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FALL 1998 EA-2 EXAM SOLUTIONS (Course P-365U)

Solutions last revised June 20, 2006

See revision history on next page

These solutions use beginning of year amortization payments in setting up the Minimum Funding Standard Account. These solutions were prepared based on the law as in effect at June 30, 1998.

These solutions have been compared with those produced by other technical actuaries, and they represent my best understanding of the correct way to solve these problems. As usual, it seems easy to get an answer in the correct range as long as you are not actually taking the exam!

For problems involving the deductible limit you should use the following sequence of steps:

1. Calculate the normal cost plus limit adjustments with interest to the earlier of the end of the plan year or the end of the tax year.

2. Calculate the Full Funding Limitation under Section 404 with interest to the end of the plan year. If this is less than the result of step one, then you can skip to step four.

3. Calculate the absolute minimum amount necessary to produce a non-negative credit balance in the Minimum Funding Standard Account. This amount should never be based on the Alternative MFSA. This amount may be increased by the amount of any "includible employer contribution."

4. The maximum deductible limit is the greater of (1) and (3), but not greater than (2).

5. If the Unfunded Current Liability exceeds the final deductible limit and the plan has more than 100 participants, then the final deductible limit will be the UCL. This UCL limit is only available to non-multiemployer plans.

Revision History:

June 20, 2006	Clarified solutions for problems 21, 22 and 34
December 13, 2004	Clarified solution for problem 32
April 30, 2003	Corrected solution for problem 30
January 7, 2003	Clarified solution for problem 43
December 17, 2002	Corrected solutions for problems 22 (page 1), and 41 (page 2)
June 18, 2002	Corrected solutions for problems 21(page 2), 26(page 1), and 41(page 1)
May 6, 2002	Added note to problem 28
July 6, 2001	Corrected annuity symbol in problem 27
January 5, 2001	Corrected solutions for problems 6, 12, 19 (page 1), 20, 30 (page 2), 34, 46 (pages 1-2), and 47
July 11, 2000	Corrected solutions for problems 19 (page 1), 20, 21 (page 2), 23, 27, 31 (pages 1-2), 33 (page 1), 35 (page 2), 37 (page 2), 39 (page 1), 40, and 46 (pages 1-3)
September 18, 1999	Original solutions

Problem 1

TRUE

This question tests a small detail in ERISA. Section 204 deals with benefit accrual requirements. The question is virtually a direct quote from section 204(h)(1).

Answer is A

Problem 2

TRUE

The Transition Rule of IRC section 412(l)(11) can be elected in any year, independent of any prior year's election. This is in contrast to the Optional Rule, which was a one time election in 1995.

See IRC section 412(l)(11)(A).

Answer is A

Problem 3

FALSE

The key to this question is that no one covered under the DB plan is also covered under the DC plan, since each covers a different classification of employees. As a result, the combined limit of IRC section 404(a)(7) does not apply.

See IRC section 404(a)(7)(C).

Answer is B

Problem 4

TRUE

This question tests your general pension plan knowledge.

See ERISA sections 105(a) and 105(b).

Answer is A

Problem 5

TRUE

This question tests your knowledge of a tiny detail in the Top Heavy regulation.

See question T-5 of the 1.416-1 regulation.

Answer is A

Problem 6 **Revised 01/05/01**

TRUE

IRC section 412(n) imposes a lien (enforceable by the PBGC) upon failure to make required installments under 412(m) for plans with an unpaid balance of installments that exceeds 1,000,000. In addition, the plan must have a funded current liability percentage (as defined in 412(l)(8)(B)) less than 100%.

PBGC regulation 4043.81 specifies that notice is required for failure to pay the required installments. At 4043.4(d), it states that the PBGC may grant waivers or extensions to the notice requirement.

PBGC Technical Update 97-6 grants an exemption for employers with 100 or fewer participants in their defined benefit plans.

Answer is A

Problem 7

TRUE

This question tests your knowledge of the definition of a highly compensated employee. This is virtually a direct quote from IRC section 414(q)(1).

Answer is A

Problem 8

FALSE

This question tests your knowledge of Revenue Ruling 79-237. You are required to maintain the MFSA through the end of the year of plan termination. You are required to file a Form 5500 Schedule B for that year.

Answer is B

Problem 9

TRUE

This question tests your knowledge of the definition of normal retirement. This is virtually a direct quote from IRC section 411(a)(8).

Answer is A

Problem 10

FALSE

This question tests a tiny detail of the non-discrimination regulation. The only employees subject to this restriction are HCEs or former HCEs.

See IRS regulation 1.401(a)(4)-5(b)(3)

Answer is B

Problem 11

FALSE

In ERISA section 4213(a), it allows two choices for assumptions used in calculation of the UVB:

- Regulations prescribed by the PBGC (if any)
- Reasonable assumptions, the description of which sounds like the IRC section 412 "best estimate in the aggregate"

In ERISA section 4213(b), it states that the actuary may rely on the most recent valuation, and reasonable estimates for the interim years

Answer is B

Problem 12 **Revised 01/05/01**

FALSE

This is almost a direct quote from the regulation at 1.415-5(2), with one word changed:

"The adjusted dollar limitation … applies with respect to limitation years ending with or within that calendar year."

Answer is B

Problem 13

TRUE

This question tests your knowledge of the integration requirements in IRC section 401(l). As shown in the table in problem 43, the maximum permitted disparity at age 65 varies from .65% for SSRA of 67 to .75% for SSRA of 65. The maximum disparity in this plan is .65% for the first ten years, which is allowable. There is also a cumulative permitted disparity limit. Since the plan accrues benefits for only the first 35 years, it can not exceed that limit.

Answer is A

Problem 14

TRUE

This question tests your knowledge of the definition of protected benefits under IRC section 411(d)(6)(A). It is not allowable to decrease the accrued benefit of a participant. It is not allowable to eliminate or reduce early retirement benefits, retirement type subsidies, or optional forms of benefit with respect to service before the plan amendment.

Answer is A

Problem 15

TRUE

The Tax Reform Act of 1997 changed the amortization period for the OBRA Full Funding Credit base from 10 to 20 years. This change is effective starting in 1999.

See IRC section 412(b)(2)(E)

Answer is A

Problem 16

FALSE

This question tests your knowledge of Revenue Procedure 95-51. Section 3.13 grants automatic approval for a change in the valuation date to the first day of the plan year. There is no automatic approval for a change to the last day of the plan year.

Answer is B

Problem 17 - Page 1

Similar to 1996 #14

At 01/01/99

Age 49 Birth date 01/01/50

§411(c)(2) of the IRC defines the calculation of the employee provided accrued benefit. After the passage of OBRA '89, the §417(e) graded rates are used to accumulate the employee contributions plus interest (EECWI) from the determination date to normal retirement age. The resulting EECWI is converted to an annual annuity by dividing by an annuity at the immediate interest rate. For a normal form other than a life annuity, factors in Revenue Ruling 76-47 were used to adjust the resulting benefit.

You are given no information on the old PBGC graded interest rates under §417(e)(3). This plan apparently has been amended to reflect the new GATT rules for lump sum calculations under §417(e)(3). The §417(e) rate is used to accumulate the employee contributions plus interest (EECWI) from the determination date to normal retirement age. The resulting EECWI is converted to an annual annuity by dividing by an annuity at the §417(e) interest rate.

You are given the total accrued benefit at 01/01/99 as 1,100. The next step is to calculate each year's employee contributions with interest, and then the amount of the employee provided accrued benefit:

Year	01/01 EECWI	12/31 contribution	120% A.F.R.	12/31 EECWI calculation
1997	-0-	900	N/A	900
1998	900	900	7.13%	1,864 = 1.0713 * 900 + 900

Smith is age 49 at 01/01/99, and you have to convert the contribution balance to a benefit at normal retirement age, which is 16 years later. The EECWI is accumulated with interest at the §417(e) rate until normal retirement age 65:

EECWI at 65 = $1{,}864 * (1.0599)^{16}$
= 4,729

Problem 17 - Page 2

The employee provided annual accrued benefit at age 65 is calculated by dividing by the annuity value at the §417(e) interest rate of 5.99%:

4,729 ÷ 10.70 = 441.92

The question asks for the employer provided annual accrued benefit. This equals the total accrued benefit less the employee provided portion:

1,100 - 441.92 = 658.08

Answer is C

Problem 18 Similar to 1997 #23

With an aggregate type cost method, you need both the market value of assets and the Entry age normal valuation results to check the Full Funding Limitation. Since you have these values, you should calculate the FFL values.

The problem asks for the deductible limit for 1998, which you calculate as normal cost plus limit adjustments. Under the Aggregate method, there are no 404 bases. Since you have an end of year valuation, the deductible limit is equal to the normal cost.

Deductible limit = 74,000

The next step is to check the Full Funding Limitation under §404.

§404 "ERISA" FFL = (1+i)*(NC + AL - (lesser MVA,AAV))
= 635,000 - 590,000
= 45,000

§404 "OBRA" FFL = 1.50 (12/31 CL) - (1+i)*(lesser (MVA,AAV)) (if no benefit payments)
= 1.50*630,000 - 590,000
= 355,000

§404 "RPA 94" FFL = .90 (12/31 CL) - (1+i)*(AAV) (if no benefit payments)
= .90*735,000 - 610,000
= 51,500

Note that the end of year asset value (if any) should be used in calculating the OBRA and RPA ’94 FFL. The reason is that any benefit payments during the year should be reflected at the valuation rate in the assets, and presumably are included in the end of year value. They would be accumulated at the current liability interest rate in the end of year current liability value.

The final §404 FFL value is the greater of the RPA ’94 floor, and the lesser of the ERISA and OBRA FFL values, or 51,500. Since the §404 FFL applies, you don’t need to calculate the §412 minimum contribution.

You are given the participant count of “less than 100.” The plan sponsor is not eligible for the deductible limit based on the Unfunded Current Liability. The final deductible limit is the FFL of 51,500.

Answer is C

Problem 19 - Page 1 Similar to 1996 #34 **Revised 01/05/01**

Revenue Procedure 95-51 (modified by RP 98-10) contains the rules for setting up a new amortization base when there is a change in cost method. Section 5.01(1) of Revenue Procedure 95-51 specifies that certain bases must be maintained regardless of the funding method that is used. These bases include waivers, shortfall gains and losses, switchback from AMFSA, and the OBRA Full Funding credit base.

In general, the calculation of the normal cost must satisfy the formulas that are applicable to all reasonable funding methods (see the regulations at §1.412(c)(3)-1):

Except under the Aggregate method

PV Future Normal costs = PV Future Benefits - Actuarial Assets
- (O/S §412 amortization bases - credit balance - ARA)

Section 5.01(2) requires that you set up a new method change base such that the UAL = O/S 412 bases - credit balance - ARA. If you change to a method other than Aggregate, then you must determine the method change base so that the equation of balance is satisfied.

