the calculation of the deductible limit is the limit adjustment for the Initial Accrued Liability. You can derive the amount of the IAL based on the MFSA items given. As usual, you must use the relationship between the UAL, O/S 412 bases and the credit balance:

$$UAL = O/S \text{ 412 bases} - CB$$

$$UAL = 450,000 = IAL \left(\frac{a_{\overline{22}|.07}}{a_{\overline{30}|.07}} \right) - 25,000$$

$$IAL = 475,000 \div (11.0612 \div 12.4090) \\ = 532,878$$

$$\text{Limit adjustment} = 532,878 \div \frac{a_{\overline{10}|.07}}{a_{\overline{10}|.07}} = 70,906$$

The deductible limit is the normal cost plus limit adjustments adjusted with interest to the earlier of the end of the plan year, or the end of the tax year. In this problem, you adjust from 07/01/87 to 12/31/87:

$$\text{Deductible limit} = (45,000 + 70,906)(1 + .07(6 \div 12)) = 119,963$$

answer is C