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FALL 1995 EA-2
EXAM SOLUTIONS
(Course P-365U)

Solutions last revised June 20, 2006

See revision history on next page

Fall 1995 EA-2 Exam Solutions

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, 1995.

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.

Revision History:

June 20, 2006	Clarified solution for problems 11 and 14
October 23, 2005	Corrected solution for problem 14
September 5, 2005	Corrected solution for problem 13
July 8, 2005	Clarified solution for problem 28
December 4, 2003	Clarified solution for problem 19
January 8, 2003	Clarified solution for problem 37
June 18, 2002	Corrected problems 32 (page 2), and 40 (page 1)
January 15, 2002	Clarified solution for problem 24
January 07, 2002	Corrected problems 21 and 30
January 10, 2001	Corrected problem 36
July 06, 2000	Corrected problems 14 (page 3), 30, 37, and 41 (page 1)
November 23, 1998	Corrected problems 14 (pages 1-3) and 18
November 2, 1998	Corrected problem 30, pages 1 and 2
September 21, 1998	Corrected problems 04, 11 (page 1), 18, 19, 20 (page 2), 22, 24, 28, and 41
	Corrected answer letters for problems 20, 32, 39, and 41
October 27, 1997	Corrected problem 14, and problem 29
September 24, 1997	Corrected problem 20 (page 1), and 40 (page 1)
September 10, 1997	Corrected problem 32, page 1
September 3, 1997	Corrected problems 12 (page 2), 14 (page 3), 19, and 29
October 5, 1996	Original solutions

Problem 1

FALSE

The §401(l) permitted disparity requirements allow a plan to provide a non-uniform rate of benefit accrual without being deemed discriminatory. A plan must also meet the coverage and general nondiscrimination requirements.

§401(a) contains a ”laundry list” of items that must be satisfied for a plan to be qualified. §401(a)(3) requires that a plan meet the minimum participation standards of §410. §401(a)(4) requires that benefits under the plan not discriminate in favor of the highly compensated employees.

Problem 2

TRUE

There are numerous PBGC reportable events. This question focuses on one of the new reportable events in RPA '94. Here is a list of the new reportable events:

1. Person is no longer member of controlled group after event
2. Liquidation of contributing sponsor or member of controlled group
3. Employer declares extraordinary dividend or redeems 10% of its stock
4. Plan transfers at least 3% of assets outside the controlled group
5. Any other event indicative of need to terminate plan (prescribed by PBGC regs)

There is a special 30 day advance reporting required if all of these conditions are also met:

- Plan is not subject to SEC reporting requirements
- Controlled group unfunded vested benefits liability > $50 million at end of prior plan year
- Funded vested benefit percentage <90%

Problem 3

TRUE

ERISA §4(a) states that Title I applies to any employee benefit plan established or maintained
1. By any employer engaged in commerce (or industry or activity affecting commerce), or
2. By any employee organization representing employees engaged in commerce (or industry or activity affecting commerce), or
3. By both

ERISA §4(b) states that Title I will not apply to any employee benefit plan if it is a
1. Governmental plan
2. Church plan (defined under ERISA §3(33)) which has not elected coverage under IRC §410(d)
3. Plan maintained solely to comply with
   a) Workmen's compensation laws, or
   b) Unemployment compensation laws, or
   c) disability insurance laws
4. Maintained outside of the U.S.A. primarily for benefit of persons substantially all of whom are nonresident aliens
5. Excess benefit plan (defined under ERISA §3(36)), and is unfunded

The trick to this question is an extremely fine point in the regulation at 2510.3-3(b), which states that "… plan under which only partners or a sole proprietor are participants covered under the plan will not be covered under Title I".

Problem 4 **Revised 09/21/98**

FALSE

This is a trick question. In PBGC regulations, there is rarely a reference to highly compensated employees. The various special restrictions apply to substantial owners, who are participants with more than 10% ownership of the company.

It is possible for a majority owner (substantial owners with more than 50% ownership) to waive a portion of their benefit, which would reduce the plan termination liability.

Problem 5

FALSE

The nondiscrimination requirements of §401(a)(4) include both of these items:

- Either the contributions or benefits provided must be nondiscriminatory in amount
- All benefits, rights and features under the plan must be made available in a nondiscriminatory manner

The question tried to fool you into thinking that you only had to meet one of these requirements.