The main point of this problem is whether you know the amortization periods for multiemployer plans. These plans were not subject to the requirements of OBRA '87, so the amortization periods reflect the pre-OBRA '87 rules:

Amortization base	Amortization amount	Remaining years	Outstanding base
1-1-96 Initial AL	43,000	28 = 30-(98-96)	558,428 = 43,000 * $\ddot{a}_{\overline{28}\|.07}$
1-1-97 Loss base	3,500	14 = 15-(98-97)	32,752 = 3,500 * $\ddot{a}_{\overline{14}\|.07}$
1-1-97 Assump base	8,500	29 = 30-(98-97)	111,665 = 8,500 * $\ddot{a}_{\overline{29}\|.07}$
All Total			702,845

UC UAL = O/S bases + Method - CB
560,000 = 702,845 + Method - 2,500
Method = 560,000 - 702,845 + 2,500 = -140,345

The amortization period for all cost method change amortization bases specified in Revenue Procedure 95-51 is 10 years.
Method amortization = -140,345 / $\ddot{a}_{\overline{10}\|.07}$ = -18,675

Problem 19 - Page 2

1998 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	50,000	Credit Balance	2,500
IAL amortization	43,000	Method amortization	18,675
Loss amortization	3,500		
Assump amortization	8,500	12/31 contrib	x
7% interest	7,350	7% interest	1,482
Total charges	112,350	Total credits	x + 22,657

The minimum contribution payable 12/31/98 is 112,350 - 22,657 = 89,693.

Answer is B

Problem 20 **Revised 01/05/01**

This table summarizes the assumption basis for full funding limitations:

LAW definition	Interest rate	Mortality table
ERISA	Valuation	Valuation
OBRA 87 - 150% CL	90% - 110%	Valuation
RPA 94 - 90% CL	1998: 90% - 106%	GAM 1983

I. NOT TRUE

See §412(l)(9)
The 412(l) AFC gateway calculation is always made using the RPA '94 current liability, but with the highest interest rate in the applicable range. As shown in the table above, the RPA '94 current liability uses the mandated mortality assumptions.

II. NOT TRUE

See §412(l)(7)
The 404 unfunded current liability is always determined using the RPA '94 current liability. As shown in the table above, the RPA '94 current liability uses the mandated mortality assumptions.

III. TRUE

See §412(c)(7)
As shown above, the OBRA 87 full funding limitation is determined using the valuation mortality.

Only III is valid

Answer is D

Problem 21 - Page 1 Similar to 1997 #36 **Revised 06/20/06**

You are told there were no required quarterly contributions for 1997. To calculate the required quarterly contribution for 1998, you must first calculate the required annual payment (RAP). This is the lesser of last year's minimum required contribution or 90% of this year's. These numbers are both interest adjusted to the first day of this plan year, and they both would not reflect any credit balance.

You are given the components of the minimum contribution for both 1998 and 1997:

12/31/97 "MFSA excluding CB" = (50,000 NC + 70,000 amort) * 1.07 = 128,400
01/01/98 "MFSA excluding CB" = (66,000 NC + 70,000 amort) = 136,000

Lesser of 1997 or 90% of 1998 = Lesser of (128,400 or .90 * 136,000) = 122,400

The required quarterly installment is based on the applicable percentage multiplied by the RAP, which is 25%(122,400) = 30,600.

You may use the 01/01/98 credit balance like an employer contribution for a required quarterly installment, but only if the contribution that creates the credit balance is actually in the trust fund at the installment date. The problem states that the 1997 contribution was paid at 04/15/98, so you can apply the credit balance towards the 04/15/98 installment.

Date	Required	Amount Available	Overpayment (Underpayment)
01/01/98		60,000	60,000
04/15/98	30,600	60,000 * [1+ (.07)*(3.5/12)] = 61,225	61,225 - 30,600 = 30,625
07/15/98	30,600	30,625 * [1+ (.07)*(3/12)] = 31,161	31,161 - 30,600 = 561
10/15/98	30,600	561 * [1+ (.07)*(3/12)] = 571	571 - 30,600 = (30,029)
01/15/99	30,600	0	(30,600)

The interest penalty is calculated based on the period of the underpayment, and is applied to the amount of the underpayment. Using simple interest, the interest penalty is calculated as follows:

Pmt date	Period	Amount	Penalty interest	Valuation interest	Penalty
10/15/98	6 months	30,029 *	[(1+(.1048)(6/12))	- (1+(.07)(2.5/12))	] = 1,136
01/15/99	3 months	30,600 *	[(1+(.1048)(3/12))	- (1+(.07)(0/12))	] = 802
					1,938

Problem 21 - Page 2 **Revised 06/18/02**

When the underpayment period extends beyond the end of the plan year, interest at the valuation rate is only credited to the end of the plan year. The 175% of the F.M.R. continues to accrue to the date of payment.

Answer is B

Compound interest is "harder". Since the time period is less than one year, it produces a smaller payment, and a larger underpayment:

Date	Required	Amount Available	Overpayment (Underpayment)
01/01/98		60,000	60,000
04/15/98	30,600	60,000 * $(1.07)^{3.5/12}$ = 61,196	61,196 - 30,600 = 30,596
07/15/98	30,600	30,596 * $(1.07)^{3/12}$ = 31,118	31,118 - 30,600 = 518
10/15/98	30,600	518 * $(1.07)^{3/12}$ = 527	527 - 30,600 = (30,073)
01/15/99	30,600	0	(30,600)

The interest penalty is calculated based on the period of the underpayment, and is applied to the amount of the underpayment. Using compound interest, the interest penalty is calculated as follows:

Pmt date	Period	Amount	Penalty interest	Valuation interest	Penalty
10/15/98	6 months	30,073 *	[$(1.1048)^{6/12}$	- $(1.07)^{2.5/12}$	] = 1,110
01/15/99	3 months	30,600 *	[$(1.1048)^{3/12}$	- $(1.07)^{0/12}$	] = 772
					1,882

The resulting penalty is in the same range, as it must be!

Problem 22 - Page 1 Similar to 1997 #39 **Revised 06/20/06**

With an individual cost method, there are two things to be aware of. One is that you should check the Full Funding Limitation if you have the market value of assets. The other is that you should check for experience gains or losses each year.

Since this is a brand new plan, it should be clear that the FFL will not apply. You have to calculate the experience G/L during 1997. You must determine the expected UAL at 01/01/98, as well as the actual UAL at 01/01/98 before the plan amendment. The difference between those two values is the experience gain or loss base.

$$\begin{aligned} 01/98\ {}_eUAL &= (1+i)*(\ NC_0 + UAL_0\ ) - (\ contrib + i\ ) \\ &= 1.07 * (\ 75{,}000 + 600{,}000\ ) - [\ 1 + (9/12)*.07\ ] *(\ 160{,}000\ ) \\ &= 722{,}250 - 168{,}400 \\ &= 553{,}850 \end{aligned}$$

$$\begin{aligned} 01/01/98\ UAL &= 850{,}000 - 175{,}000 = 675{,}000 \\ Old\ plan\ \ AL &= 850{,}000 * (40/50) = 680{,}000 \\ Old\ plan\ \ UAL &= 680{,}000 - 175{,}000 = 505{,}000 \end{aligned}$$

$$\begin{aligned} Gain\ base &= 553{,}850 - 505{,}000 = 48{,}850 \\ Amortization &= 11{,}135 = 48{,}850 \div \ddot{a}_{\overline{5}|.07} \end{aligned}$$

$$\begin{aligned} Plan\ change &= 850{,}000 - 680{,}000 = 170{,}000 \\ Amortization &= 12{,}803 = 170{,}000 \div \ddot{a}_{\overline{30}|.07} \end{aligned}$$

To determine the credit balance at 01/01/98, you have to determine the outstanding amount of the IAL amortization base at 7%:

$$01/98\ {}_eUAL = O/S\ §412\ bases - CB - ARA$$

Amortization base	Original Base	Original years	Amortization	Remaining years	Outstanding base
01/97 IAL base	600,000	30	45,189	29 = 30 - (98-97)	593,648

$$\begin{aligned} 01/98\ {}_eUAL &= 553{,}850 = 593{,}648 - CB - 0 \\ 01/98\ CB &= 39{,}798 \end{aligned}$$

Problem 22 - Page 2

1998 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	100,000	Credit Balance	39,798
IAL Amort	45,189	1997 Gain	11,135
Plan change	12,803	04/01 contrib	x
7% interest	11,059	7% interest	3,565 + .0525x
Total charges	169,051	Total credits	54,498 + 1.0525x

The cheap trick to avoid in this problem is assumed payment of the minimum contribution at 04/01/98 (April Fool's!)

The minimum contribution is determined as follows:

$$\begin{aligned} 169{,}051 &= 54{,}498 + 1.0525x \\ x &= 114{,}553 / 1.0525 \\ &= 108{,}839 \end{aligned}$$

Answer is A

If you work the problem with compound interest, many items have different values. The minimum contribution is in the same range, as it must be!

Compound interest results	
Expected UAL	553,921
Gain base	48,921
Credit balance	39,727
Gain amortization	11,151
04/01/98 minimum	108,941

Problem 23 Similar to 1995 #22 **Revised 07/11/00**

With an aggregate type cost method, you would need both the market value of assets, and EAN valuation results to check the Full Funding Limitation. You do not have the EAN valuation results, so you can ignore it.

The deductible limit is the normal cost plus limit adjustments brought forward with interest to the earlier of the end of the plan year, or the end of the tax year. You are told to use the 07/01 valuation results to determine the deductible limit for the tax year ending 12/31. You should credit six months interest on the normal cost plus limit adjustments.

You must calculate the 07/01/98 UAL, which will allow you to calculate the Frozen Initial normal cost. Since the deductible limit has been paid at 12/31 each tax year, the UAL has decreased each year based on a ten year interest amortization. The reason is that, under aggregate type cost methods, the UAL is defined equal to the expected UAL. The deductible limit includes a six months interest adjustment. In the write down of the expected UAL, the contribution receives six months interest to the next valuation date:

$$\begin{aligned}
07/01/95\ eUAL &= (1+i)*(NC_0 + UAL_0) - (C+I) \\
&= (1+i)*(NC_0 + UAL_0) - [\ (1+i)^{.5} * (NC_0 + LA)] * (1+i)^{.5} \\
&= (1+i)*(NC_0 + UAL_0) - (1+i) * (NC_0 + LA) \\
&= (1+i)*\ (UAL_0 - LA) \quad = IAL * (\ \ddot{a}_{\overline{9}|.07}\ /\ \ddot{a}_{\overline{10}|.07}\ )
\end{aligned}$$

$$\begin{aligned}
07/01/98\ UAL &= {}_eUAL = O/S\ §404\ Ten\ year\ amortization\ bases \\
&= IAL * (\ \ddot{a}_{\overline{6}|.07}\ /\ \ddot{a}_{\overline{10}|.07}\ ) \\
&= 678{,}648 \quad = \quad 1{,}000{,}000 * (\ 5.1002 / 7.5152\ )
\end{aligned}$$

Now you can set up the §404 PVNC, and calculate the §404 normal cost:

$$\begin{aligned}
§404\ PVNC &= PVB - UAL - AAV \\
&= 546{,}352 \quad = \quad 2{,}200{,}000 - 678{,}648 - 975{,}000 \\
PVE / E &= 12{,}500 / 1{,}500 \ = \ 8.3333 \\
§404\ NC &= 65{,}562
\end{aligned}$$

$$\begin{aligned}
Limit\ adjustment &= IAL\ /\ \ddot{a}_{\overline{10}|.07} \\
&= 133{,}063 \ = \ 1{,}000{,}000 / 7.5152
\end{aligned}$$

$$\begin{aligned}
Deductible\ limit &= (\ 65{,}562 + 133{,}063\ ) * [\ 1 + (6/12)*(.07\ )\ ] \\
&= 205{,}577
\end{aligned}$$

Answer is C

On a compound interest basis, the answer is $205{,}459 = (65{,}562 + 133{,}063\ ) * (1.07\ )^{6/12}$.

Problem 24 - Page 1 Similar to 1994 #4

I found this to be a confusing problem. There are numerous items vying for your attention:

1. End of year valuation date
2. Plan termination at the valuation date
3. Less than 100 participants, can't use Unfunded Current Liability as alternate deductible limit
4. Entry Age Normal results can be used for Full Funding Limitation calculation under Individual Aggregate method

The "preliminary" minimum and maximum contributions are both equal to the 120,000 normal cost at 12/31/98.

The next step is to check the Full Funding Limitation under §404:

§404 "ERISA" FFL = (1+i)*(NC + AL - (lesser MVA,AAV))
= 100,000 + 650,000 - 600,000
= 150,000

§404 "OBRA" FFL = 1.50 (12/31 CL) - (1+i)*(lesser MVA,AAV)) (if no benefit payments)
= 1.50*850,000 - 600,000
= 675,000

§404 "RPA 94" FFL = .90 (12/31 CL) - (1+i)*(AAV) (if no benefit payments)
= .90*850,000 - 600,000
= 165,000

Note that the end of year asset value (if any) should be used in calculating the OBRA and RPA '94 FFL. The reason is that any benefit payments during the year should be reflected at the valuation rate in the assets, and presumably are included in the end of year value. They would be accumulated at the current liability interest rate in the end of year current liability value.

The final §404 FFL value is the greater of the RPA '94 floor, and the lesser of the ERISA and OBRA FFL values, or 165,000. The §404 FFL does not apply.

You are given the participant count of 65 employees during 1998. The plan sponsor is not eligible for the deductible limit based on the Unfunded Current Liability. So far, the deductible limit is the normal cost of 120,000.

Problem 24 - Page 2

The point of this question is that an employer may deduct payments made in the year of termination that are used to increase the assets up to the amount of the present value of guaranteed benefits, calculated on a PBGC basis:

Unfunded guaranteed benefits = 450,000 + 350,000 - 600,000
= 200,000

Answer is C

This situation is covered in IRC §404(g):

§404(g)(3)(A) In general, contributions under this section are deductible when paid
§404(g)(3)(B) Contributions under §404(g)(1) for a standard termination which cause the assets to exceed the present value of guaranteed benefits will not be deductible
§404(g)(1) Provides that any of the following payments are covered in this section:

1. §4041(b) Standard termination
2. §4062 Distress termination
3. §4063 Withdrawal liability for multiple employers in a controlled group
4. §4064 Termination liability for multiple employers in a controlled group
5. Part I of Subtitle E of Title IV of ERISA - Multiemployer withdrawal liability

And now, for the rest of the story …

The plan was terminated at 12/31/98 under a Standard Termination. This implies the employer contribution for the year was 300,000, calculated as follows:
(450,000 + 350,000 + 50,000 + 50,000) - 600,000.

If they had asked what the excise tax for the year was, I think the answer is 5,000. Here is the twisty trail to that result:

- The deductible limit is 200,000 under 404(g).
- Under 4972(c), there is an exemption for the excise tax when the employer can't deduct contributions to fully fund a terminating plan due to the minimum 100 participant rule in §404(a)(1)(D).
- If the plan had more than 100 participants, they could contribute and deduct the Unfunded Current Liability of 250,000, which would have been the deductible limit.
- Based on the actual contribution of 300,000, and the excise tax exemption under 4972(c), they only have to pay excise tax on the difference: 300,000 - 250,000.
- The excise tax would be 10% of 50,000, or 5,000.

Problem 25 - Page 1 Similar to 1996 #27

For plans which elect the Optional Rule, the amount of the 412(l) additional funding charge should be the greater of the values calculated under the post-GATT and pre-GATT rules. This problem gives you the values of the Deficit Reduction Contribution defined under both sets of rules.

This problem is one of the first on the Transition Rule. For plans which elect the Transition Rule, the amount of the 412(l) additional funding charge is limited by a ceiling. The ceiling is the greater of the "target amount" and the value of the §412(l) additional funding charge calculated under the OBRA 87 rules.

§412(l) AFC - OBRA 87 rules

The MFSA charges should be increased by the Unpredictable Contingent Event amount plus the excess, if any, of the DRC over the §412(b) amortization charges and credits, excluding the normal cost, and excluding amortization of G/L, assumption changes, and cost method changes. The DRC is defined as the sum of the unfunded old liability amount (UOLA) and the unfunded new liability amount (UNLA), without adding the current liability normal cost.

You must subtract the §412 amortization charge for the IAL and plan amendments from the DRC to calculate the §412(l) AFC. This §412(l) charge should be limited to the UCL, which you do not have. Then you must bring the §412(l) charge forward to the end of the year with interest at the current liability rate:

01/01/98 220,000 = 275,000 - (35,000 + 20,000)
12/31/98 235,400 = 1.07 * 220,000

§412(l) AFC - Post-GATT rules

The MFSA charges should be increased by the Unpredictable Contingent Event amount plus the excess, if any, of the DRC over the §412(b) normal cost plus all amortization charges and credits. The DRC is defined as the sum of the unfunded old liability amount (UOLA), the unfunded new liability amount (UNLA), and current liability normal cost.

You must subtract the §412 normal cost plus all amortization charges from the DRC to calculate the §412(l) AFC. Then you must bring the §412(l) charge forward to the end of the year with interest at the current liability rate.

01/01/98 147,000 = 255,000 - (45,000 + 35,000 - 2,000 + 20,000 - 5,000 + 15,000)
12/31/98 157,290 = 1.07 * 147,000

Problem 25 - Page 2

Based on Revenue Ruling 96-21, this end of year §412(l) charge should be limited to the end of year UCL, which you do not have.

Optional rule and Transition rule

Under the Optional Rule, the §412(l) AFC is the greater of the two values on the OBRA 87 and the Post GATT rules, which is 235,400.

The Transition Rule value is the greater of the target amount of 300,000, and the pre-GATT value of the §412(l) AFC of 235,400. The Transition Rule amount is 300,000.

The final §412(l) AFC value is the lesser of the Transition Rule value of 300,000, and the Optional Rule §412(l) AFC value of 235,400, or 235,400.

With less than 150 plan participants, you must pro-rate the §412(l) AFC. The pro-rata is based on the highest number of plan participants on any day in the prior plan year. Since the plan has two entry dates, use the highest number on 01/01/97 or 07/01/97, which is 136.

12/31/98 §412(l) AFC= 235,400*[1-2% * (150-136)]
= 235,400 * .72 = 169,488

Answer is D

One item that you might have missed is that any cost method amortization should be excluded in the definition of the OBRA 87 §412(l) AFC. This is not clear in the Internal Revenue Code, but the Schedule B instructions are clear on this point.

If you worked this problem incorrectly this way, you would end up with 173,340, which is in the correct answer range.

Problem 26 - Page 1 Similar to 1996 #41 **Revised 06/18/02**

With the Aggregate cost method, market value of assets, and EAN valuation results, you should check that the Full Funding Limitation (FFL) may apply. The deductible limit is the normal cost plus limit adjustments brought forward with interest to the earlier of the end of the plan year, or the end of the tax year. With a 12/31 valuation date, there is no interest applied. Under the Aggregate method, the limit adjustments equal zero.

The first step is to set up the §404 PVNC, and calculate the §404 normal cost:

§404 PVNC = PVB - AAV
= 3,875,000 - 1,140,000 = 2,735,000
PVE / E = 32,750,000 / 1,700,000 = 19.2647
§404 NC = 141,969

Deductible limit = 141,969

The second step is to check the Full Funding Limitation under 404:

§404 "ERISA" FFL = EAN AL + NC - (lesser MVA,AAV)
= 114,000 + 1,190,000 - 1,130,000
= 174,000

§404 "OBRA" FFL = 1.50 (12/31 CL) - (1+i)*(lesser MVA,AAV)) (if no benefit payments)
= 1.50 * 875,000 - 1,130,000
= 182,500

§404 "RPA 94" FFL = .90 (12/31 CL) - (1+i)*(AAV) (if no benefit payments)
= 0.90 * 875,000 - 1,140,000
= -0-

The §404 FFL of 174,000 does not apply. Now you must check the §412 minimum contribution to see if it is greater. One reason this may happen is the funding deficiency at 12/31/97. At the 12/31/98 valuation date, the funding deficiency is 1.07(30,000) = 32,100.

§412 PVNC = PVB - AAV - (O/S §412 bases - CB)
= 3,875,000 - 1,140,000 - (0 + 32,100)
= 2,702,900
PVE / E = 32,750,000 / 1,700,000 = 19.2647
§412 NC = 140,303

Problem 26 - Page 2

1998 Minimum Funding Standard Account

Charges		Credits	
12/31 Debit balance	32,100	Credit Balance	0
12/31 Normal Cost	140,303	12/31 contrib	x
7% interest	0	7% interest	0
Total charges	172,403	Total credits	x

At this point, the minimum contribution appears to be 172,403. You must still check to see if the §412 FFL applies. With a zero credit balance, the §412 FFL is the same as the §404 FFL of 174,000, so it has no effect on the minimum contribution.

The minimum contribution at 12/31/98 is 172,403. The deductible limit is the lesser of the 404 FFL of 174,000, or the greater of the normal cost plus limit adjustments of 141,969 and the minimum contribution of 172,403. The final result is 172,403.

If you had more than 100 participants, then the final test for the deductible limit would be the Unfunded Current Liability. In this problem you have no information on the participant count. The UCL is zero, so it would not have any effect.

Answer is B

Problem 27 Similar to 1995 #23 **Revised 07/06/01**

In question 5 on this exam, they previously asked how Top Heavy minimum benefits are treated when the plan's benefit accruals have been frozen. The answer is that they continue to accrue for each additional year the plan is Top Heavy.