Problem 6

FALSE

In order for a former spouse to receive such payments without the participant's approval, a QDRO (Qualified Domestic Relations Order) must be established.

§401(a)(13)(A) states that a trust is qualified only if "… benefits provided under the plan may not be assigned or alienated". §401(a)(13)(B) states that "… subparagraph (A) shall not apply if the [domestic relations] order is determined to be a qualified domestic relations order".

§414(p)(1)(B)(i) states that "The term domestic relations order means any judgment, decree, or order … which (i) relates to the provision of child support, alimony payments, …". §414(p)(1)(A) defines a qualified domestic relations order as "a domestic relations order (i)which creates or recognizes the existence of an alternate payee's right to … receive all or a portion of the benefits", and which satisfies additional requirements in §414(p)(2) and §414(p)(3).

Problem 7

FALSE

The §410(b) coverage requirements require that a plan satisfy only one of these three requirements:

1. At least 70% of non-highly compensated employees benefit, or
2. The percentage of non-highly compensated employees benefiting is ≥ 70% times the percentage of highly compensated employees who are benefiting, or
3. Average Benefits test:
   a) Plan benefits a non-discriminatory classification of employees, and
   b) Average benefit percentage for non-highly compensated employees is ≥ 70% times average benefit percentage for highly compensated employees

Problem 8

FALSE

In order to get this question right, you either have to know a great deal or relatively little about pension law. The simple answer is “no one is exempt from prohibited transaction rules, are they?” This is not entirely correct, but it produces the right answer.

The more correct answer is that, based on the answer to question 3 of this exam, a plan covering a self-employed person is not subject to the prohibited transaction rules. The reason is that those rules are under Title I of ERISA in §406, and a plan covering a self-employed person is not covered under Title I of ERISA.

The rules regarding taxes for prohibited transactions are contained in Title II of ERISA, in §2003, and in §4975 of the Internal Revenue Code. Apparently, a plan covering a self-employed person is covered under Title II of ERISA, and thus subject to the taxes on prohibited transactions.

Problem 9 - Page 1

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.

Based on the asset information and accrued liability given, the Full Funding Limitation will not apply. You are given the outstanding amortization bases at 01/01/95 (including gain and loss) from the 01/01/94 valuation. You must calculate the gain or loss that occurred during 1994.

You need to use the §412 equation of balance to derive the gain or loss base at 01/01/95:

UAL = O/S §412 bases - credit balance - ARA

You are given the value of the outstanding bases. Based on the information given in this problem, the ARA is zero.

UAL = AL - AAV
= 768,950 - 330,000 = 438,950
O/S Bases = 500,000 - 13,652 + 7,600 - 63,250 = 430,698
438,950 = 430,698 + Loss - 29,624
Loss = 37,876

The main point of this problem is whether you know the amortization periods for the various bases. Using the outstanding bases given in the problem, you can derive the amounts of the amortization charges and credits:

Outstanding base	Remaining years	Amort. Base	Amortization amount
Initial accrued liability	24 = 30-(95-89)	500,000	$500{,}000 / \ddot{a}_{\overline{24}\vert .07} = 40{,}743$
1990 Experience gain	1 = 5-(95-91)	-13,652	$-13{,}652 / \ddot{a}_{\overline{1}\vert .07} = -13{,}652$
1992 Experience loss	3 = 5-(95-93)	7,600	$7{,}600 / \ddot{a}_{\overline{3}\vert .07} = 2{,}707$
1994 Experience loss	5 = 5-(95-95)	37,876	$37{,}876 / \ddot{a}_{\overline{5}\vert .07} = 8{,}633$
1993 Method change	28 = 30-(95-93)	-63,250	$-63{,}250 / \ddot{a}_{\overline{28}\vert .07} = -4{,}870$

Problem 9 - Page 2

1995 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	53,000	Credit Balance	29,624
IAL	40,743	1990 Gain	13,652
1992 Loss	2,707	Method change	4,870
1994 Loss	8,633	12/31 contrib	x
7% interest	7,356	7% interest	3,370
Total charges	112,438	Total credits	x+51,517

The minimum contribution at 12/31/95 is 112,438 - 51,517 = 60,921.