At 01/01/98

Age	53	Birth date	01/01/45
		Freeze date	01/01/90
Service	6 years	Hire date	01/01/84
Participation	6 years	Participation date	01/01/84

The plan's accrued benefit at 01/01/98 is equal to 6 years of service times 12 times $120 per month:

Plan AB = 6(12)(120)
= 8,640

In IRC §416, the Top Heavy (T-H) minimum benefit accrual rate is 2%. This is multiplied by T-H earnings averaged over five years times T-H service (up to a maximum of ten years). The plan has been T-H since 01/01/84, so the T-H minimum will be based on 10 years of T-H service at 01/01/98:

FAE5 = 45,000
T-H AB = 45,000(.02)(10)
= 9,000

The final accrued benefit at 01/01/98 is the greater of the plan AB or the T-H AB. The key point of this problem is that the T-H benefit is defined based on payment on a life annuity basis (see IRC §416(c)(1)(E)). You need to adjust the T-H minimum to reflect payment on the 10 year certain and life normal form:

T-H minimum on life annuity	9,000
T-H minimum on 10 C&L	8,481 = 9,000 * (9.8 / 10.4)

Final accrued benefit = greater of 8,640 and 8,481, which is 8,640. The T-H minimum benefit does not apply in this problem.

$$\text{Accrued Liability} = 8{,}640 * \ddot{a}_{\overline{65:10}|}^{(12)} * \frac{D_{65}}{D_{53}}$$

$$= 8{,}640 * 10.4 * (1.07)^{-12}$$

$$= 39{,}897$$

Answer is D

Problem 28 **Revised 05/06/02**

I. TRUE

See §416(g)(2)(A)(i) and 1.416-1 question T-6
The code states that a required aggregation group consists of each plan in which a key employee is a participant. In addition, it includes each other plan which enables a plan (with a key employee participant) to satisfy the requirements of 401(a)(4) or 410. This is further clarified in question T-6 under the 1.416-1 regulation.

NOTE: The information given in this problem does not make sense based on current law. Plans A and B can not be aggregated for non-discrimination testing under the regulations at 1.410(b)-7(d)(5). The reason is that they do not have the same plan year. The 1.416-1 regulation was written in 1984, and has not been updated for subsequent law changes.

II. NOT TRUE

See 1.416-1 question T-23
The top heavy determination is made using data as of each plan's top heavy determination date. The data as of all determination dates within the same calendar year is used. The T-H ratio for the required aggregation group is based on 06/30/98 for Plan B, and 12/31/98 for Plan A.

The ratio is 400 / (300+400) = 57.1%, and the group is not top heavy. As a result, neither Plan A nor Plan B is top heavy.

III. NOT TRUE

See answer for Part II of this question.

Only I is valid

Answer is E

Problem 29

I. NOT TRUE

See §412(c)(7)(B)
§412(l)(7)(D) allows you to ignore pre-participation service when calculating the current liability for the §412(l) additional funding charge. But the definition of the current liability for the OBRA 87 Full Funding Limitation specifically disregards §412(l)(7)(D).

II. NOT TRUE

See §412(l)(7)(D)(ii)
These participants have three years of participation at 1/1/98. The percentage of current liability that should be excluded is 40%, but the percentage that should be included is 60%.

III. TRUE

See §412(l)(7)(D)(iv)

Only III is valid

Answer is C

Problem 30 - Page 1 Similar to 1997 #44 **Revised 04/30/03**

Starting in 1998, earnings under §415 are defined as total compensation. Earnings under §415 is not subject to the §401(a)(17) limit of 150,000.

At 01/01/98

Age	58	Birth date	1/1/40
Service	8 years	Hire date	1/1/90
Participation	8 years	Effective date	1/1/90
		Normal retirement age	58
		Social Security Retirement age	66

Accrued benefit at age 58 = 80,000 * .125 * 8
= 80,000

Normal retirement benefit at age 58 = 80,000

The §415(b)(1)(B) compensation limit is reduced when service is less than ten years.

Age 58 100% 3 year comp. §415 limit = 68,000 = 85,000 * (8/10)

Under §415(b)(1)(A), the dollar limit is reduced when participation is less than ten years.

Social Security Retirement Age	=	66 since born in 1940
§415 dollar limit during 1997	=	130,000 at age 66 * (8/10)
§415 dollar limit at age 65	=	130,000 * .8 * .9333
§415 dollar limit at age 64	=	130,000 * .8 * .8667
§415 dollar limit at age 63	=	130,000 * .8 * .8000
§415 dollar limit at age 62	=	130,000 * .8 * .7500 = 78,000

§415(b)(2)(E)(i) says to use the greater of 5% and the interest rate specified in the plan to reduce the §415 dollar limit prior to age 62. The examples in Revenue Ruling 95-29 clarify that the §415 dollar limit is reduced using the lower of the factors calculated based on the mandated mortality and interest rate, and plan basis for optional forms. Based on the general conditions for this exam, in the absence of other information, you should assume that the basis for optional form conversions is the same as the funding assumptions.

Problem 30 - Page 2 **Revised 01/05/01**

In this problem, you are not given the "N/N" factors. Instead, you should use the (1+i)*(ä/ ä) factors both on the plan basis and on the mandated basis.

Actuarial reduction from 62 to 58 = $(1.05)^{-4} * (\ddot{a}^{(12)}_{62} / \ddot{a}^{(12)}_{58})$

(mandated 5% GAM83 basis) = $(1.05)^{-4} * (12.456 / 13.587)$ = .754220

Actuarial reduction from 62 to 58 = $(1.065)^{-4} * (\ddot{a}^{(12)}_{62} / \ddot{a}^{(12)}_{58})$

(plan 6.5% GAM83 basis) = $(1.065)^{-4} * (10.961 / 11.810)$ = .721443

§415 dollar limit at age 58 = 78,000 * lesser of [.754220 or . 721443]

= 56,273

Smith's benefit of 80,000 is limited to the lesser of 68,000 and 56,273, which equals 56,273 or 4,689 per month.

Answer is B

Problem 31 - Page 1 **Revised 07/11/00**

The problem asks for the deductible limit for 1998, which you calculate as normal cost plus limit adjustments. You need to use the equation of balance under 412 to determine the Initial Accrued Liability:

Unfunded Actuarial Liability = O/S §412 amortization bases - credit balance - ARA

O/S Bases = UAL + CB = 75,000 + 20,000
O/S Bases = IAL * ($\ddot{a}_{\overline{23}|.07}$ / $\ddot{a}_{\overline{30}|.07}$)
95,000 = IAL * (12.0612 / 13.2777)
IAL = 104,581 = 95,000 / .9084

§404 PVNC = PVB - AAV - UAL
= 565,000 - 400,000 - 75,000 = 90,000
PVE / E = 1,700,000 / 165,000 = 10.3030
§404 NC = 8,735

Limit adjustment = 104,581 / $\ddot{a}_{\overline{10}|.07}$ = 13,916

Deductible limit = (8,735 + 13,916) * (1.07) = 24,237

The next step is to check the Full Funding Limitation under §404.

§404 "ERISA" FFL = (1+i)*(NC + AL - (lesser MVA,AAV))
= 1.07 * (18,000 + 400,000 - 396,000)
= 23,540

§404 "OBRA" FFL = 1.50 (12/31 CL) - (1+i)*(lesser MVA,AAV)) (if no benefit payments)
= 1.50 * 350,000 - 1.07 * 396,000
= 101,280

§404 "RPA 94" FFL = .90 (12/31 CL) - (1+i)*(AAV) (if no benefit payments)
= .90 * 350,000 - 1.07 * 400,000
= -0-

Note that the end of year asset value (if any) should be used in calculating the OBRA and RPA '94 FFL. The reason is that any benefit payments during the year should be reflected at the valuation rate in the assets, and presumably are included in the end of year value. They would be accumulated at the current liability interest rate in the end of year current liability value.

Problem 31 - Page 2 **Revised 07/11/00**

The final §404 FFL value is the greater of the RPA '94 floor, and the lesser of the ERISA and OBRA FFL values, or 23,540. Since the §404 FFL does apply, you do not need to calculate the §412 minimum contribution. The deductible limit is the lesser of the §404 FFL of 23,540, or the greater of the normal cost plus limit adjustments of 24,237 and the minimum contribution. The final result is 23,540, regardless of the magnitude of the minimum contribution.

If you had a plan covered by §412(l), then the final test for the deductible limit would be the Unfunded Current Liability. In this problem you have no information on the participant count. The UCL is zero, so it would not have any effect.

Answer is D

Problem 32 Similar to 1996 #39 **Revised 12/13/04**

Under the Rolling Five Method, the calculation of withdrawal liability is relatively simple. Employer B's share of the 12/31/96 UVB is based on the ratio of employer B's contributions in the prior five years to the total contributions in the prior five years.

The complicating factor in this problem is that Employer A withdrew in 1994. As a result, the total contributions in the denominator must be reduced by the amount of contributions for Employer A.

This problem also gives you the amount of the collectible (not uncollectible!) withdrawal liability for withdrawals in prior years (presumably for Employer A). Logically, this amount should be deducted from the unfunded vested benefit liabilities. The adjusted 12/31/96 value is 1,500,000 - 70,000 = 1,430,000.

YEAR:	1996	1995	1994	1993	1992
ER share = 1,430,000 * (	87,000 +	75,000 +	72,000 +	75,000 +	68,000)
(	1,111,000 +	1,103,000 +	1,073,000 +	1,023,000 +	927,000
	- 0 -	0 -	42,000 -	83,000 -	82,000)

$$= 107{,}179 = 1{,}430{,}000 * \frac{377{,}000}{(5{,}237{,}000 - 207{,}000)}$$

After determining Employer B's share of the UVB, the de minimis amount must be calculated. Then a deductible is calculated based on the amount of the de minimis and the employer's share of the UVB. The final withdrawal liability is calculated as the employer's share less the deductible.

The mandatory de minimis is the lesser of 50,000 or 3/4% of the plan's total UVB (.0075 * 1,500,000), which is 11,250. The deductible is the de minimis amount reduced by the excess of the allocated UVB over 100,000. Since the employer's share exceeds 100,000, the deductible equals the de minimis amount of 11,250 - 7,179 = 4,071. The final employer withdrawal liability is 107,179 - 4,071 = 103,108.

Answer is C

NOTES:

1. ERISA 4211(c)(3)(A) describes the Rolling Five method, and it states that you subtract the UVB for employers whose liabilities are collectible. There is no specific adjustment to the UVB for employers whose liabilities are not collectible. In ERISA 4209, there is NO similar adjustment to the UVB for calculating the de minimis amount.

2. ERISA 4211(c)(3)(B) implies that you subtract the contributions from the denominator of the fraction for any employers who had previously withdrawn. That includes both employers whose liabilities are collectible, and those whose liabilities are not collectible.

Problem 33 - Page 1 Similar to 1996 #19 **Revised 07/11/00**

The first step should be to calculate the normal cost plus limit adjustments. The only potential trick to the problem is that you should not amortize the OBRA Full Funding credit base when calculating the deductible limit. This base was set up to restore the equation of balance under §412, and has no meaning under §404.

The deductible limit is the normal cost plus limit adjustments brought forward with interest to the earlier of the end of the plan year, or the end of the tax year:

Limit adjustment = (775,000 + 40,000 - 96,000 + 95,000 + 230,000) / $\ddot{a}_{\overline{10}|.07}$

= 138,918

Deductible limit = 277,042 = (120,000 + 138,918) * (1.07)

The second step is usually to check the Full Funding Limitation under §404. In this problem, you are told that the Full Funding Limitation does not apply.

The last step is to complete the 1998 Minimum Funding Standard Account, assuming payment at 01/01/98 of the deductible limit:

IAL amortization = 775,000 / $\ddot{a}_{\overline{30}|.07}$ = 58,369

Assumption amortization = 40,000 / $\ddot{a}_{\overline{10}|.07}$ = 5,323

Gain amortization = -96,000 / $\ddot{a}_{\overline{5}|.07}$ = -21,882

OBRA FFC amortization = 49,000 / $\ddot{a}_{\overline{10}|.07}$ = 6,520

Loss amortization = 95,000 / $\ddot{a}_{\overline{5}|.07}$ = 21,654

Plan change amortization = 230,000 / $\ddot{a}_{\overline{30}|.07}$ = 17,322

Problem 33 - Page 2

1998 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	120,000	Credit Balance	55,000
IAL amortization	58,369		
Assump amortization	5,323	Gain amortization	21,882
FFC amortization	6,520		
Loss amortization	21,654	01/01 contrib	277,042
Plan chg amortization	17,322		
7% interest	16,043	7% interest	24,775
Total charges	245,231	Total credits	378,699

The credit balance is 378,699 - 245,231 = 133,468.

Answer is D

Problem 34 - Page 1 | Similar to 1996 #40 | **Revised 01/05/01**

With an individual cost method, you normally need to check for experience gains and losses each year. In this problem, you are told that there have been NO gains and losses. You need to determine the Limit Adjustments for the maximum deductible limit. You have to determine the remaining amortization period for the IAL base, and set up a new amortization base for the change in interest rate.

The regulation at §1.404(a)-14(h) contains rules for maintenance of 10-year amortization bases used to calculate the deductible limit. The limit adjustment on any "old" bases must be recalculated on the new 7% interest rate. The regulation specifies these steps:

1. Calculate the outstanding amount of each §404 base
2. Calculate the limit adjustment on the old interest rate for each base
3. Divide (2) into (1), which produces $\ddot{a}_{\overline{n}|.08}$
4. Solve for "n", which can be left exact, or rounded to integer value
5. Calculate $\ddot{a}_{\overline{n}|.07}$
6. Divide (5) into (1), giving the limit adjustment on the new interest rate for each base

You could follow steps 1-4 above, but it is not necessary. Since the deductible limit has been paid at the end of each prior plan year, the UAL represents 8 remaining years for amortization of the §404 IAL base.

Step #5 is calculation of $\ddot{a}_{\overline{8}|.07}$, which is 6.3893.

The change in interest rate produces a new §404 base at 01/01/98. You can calculate the UAL at 8% by using the equation of balance under §412:

8% UAL = O/S §404 bases
= IAL * ($\ddot{a}_{\overline{8}|.08}$ / $\ddot{a}_{\overline{10}|.08}$)

8% UAL = O/S §412 bases - credit balance - ARA
= 120,000 - CB - 0
120,000 = IAL * ($\ddot{a}_{\overline{28}|.08}$ / $\ddot{a}_{\overline{30}|.08}$)

IAL = 122,245

8% UAL = 104,693 = 122,245 * ($\ddot{a}_{\overline{8}|.08}$ / $\ddot{a}_{\overline{10}|.08}$)

CB = 120,000 – 8% UAL
= 15,307

Problem 34 - Page 2 **Revised 01/05/01**

7% UAL = 160,000 = 260,000 - 100,000
Assm base = 55,307 = 160,000 - 104,693

The following table summarizes the calculation of the new 7% limit adjustments for the outstanding 404 bases:

	IAL Base	Assumption Change base	Total
01/01/98 O/S §404 base	104,693	55,307	160,000
Years for annuity	8	10	
7% annuity value	6.3893	7.5152	
7% limit adjustment	16,386	7,359	23,745

Normal cost plus Limit adjustments at 7% interest:
1.07 (50,000 + 23,745) = 78,907

Since there are no loss bases, funding deficiencies, waivers, or OBRA FFC bases, the minimum funding requirement would not produce a greater deductible limit. The final steps are calculation of the §412 amortizations, and the MFSA for 1998.

	IAL Base	Assumption Change base
01/01/98 O/S §412 base	120,000	55,307
Years for annuity	28	10
7% annuity value	12.9867	7.5152
Amortization charge	9,240	7,359

1998 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	50,000	Credit Balance	15,307
IAL amortization	9,240	12/31 contrib	78,907
Assump. amortization	7,359		
7% interest	4,662	7% interest	1,071
Total charges	71,261	Total credits	95,286

The credit balance equals 95,286 - 71,261 = 24,025.

Answer is D

NOTE:
Due to the size of the normal cost and accrued liability, it should be clear that the neither the 404 Full Funding Limitation, nor the 412 Full Funding Limitation will apply.

Problem 34 - Page 3 **Added 01/05/01**

There is an alternative method of solution, as suggested by several students. This uses the difference in the amortization periods of the IAL, and it is probably as tricky as the somewhat longer solution I used:

8% UAL = O/S §412 bases - credit balance - ARA
= 120,000 - CB - 0
120,000 = IAL * ($\ddot{a}_{\overline{28}|.08}$ / $\ddot{a}_{\overline{30}|.08}$)
IAL = 122,245

Determine the 01/01/98 credit balance by accumulating the difference between the maximum and minimum contributions at 8% up to 01/01/98. The credit balance grows each year based on the difference between the ten year amortization for the maximum, and the thirty year amortization for the minimum:

01-98 CB = [122,245 / $\ddot{a}_{\overline{10}|.08}$ - 122,245 / $\ddot{a}_{\overline{30}|.08}$] $\ddot{s}_{\overline{2}|.08}$
= [16,869 – 10,054] * 2.25
= 15,307

8% UAL = O/S §412 bases – credit balance - ARA
= 120,000 – 15,307
= 104,693

Determine the 01/01/99 credit balance by accumulating the 01/01/98 credit balance, plus the difference between the maximum and minimum contributions at 7% up to 01/01/99. The O/S base under 404 will be amortized over the remaining 8 years, and the O/S base under 412 will be amortized over the remaining 28 years.

One neat trick is that you don't need to determine the new base due to the assumption change, since it has a ten year amortization under both the minimum and maximum contribution:

01-99 CB = [104,693 / $\ddot{a}_{\overline{8}|.07}$ - 120,000 / $\ddot{a}_{\overline{28}|.07}$ + 15,307] * 1.07
= [16,386 – 9,240 + 15,307] * 1.07
= 24,025

Answer is D

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Problem 35 - Page 1

Similar to 1996 #29

Revenue Procedure 95-51 (as modified by RP 98-10) contains the rules for setting up a new amortization base when there is a change in cost method. Section 5.01 of Revenue Procedure 95-51 specifies that certain bases must be maintained regardless of the funding method that is used. These bases include waivers, shortfall gains and losses, switchback from AMFSA, and the OBRA Full Funding credit base.

With an aggregate type cost method, you would need both the market value of assets, and EAN valuation results to check the Full Funding Limitation. Since you have no EAN valuation results, you can't calculate the Full Funding Limitation.

You need to set up the 1997 MFSA to derive the credit balance for the 1998 MFSA:

Amortization base	Original Base	Amortization
1-1-90 IAL base	1,000,000	75,314 = 1,000,000 / $\ddot{a}_{\overline{30}\vert .07}$
1-1-97 Assump base	100,000	13,306 = 100,000 / $\ddot{a}_{\overline{10}\vert .07}$

1997 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	300,000	Credit Balance	-0-
IAL amortization	75,314	Assump amortization	13,306
		12/31 contribution	85,000
7% interest	26,272	7% interest	931
Total charges	401,586	Total credits	99,237

At 12/31/97, the deficiency is 401,586 - 99,237 = 302,348. After the waiver of 245,000, the plan still has a debit balance of 57,348 at 01/01/98. This is typical for waiver problems on the exam.

The calculation of the normal cost under the FIL method must satisfy the formulas that are applicable to all reasonable funding methods (see the regulations at §1.412(c)(3)-1):

Except under the Aggregate method

PV Future Normal costs = PV Future Benefits - Actuarial Assets
- (O/S §412 amortization bases - credit balance - ARA)

Problem 35 - Page 2 **Revised 07/11/00**

The effect of the change in the asset valuation method creates a new amortization base at 01/01/98. The actuarial value of assets increased from the AMV of 970,000 to the MVA of 1,200,000. This increase of 230,000 in the AAV means that the UAL decreased by 230,000.

Amortization base	Original Base	Amortization
1-1-98 Waiver base	245,000	$57{,}738 = 245{,}000 / \ddot{a}_{\overline{5}\vert .0895}$
1-1-98 Method base	230,000	$30{,}605 = 230{,}000 / \ddot{a}_{\overline{10}\vert .07}$

To avoid "interest confusion" in the MFSA, it is a good idea to use an end of year amortization for the waiver, which is 1.0895(57,738) = 62,906. Then you should credit 7% interest on all the other MFSA charges.

1998 Minimum Funding Standard Account

	Charges		Credits	
	Debit balance	57,348	Credit Balance	-0-
	Normal Cost	330,000	Assump amortization	13,306
	IAL amortization	75,314	Method amortization	30,605
	7% interest	32,386	12/31 contribution	x
12/31	Waiver amortization	62,906	7% interest	3,074
	Total charges	557,954	Total credits	x + 46,985

The minimum contribution at 12/31/98 is 557,954 - 46,985 = 510,969.

Answer is D

Problem 36

I. TRUE

See the regulation at 1.410(b)-3(a)(2)(iii)(B):

1.410(b)-3	Employees and former employees who benefit under a plan
1.410(b)-3(a)	Employees benefiting under a plan
1.410(b)-3(a)(2)	Exceptions to allocation or accrual requirement
1.410(b)-3(a)(2)(iii)	Certain employees treated as benefiting
1.410(b)-3(a)(2)(iii)(B)	Certain plan limits

The example in this paragraph is virtually identical to the situation asked in the question.

II. NOT TRUE

See the regulation at 1.410(b)-6(f)(1)(v):

1.410(b)-6	Excludable employees
1.410(b)-6(f)	Certain terminating employees
1.410(b)-6(f)(1)	In general

This paragraph contains six different ways for an employee to be treated as excludable for a plan year. Paragraph (v) reads “The employee terminates with no more than 500 hours of service …”. The question is wrong because of the 1,000 hour threshold.

III. TRUE

See the regulation at 1.410(b)-3(a)(2)(iii)(C):

1.410(b)-3	Employees and former employees who benefit under a plan
1.410(b)-3(a)	Employees benefiting under a plan
1.410(b)-3(a)(2)	Exceptions to allocation or accrual requirement
1.410(b)-3(a)(2)(iii)	Certain employees treated as benefiting
1.410(b)-3(a)(2)(iii)(C)	Benefits previously accrued

The example in this paragraph is virtually identical to the situation asked in the question.

Only I and III are valid

Answer is B

Problem 37 - Page 1 Similar to 1997 #43

§404(a)(7)(A) of the IRC defines the overall deduction limitation for combinations of DB and DC plans. The limit is the greater of 25% of compensation, or the amount paid to the DB plans, not to exceed the minimum contribution requirement for the DB plan under §412. If the actual deduction for a year was equal to the unfunded current liability, the deduction limitation would be no less than that amount.

DB PLAN

First you should calculate the deductible limit for the DB plan. There are relatively few calculations necessary, since you have the Aggregate method with a 12/31 valuation date:

§404 PVNC	=	PVB - AAV		
	=	2,000,000	=	2,500,000 - 500,000
PVE / E	=	10,000 / 1,000	=	10.00
§404 NC	=	200,000		
Limit adj	=	zero		
NC + Limit adj	=	200,000		
ERISA FFL	=	(can't calculate)		
OBRA FFL	=	685,000	=	1.50 * 790,000 - 500,000
RPA FFL	=	211,000	=	.90 * 790,000 - 500,000

The Full Funding Limitation does not apply. The deductible limit will be the greater of the normal cost plus limit adjustments, or the minimum under §412. This is still the Normal cost plus limit adjustments of 200,000.

The final comparison is to the unfunded current liability of 290,000, since this is a non-multiemployer plan with more than 100 participants. The final deductible limit is 290,000. Based on the 12/31 payment of 270,000, there is a zero non-deductible contribution to the DB plan.

DC PLAN

The profit sharing plan has a separate deduction limitation of 15% of taxable compensation. The maximum amount that could be contributed to the profit sharing plan is 15% of 1,000,000, which gives 150,000.

Problem 37 - Page 2 **Revised 07/11/00**

OVERALL DB/DC

The overall deduction limitation is defined as the greater of 25% of taxable compensation, or the minimum contribution requirement for the DB plan. However, if the actual deduction for the DB plan is based on the unfunded current liability, then the overall deduction limitation is defined as the greater of 25% of taxable compensation, and the DB plan unfunded current liability.

25% taxable compensation = .25(1,000,000) = 250,000
DB plan minimum = 200,000
DB plan unfunded current liability = 290,000
DB plan deduction = 270,000

The overall DB/DC plan deduction limit is 270,000. The sum of the actual contributions for the two plans is 270,000 + 120,000 = 390,000. Since this exceeds the overall combined limitation, 120,000 is the non-deductible contribution for both plans for 1998.

The excise tax is NOT based solely on the non-deductible contribution. Under RPA '94, there is an exemption from the excise tax for the lesser of the DC plan contribution, or the first 6% of taxable compensation. This excise tax exemption is only available if there are more than 100 employees covered by the DB plans whose contributions are limited.

This equals the lesser of the 120,000 DC plan contribution, or 6%(1,000,000) = 60,000. The excise tax is 10% of the non-deductible contribution of 120,000 minus the 60,000 which is exempt from the excise tax. The final excise tax is 10%(60,000) = 6,000.

Answer is B

Problem 38 - Page 1

Similar to 1995 #15

Credit balance allocation

Revenue Ruling 81-212 contains acceptable methods used to allocate Minimum Funding Standard Account items when a plan is spun off into two or more plans. 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), or when one of the spun off plans has a zero UAL.

RR 86-47 requires the allocation of the credit balance in a specific manner:

1. Determine the lesser of (MVA - CB) or PV of accrued benefits for the single plan.
2. Allocate the lesser amount between the spun-off plans on a termination basis.
3. Calculate the excess of the market value of assets allocated to each plan over the amount allocated in step 2
4. The credit balance is allocated based on the excess calculated in step 3

For Plan A, the MVA less CB is 500,000 - 80,000, or 420,000. The PV of accrued benefits is 400,000, which is less. You already have the values for PVAB allocated on a plan termination basis. What you need to complete the allocation of the credit balance is the allocated market value of assets.

Market value allocation

IRC §414(l)(2) contains provisions for allocating assets to spun off plans when the assets exceed the present value of accrued benefits on a termination basis, and when the spun off plans are members of the same controlled group. Since the plan sponsor continues to maintain both plans B and C, they remain members of the same controlled group.

You must allocate the "applicable percentage" of the "excess assets" to each spun off plan. The "excess assets" equal the excess of the market value of assets over the present value of accrued benefits on a termination basis. In this problem, the excess assets equal 500,000 - (150,000 + 250,000) = 100,000.

The "applicable percentage" is the ratio for a spun off plan to the total (for the original plan) of the excess, if any, of (I) the lesser of 150% of Current Liability or (normal cost plus accrued liability), over (II) the present value of accrued benefits on a termination basis. This problem gives you values of the liability component of the Full Funding Limitation.

Problem 38 - Page 2

	Market value Allocation: Description of item	Total Plan A	Plan B	Plan C
(1)	Liability component of FFL, lesser of 150% CL or EAN AL	525,000	200,000	325,000
(2)	PV of AB on termination basis	400,000	150,000	250,000
(3)	Excess of (1) over (2)	125,000	50,000	75,000
(4)	Applicable percentage	100%	40%	60%
(5)	Allocated excess assets	100,000	40,000	60,000
(6)	Total allocated assets (2)+(5)	500,000	190,000	310,000

Once you have the total market value of assets, you can finish the allocation of the credit balance:

	Credit balance Allocation: Description of item	Total Plan A	Plan B	Plan C
(1)	Allocated market value	500,000	190,000	310,000
(2)	PV of AB on termination basis	400,000	150,000	250,000
(3)	Excess of (1) over (2)	100,000	40,000	60,000
(4)	Applicable percentage	100%	40%	60%
(5)	Allocated credit balance	80,000	32,000	48,000

The credit balance for plan B is 32,000.

Answer is E

Problem 39 - Page 1 **Revised 07/11/00**

With an Aggregate type cost method, market value of assets, and EAN valuation results, you should check that the Full Funding Limitation (FFL) may apply.

The problem tells you the 12/31/98 contribution is the 1998 deductible limit. The only bases for the limit adjustments are the Initial Accrued Liability and the plan change at 01/01/95.

Limit adjustment = (250,000 + 100,000) / $\ddot{a}_{\overline{10}|.06}$ = 44,862

Deductible limit = (35,000 + 44,862) * (1.06) = 84,654

The next step is to check the Full Funding Limitation under §404.

§404 "ERISA" FFL = (1+i)*(NC + AL - (lesser MVA,AAV))
= 1.06 * (25,000 + 450,000 - 400,000)
= 79,500

§404 "OBRA" FFL = 1.50 (12/31 CL) - (1+i)*(lesser MVA,AAV)) (if no benefit payments)
= 1.50 * 330,000 - 1.06 * 400,000
= 71,000

§404 "RPA 94" FFL = .90 (12/31 CL) - (1+i)*(AAV) (if no benefit payments)
= .90 * 330,000 - 1.06 * 400,000
= -0-

Note that the end of year asset value (if any) should be used in calculating the OBRA and RPA '94 FFL. The reason is that any benefit payments during the year should be reflected at the valuation rate in the assets, and presumably are included in the end of year value. They would be accumulated at the current liability interest rate in the end of year current liability value.

The final §404 FFL value is the greater of the RPA '94 floor, and the lesser of the ERISA and OBRA FFL values, or 71,000. Since the §404 FFL does apply, you do not need to calculate the §412 minimum contribution. The deductible limit is the lesser of the §404 FFL of 71,000, or the greater of the normal cost plus limit adjustments of 84,654 and the minimum contribution. The final result is 71,000, regardless of the magnitude of the minimum contribution.

If you had more than 100 participants, then the final test for the deductible limit would be the Unfunded Current Liability. In this problem you have no information on the participant count. The UCL is zero, so it would not have any effect.

Problem 39 - Page 2

Now you can set up the 1998 MFSA, assuming payment of the 71,000 at 12/31/98:

Amortization base	Original Base	Amortization
1-1-90 IAL base	250,000	$17{,}134 = 250{,}000 / \ddot{a}_{\overline{30}\rceil .07}$
1-1-95 Amend base	100,000	$6{,}854 = 100{,}000 / \ddot{a}_{\overline{30}\rceil .07}$

1998 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	35,000	Credit Balance	5,000
IAL amortization	17,134		
Amend amortization	6,854	12/31 contribution	71,000
6% interest	3,539	6% interest	300
Total charges	62,527	Total credits	76,300

The §412 FFL values will be greater than those under §404 by the amount of the credit balance increased with interest. The §412 FFL will exceed the "AFD", which would equal the charges of 62,527 in this problem. As a result, there is no Full Funding credit under §412, and the final credit balance equals 76,300 - 62,527, or 13,773.

Answer is B

Problem 40 Similar to 1997 #41 **Revised 07/11/00**

In some §404 problems, the hardest thing to get straight is which valuation corresponds to which tax year. Usually you are only given one set of valuation results, which is based on the correct valuation date.

The deductible limit for the taxable year ending 01/31/98 is based on the valuation for the plan year beginning in that tax year. The 07/01/97 valuation should be used to determine the deductible limit needed for the answer to this problem.

The first step should be to calculate the normal cost plus limit adjustments. The ten year amortization bases include the initial accrued liability, and the assumption change.

The deductible limit is the normal cost plus limit adjustments brought forward with interest to the earlier of the end of the plan year, or the end of the tax year, which is 01/31/98:

Limit adjustment = (300,000 +100,000) / $\ddot{a}_{\overline{10}|.07}$ = 53,225

Deductible limit = (50,000 + 53,225) * [1 + (7/12) * .07] = 107,440

The second step is usually to check the Full Funding Limitation under §404. Since you have no market value of assets, you can't check the Full Funding Limitation.

With no experience losses, and a credit balance of 6,000, it is <u>not</u> possible that the minimum contribution would exceed 107,440. You must determine the §412 amortizations to complete the Minimum Funding Standard Account:

IAL amortization = 300,000 / $\ddot{a}_{\overline{30}|.07}$ = 22,594

Assumption amortization = 100,000 / $\ddot{a}_{\overline{10}|.07}$ = 13,306

1998 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	50,000	Credit Balance	6,000
IAL amortization	22,594		
Assump. amortization	13,306	06/30 contribution	107,440
7% interest	6,013	7% interest	420
Total charges	91,913	Total credits	113,860

The credit balance is 113,860 - 91,913 = 21,947.

Answer is A

Problem 41 - Page 1 Similar to 1996 #35 **Revised 06/18/02**

§404(a)(7)(A) of the IRC defines the overall deduction limitation for combinations of DB and DC plans. The limit is the greater of 25% of compensation, or the amount paid to the DB plans, not to exceed the minimum contribution requirement for the DB plan under §412. If the actual deduction for a year was equal to the unfunded current liability, the deduction limitation would be no less than that amount.

DB PLAN

First you should calculate the minimum contribution for the DB plan payable 12/31/98. These calculations are somewhat simplified since 1998 is the initial plan year. Under the Attained Age Normal method, the Initial Unfunded Liability is equal to the Unit Credit Accrued Liability. This is the present value of accrued benefits at 01/01/98.

IAL amortization $25{,}230 = 335{,}000 / \ddot{a}_{\overline{30}|.07}$

12/31 minimum $101{,}896 = (\ 70{,}000 + 25{,}230\ ) * 1.07$

DC PLAN

The profit sharing plan has a separate deduction limitation of 15% of taxable compensation. The taxable compensation is calculated as follows:

	Smith	**Brown**	**Green**	**Others**	**Total**
'98 compensation	180,000	100,000	120,000	625,000	1,025,000
401(a)(17) Limit	160,000	100,000	120,000	625,000	1,005,000

Note: The taxable compensation is limited under 404(l), and the limit has the same value as the 401(a)(17) limit.

The maximum amount that could be contributed to the profit sharing plan is 15% of 1,005,000, which gives 150,750.

Problem 41 - Page 2 **Revised 12/17/02**

OVERALL DB/DC

The overall deduction limitation is defined as the greater of 25% of taxable compensation, or the minimum contribution requirement for the DB plan. However, if the actual deduction for the DB plan is based on the unfunded current liability, then the overall deduction limitation is defined as the greater of 25% of taxable compensation, and the DB plan unfunded current liability.

25% taxable compensation = .25(1,005,000) = 251,250
DB plan minimum = 101,896

The overall DB/DC plan deduction limit is 251,250. The sum of the actual contributions for the two plans is 101,896 + 150,750 = 252,646. Since this exceeds the overall combined limitation, the maximum deductible contribution for the profit sharing plan for 1998 is the total limit less the DB plan contribution: 251,250 - 101,896 = 149,354.

Answer is A

Problem 42

The safe harbor for unit credit plans at 1.401(a)(4)-3(b)(3) requires the plan to meet the 133 1/3% benefit accrual rule of §411(b)(1)(B). This requires that the rate of benefit accrual for any year can be no greater than 4/3 of any earlier year's rate of benefit accrual.

Using the benefit accrual rates of 3.0%, 2.0%, and 2.5%, the value of X must be 4/3 * 2.0% = 2.6667% for service beyond 30 years.

At 01/01/98

Age	65	Birth date	1/1/33
Service	40 years	Hire date	1/1/58
		Normal retirement age	65

5 year average compensation	=	(8,000 + 9,000+ 10,000 + 11,000 + 12,000) / 5
	=	10,000
Accrued benefit at age 65	=	10,000 * (3.0% + 2.0% + 2.5% + 2.67%) * 10
	=	10,167

Since Smith has reached normal retirement age at 01/01/98, the maximum annual accrued benefit is 10,167, subject to the §415 limits. The dollar limit will clearly not apply. The §415(b)(1)(B) compensation limit is reduced when service is less than ten years.

100% 3 year comp. §415 limit	=	(10,000 + 11,000 + 12,000) / 3
	=	11,000

Smith's benefit of 10,167 is not affected by the §415 limits.

Answer is B

Problem 43 Similar to 1997 #25 **Revised 01/07/03**

For a benefit payable at Social Security Retirement Age (SSRA), the maximum permitted disparity is 0.75%. Since you will have employees with all three SSRA values, you should base your calculations on employees with SSRA=67, since that will produce the lowest benefits, and the smallest value of X.

You must derive the value of X that will not exceed the maximum permitted disparity (MPD) factors at each age, for all optional forms of benefit payment. You will have two formulas, one for the 5 year certain and life normal form, and one for the (implied) life annuity optional form. Let ERF_y denote the early retirement reduction factor at each age y:

Normal form: $X\% * (\text{service} < 35) * ERF_y \leq MPD_y * (\text{service} < 35)$
Life annuity form: $X\% * (\text{service} < 35) * ERF_y * 102\% \leq MPD_y * (\text{service} < 35)$

The lowest value of X is for the life annuity form. The resulting value of X will also satisfy the maximum permitted disparity requirement for the normal form:

Life annuity form: $X\% \leq MPD_y / (ERF_y * 102\%)$

Age	SSRA 67 MPD	Early Retirement Factor	Life Annuity Form	Adjusted MPD
	(1)	(2)	(3)	(1) / [(2) * (3)]
67	0.750	1.0000	1.02	0.7353
66	0.700	1.0000	1.02	0.6863
65	0.650	1.0000	1.02	0.6373
64	0.600	0.9333	1.02	0.6303
63	0.550	0.8667	1.02	0.6222
62	0.500	0.8000	1.02	0.6127
61	0.475	0.7333	1.02	0.6350
60	0.450	0.6667	1.02	0.6618

The worst case example is someone who retires at age 62, since this produces the smallest result. Since the plan formula uses the same value of X at all ages, this is the largest allowable value for X.

Answer is B

If the benefit formula accrued service beyond 35 years, you also would have to adjust the MPD on a pro-rata basis. The reason is that there is a cumulative permitted disparity limit, and the MPD is based on a maximum of 35 years of accruals. See 1.401(l)-5(c)(1), which defines the cumulative permitted disparity limit.

Problem 44 - Page 1

This is a complicated PBGC guaranteed benefits question. It tests your knowledge of the five year phase-in for non-owners, as well as the handling of phase-ins for retired employees. Guaranteed benefits are based on the vested accrued benefits of the plan participants. In calculating the guaranteed benefit, remember that changes in vesting schedule, normal retirement age, early retirement reductions, and normal form of annuity payment are all considered as changes in benefit amount subject to the phase in rules.

If there was a change in normal form of benefits, you would have to normalize the benefits. Normalization is the process of converting benefits available under earlier sets of plan provisions to equivalent benefit amounts based on the plan provisions in effect at date of plan termination (DOPT). This is a necessary step, otherwise you would be comparing apples and oranges.

The changes in plan benefits at 01/01/80 and 07/01/91 are subject to phase-ins at the DOPT of 01/01/94. Based on item nine on page 84 of the PBGC study note, use the later of the adoption date and the effective date of the increase for phase-in purposes.

The PBGC maximum monthly guaranteed benefit (MGB) is defined as the lesser of the adjusted ERISA §4022(b) value, or the highest five year consecutive compensation. Smith's final average compensation of 60,000 is much greater than the MGB. The MGB is defined assuming payment on a life annuity basis at age 65.

One key point to this problem is that the MGB does not increase beyond the year of plan termination. See Example 13 in Appendix A of the PBGC study note. You are given the MGB at 1/1/98, since that is Smith's retirement date. A second key point to this problem is that you should use the later of age at DOPT and age at benefit commencement for purposes of adjusting the MGB. See Example 16 in Appendix A of the PBGC study note.

The MGB should be adjusted based on the benefit commencement age (beyond DOPT) of 62. In addition, it must be adjusted to allow for the normal form of 50% J&S. The age 62 adjusted MGB is 2,019.89 = .79 * 2,556.82. After allowing for both the 50% J&S normal form, and the spouse's age difference, the adjusted MGB is 1,672.47 = .92 * .90 * 2,019.89. Based on page 72 of the PBGC study note, it is correct to age adjust the MGB, even when it is based on the highest five year compensation.

A third key point to this problem relates to the service used to calculate the plan benefits. Since DOPT is 1/1/94, all benefit service accruals ceased at that date. When Smith retires at 1/1/98, the service for benefit purposes is 19.5 years (from hire date of 7/1/74 to 1/1/94.) It is consistent that the early retirement reductions are 6% per year, since Smith never accrued the 20 years of service required for unreduced benefits.

Problem 44 - Page 2

	Smith: 5 year phase-ins
Date of birth	01/01/36
01/01/98 age	62
Date of hire	07/01/74
Date of retirement	01/01/98
Years of service	19.5 to 01/01/94 DOPT
Substantial owner?	NO
Vesting percentage	100% based on §411 minimum vesting
01/01/80 Base plan benefit	975.00 = (1% * 60,000 * 19.5) / 12
Early retirement factor	.82 = 1 - (65 - 62) * .06
01/01/80 early retirement benefit	799.50 = .82 * 975.00
Full years plan has been in effect	14
Phase-in	799.50
07/01/91 Base plan benefit	2,925.00 = (3% * 60,000 * 19.5) / 12
Early retirement factor	.82 = 1 - (65 - 62) * .06
07/01/91 early retirement benefit	2,398.50 = .82 * 2,925.00
Maximum Guaranteeable benefit	1,672.47
Guaranteeable benefit increase	872.97 = 1,672.47 - 799.50
Full years plan has been in effect	2
2 year phase-in	349.19 = Greater of 40%(872.97) or $40/mo
Total guaranteed monthly benefit	1,148.69 = 799.50 + 349.19

When calculating the phase-ins, the percent is more valuable when the amount of the Guaranteeable benefit increase exceeds 100. If it is less than 100, then the fixed dollar amount is more valuable. At 100, they both produce the same result.

Answer is B

Problem 45 - Page 1 Similar to 1996 #18

This problem is a typical complicated §415 question. Since the problem states that the DB plan benefit will be reduced if the §415 limits are exceeded, the maximum DB plan fraction equals one minus the DC fraction. You must calculate the DC fraction, and "back into" the maximum projected benefit under the DB plan.

The first step is determination of the DC fraction under §415(e). If the DC plan was established subsequent to Smith's hire date, you could include the years prior to plan inception in the DC fraction denominator (see §415(e)(3)(B), which refers to "each prior year of service with the employer").

Earnings under §415 is not subject to the §401(a)(17) limit of 160,000. Earnings under §415 is defined as total compensation, starting in 1998. It is no longer necessary to make special adjustments when the DC plan includes pre-tax 401(k) deferrals. In this problem, the total earnings for 1997 and 1998 do not exceed the §401(a)(17) limit, so there is no difference between the earnings for plan benefit calculations and §415 limits.

This problem gives you the DC fraction numerator and denominator as of 12/31/92, which saves you the effort of three years of calculations. You need to do 1993 to 1997:

	(1) Total Comp.	(2) 35% Pay: 1.40*25% .25 * (1)	(3) 1.25* 30,000	(4) Lesser of (2), (3)	(5) Annual Additions
1993	80,000	28,000	37,500	28,000	4,500
1994	80,000	28,000	37,500	28,000	6,000
1995	80,000	28,000	37,500	28,000	7,500
1996	150,000	52,500	37,500	37,500	9,000
1997	160,000	56,000	37,500	37,500	9,500
				159,000	36,500

The resulting DC fraction is calculated as
(20,000 + 36,500) ÷ (50,000 + 159,000) = 56,500 ÷ 209,000 = .2703.
The maximum allowable DB fraction equals 1 - .2703 = .7297.

You should be wary of a calculation that shows a DB fraction that exceeds 80%. For a non-top heavy plan, the largest possible DB fraction under §415(e)(2) is 1/1.25 = .8000. This 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. For a top heavy plan, the largest possible DB fraction could be 1.00.

Problem 45 - Page 2

One key point of the problem is that you need to check the §415(b) limits, ignoring the effect of §415(e). The reason is that, due to a different basis for adjustment of the dollar limits, the §415(e) limit does not always produce the lower benefit. Prior to the 1988 TAMRA changes, the §415(e) limit did always produce the lower benefit.

At 01/01/98

Age	64	Birth date	1/1/34
Service	9 years	Hire date	1/1/89
Participation	8 years	Effective date	1/1/90

Early retirement benefit at age 64 = 110,000 (given)

The §415(b)(1)(B) compensation limit is reduced for service less than ten years. The compensation under §415 is not limited by §401(a)(17).

Age 65 100% 3 year comp. §415 limit = [(80,000 + 150,000 + 160,000) / 3] * (9/10)

= 117,000 = 130,000 * .9

Under §415(b), the reduction on the dollar limit is based on years of participation.

Social Security Retirement Age = 65 since born in 1934
Age 64 §415 dollar limit = 130,000 * .933333 * (8/10)
= 97,067

Ignoring the effects of §415(e), Smith's benefit of 110,000 would be limited to the lesser of 117,000 and 97,067, which equals 97,067.Under §415(e), the reduction on the dollar limit in the denominator is based on years of service, not years of participation.

$$\text{DB fraction} = .7297 = \frac{\text{Final projected benefit}}{\left[\begin{array}{c}\text{lesser of } 1.25(130{,}000)(.9333333)(9/10) \\ \text{or } 1.40(130{,}000)(9/10)\end{array}\right]}$$

Max. projected benefit = .7297 [1.25*(130,000) (.9333333)(9/10)]
= 99,599

Since the resulting maximum benefit is greater than the previously calculated maximum of 97,067, the final maximum benefit is 97,067. If you missed this point, the wrong answer of 99,599 is also in the correct answer range. This rarely happens on the exam!

Answer is D

Problem 46 - Page 1 | Similar to 1996 #43 | **Revised 01/05/01**

The point of this problem is that you can't simply ignore the MFSA for 1997, even though you are given the credit balance at 12/31/97. Your main clue would be that this problem is too simple if you only have to set up the MFSA at 01/01/98. The second clue is that you are given information on the Full Funding Limitation for both 1997 and 1998. You need to set up the MFSA at 01/01/97 to determine the effect of the FFL:

1997 Minimum Funding Standard Account

Charges		**Credits**	
		Credit Balance	0
Normal Cost	1,500,000	12/31 contribution	x
8% interest	120,000	8% interest	0
Total charges	1,620,000	Total credits	x

This problem gives you no information regarding the 1997 contribution. Based on the 12/31/97 credit balance of zero, you know that the minimum contribution was paid. You should check the Full Funding Limitation:

§412 "ERISA" FFL = (1+i)*(NC + AL) - (1+i)*[(lesser MVA,AAV) - CB]
= 2,200,000 - 1,000,000
= 1,200,000

§412 "OBRA" FFL = 1.50 (12/31 CL) - (1+i)*[(lesser MVA,AAV) - CB](no benefit payments)
= 1.50*1,300,000 - 1,000,000
= 950,000

§412 "RPA 94" FFL = .90 (12/31 CL) - (1+i)*(AAV) (if no benefit payments)
= .90*1,300,000 - 1,100,000
= 70,000

Note that the end of year asset value (if any) should be used in calculating the OBRA and RPA '94 FFL. The reason is that any benefit payments during the year should be reflected at the valuation rate in the assets, and presumably are included in the end of year value. They would be accumulated at the current liability interest rate in the end of year current liability value. This problem is atypical because the ERISA FFL must be calculated on an end of year basis also, since the problem only gives end of year asset values!

The final §412 FFL value is the greater of the RPA '94 floor, and the lesser of the ERISA and OBRA FFL values, or 950,000. Based on the 12/82 proposed regulation, the Accumulated Funding Deficiency (AFD) based on no contribution and no credit balance must be calculated. This equals the MFSA charges of 1,620,000.

Problem 46 - Page 2 **Revised 01/05/01**

The §412 FFL credit is defined as the excess of the AFD based on zero contribution and zero credit balance over the FFL:

"ERISA" Full Funding Credit = 1,620,000 - 1,200,000
= 420,000
"OBRA" Full Funding Credit = 1,620,000 - 950,000
= 670,000

The last step is that the OBRA Full Funding credit amortization base for the following year is defined as the excess (if any) of the FFC due to the OBRA FFL over the FFC due to the ERISA FFL.

OBRA FFC base = 670,000 - 420,000 = 250,000

This base will be amortized over 10 years starting in 1998: $34,498 = 250,000 \div \ddot{a}_{\overline{10}|.08}$

It is not necessary to finalize the 1997 MFSA. The reason is that you know the minimum contribution was paid for 1997 because the credit balance is zero at 12/31/97. Now you should set up the 1998 MFSA.

1998 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	225,000	Credit Balance	0
FFC amortization	34,498	12/31 contribution	x
8% interest	20,760	8% interest	0
Total charges	280,258	Total credits	x

You should check the Full Funding Limitation again:

§412 "ERISA" FFL = (1+i)*(NC + AL) - (1+i)*[(lesser MVA,AAV) - CB]
= 1,350,000 - 1,150,000
= 200,000

§412 "OBRA" FFL = 1.50 (12/31 CL) - (1+i)*[(lesser MVA,AAV) - CB](no benefit payments)
= 1.50*1,650,000 - 1,150,000
= 1,325,000

§412 "RPA 94" FFL = .90 (12/31 CL) - (1+i)*(AAV) (if no benefit payments)
= .90*1,650,000 - 1,220,000
= 265,000

Problem 46 - Page 3 **Revised 07/11/00**

As mentioned earlier, this problem is atypical because the ERISA FFL must be calculated on an end of year basis also, since the problem only gives end of year asset values! Normally the ERISA FFL definition uses beginning of the year values, which are not adjusted by any benefit payments.

The final §412 FFL value is the greater of the RPA '94 floor, and the lesser of the ERISA and OBRA FFL values, or 265,000. Based on the 12/82 proposed regulation, the Accumulated Funding Deficiency (AFD) based on no contribution and no credit balance must be calculated. This equals the MFSA charges of 280,258.

The §412 FFL credit is defined as the excess of the AFD based on zero contribution and zero credit balance over the FFL:

"ERISA" Full Funding Credit = 280,258 - 265,000
= 15,258

Since the FFL applies in 1998, the 12/31/98 minimum contribution will equal the FFL of 265,000.

Answer is D

If you aren't clear why, here is the final 1998 MFSA:

1998 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	225,000	Credit Balance	0
FFC amortization	34,498	12/31 FFL credit	15,258
		12/31 contribution	x
8% interest	20,760	8% interest	0
Total charges	280,258	Total credits	x + 15,258

The 12/31/98 minimum contribution is 280,258 - 15,258 = 265,000. Algebraically, this is equivalent to AFD - (AFD - FFL), which equals the FFL.

As a footnote to this problem, you could calculate the OBRA Full Funding Credit (FFC) base incorrectly in 1997, and still get the same answer range. If you forgot to subtract the 1997 ERISA FFC, you would have set up the base equal to the OBRA FFC of 650,000. The Full Funding Limitation would still apply in 1998, and give the same 12/31/98 minimum contribution of 265,000.

Problem 47 - Page 1 **Revised 01/05/01**

This is a relatively straightforward PBGC guaranteed benefits question. It tests your knowledge of the five year phase-in for non-owners, as well as the handling of phase-ins for retired employees. Guaranteed benefits are based on the vested accrued benefits of the plan participants. In calculating the guaranteed benefit, remember that changes in vesting schedule, normal retirement age, early retirement reductions, and normal form of annuity payment are all considered as changes in benefit amount subject to the phase in rules.

If there was a change in normal form of benefits, you would have to normalize the benefits. Normalization is the process of converting benefits available under earlier sets of plan provisions to equivalent benefit amounts based on the plan provisions in effect at date of plan termination (DOPT). This is a necessary step, otherwise you would be comparing apples and oranges.

The changes in plan benefits at 01/01/90 and 03/01/95 are subject to phase-ins at the DOPT of 12/31/98. Based on item nine on page 84 of the PBGC study note, use the later of the adoption date and the effective date of the increase for phase-in purposes.

The PBGC maximum monthly guaranteed benefit (MGB) is defined as the lesser of the adjusted ERISA §4022(b) value, or the highest five year consecutive compensation. You have no information on Smith's compensation, so you can ignore it. The MGB is defined assuming payment on a life annuity basis at age 65.

In general, the MGB does not increase beyond the year of plan termination. See Example 13 in Appendix A of the PBGC study note. A key point to this problem is that you should use the later of age at DOPT and age at benefit commencement for purposes of adjusting the MGB. See Example 16 in Appendix A of the PBGC study note.

The MGB should be adjusted based on the age at DOPT (beyond retirement) of 60. In addition, it must be adjusted to allow for the normal form of 100% J&S. The age 60 adjusted MGB is 1,872.44 = (1 - 5(.07) * 2,880.68. After allowing for the 100% J&S normal form, the adjusted MGB is 1,497.95 = .80 * 1,872.44. Based on page 72 of the PBGC study note, it is correct to age adjust the MGB, even when it is based on the highest five year compensation.

One simplifying aspect of this problem is that you are given the monthly benefit amounts. You typically have to determine the accrued benefit and early retirement reduction factors for PBGC guaranteed benefit problems involving retired participants.

Problem 47 - Page 2 **Revised 01/05/01**

	Smith: 5 year phase-ins
Date of birth	01/01/39
01/01/99 age	60
Date of retirement	01/01/97
Substantial owner?	NO
Vesting percentage	100% based on prior retirement
01/01/90 early retirement benefit	1,200.00
Full years plan has been in effect	9
Phase-in	1,200.00
03/01/95 early retirement benefit	1,600.00
Maximum Guaranteeable benefit	1,497.95
Guaranteeable benefit increase	297.95 = 1,497.95 - 1,200.00
Full years plan has been in effect	3
3 year phase-in	178.77 = Greater of 60%(297.95) or $60/mo
Total guaranteed monthly benefit	1,378.77 = 1,200.00 + 178.77

When calculating the phase-ins, the percent is more valuable when the amount of the Guaranteeable benefit increase exceeds 100. If it is less than 100, then the fixed dollar amount is more valuable. At 100, they both produce the same result.

Answer is C