Answer is D

Problem 10

At 01/01/95

Retirement Age	55
Spouse Age	55
Service	15 years
Participation	15 years

With more than 10 years of service and participation, there is no need to reduce the §415 limits. The dollar limit must be reduced to allow for retirement prior to Social Security Retirement Age. For the first three years, the reduction is 6 2/3 % per year. Then the reduction is 5% per year down to age 62. Prior to age 62, the benefit is actuarially reduced.

Without a 100% pre-retirement death benefit, the benefit can be forfeited, and there is a mortality risk involved. The actuarial reduction prior to age 62 is calculated using the ratio of the $N_x^{(12)}$ values, which includes the probability of death.

Social Security Retirement Age	=	66 since born in 1938	
§415 dollar limit during 1995	=	120,000 at age 66	
§415 dollar limit at age 65	=	120,000 * .9333	
§415 dollar limit at age 64	=	120,000 * .8667	
§415 dollar limit at age 63	=	120,000 * .8000	
§415 dollar limit at age 62	=	120,000 * .7500	= 90,000
Actuarial reduction from 62 to 55	=	$N_{62}^{(12)} / N_{55}^{(12)}$	= 5,284 / 9,899 = .533791
§415 dollar limit at age 55	=	90,000 * .533791	= 48,041

The key to this problem is that the §415 dollar limit does not have to be adjusted for a QJ&SA. The last sentence in §415(b)(2)(B) states "… that portion of any joint and survivor annuity which constitutes a qualified joint and survivor annuity (as defined in §417) shall not be taken into account".

The final maximum benefit is 48,041.

Answer is D

This §415 problem seems to be way too easy!

Problem 11 - Page 1 **Revised 06/20/06**

To calculate the required quarterly contribution for 1995, 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.

12/31/94 "MFSA excluding CB" = (10,000+15,000) * 1.07 = 26,750
01/01/95 "MFSA excluding CB" = (12,000+15,000) = 27,000

Lesser of 1994 or 90% of 1995 = Lesser of (26,750 or .90 * 27,000) = 24,300

The required quarterly installment is based on the applicable percentage multiplied by the RAP, which is 25%(24,300) = 6,075.

You may use the credit balance at 01/01/95 like an employer contribution for the required quarterly installment. This is only true if the contribution that creates the credit balance is actually in the trust fund at 01/01/95. The problem states that all contributions for 1994 were paid before 12/31/94, so you can use the credit balance.

Date	Required	Amount Available	Overpayment (Underpayment)
04/15/95	6,075	12,450 * [1+ (.07)*(3.5/12)] = 12,704	12,704 - 6,075 = 6,629
07/15/95	6,075	6,629 * [1+ (.07)*(3/12)] = 6,745	6,745 - 6,075 = 670
10/15/95	6,075	670 * [1+ (.07)*(3/12)] = 682	682 - 6,075 = (5,393)
01/15/96	6,075	-0-	0 - 6,075 = (6,075)

The interest penalty is calculated based on the period of the underpayment, and is applied to the amount of the underpayment. There are two separate underpayments for different periods:

- 5,393 underpayment from 10/15/95 to 09/15/96 (11 months)
- 6,075 underpayment from 01/15/96 to 09/15/96 (8 months)

Using simple interest, the interest penalty is calculated as follows:

5,393 * [(1+(.1406)(11/12)) - (1+(.07)(2.5/12))] = 616
6,075 * [(1+(.1406)(8/12)) - (1+(.07)(0/12))] = 569
1,186

Note that 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 D

Problem 11 - Page 2

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

Date	Required	Amount Available	Overpayment (Underpayment)
04/15/95	6,075	$12{,}450 * (1.07)^{3.5/12}$ = 12,698	12,698 - 6,075 = 6,623
07/15/95	6,075	$6{,}623 * (1.07)^{3/12}$ = 6,736	6,736 - 6,075 = 661
10/15/95	6,075	$661 * (1.07)^{3/12}$ = 672	672 - 6,075 = (5,403)
01/15/96	6,075	-0-	0 - 6,075 = (6,075)

$$5{,}403 * [\,(1.1406)^{11/12} - (1.07)^{2.5/12}\,] = 616$$
$$6{,}075 * [\,(1.1406)^{8/12} - (1.07)^{0/12}\,] = 557$$
$$1{,}173$$

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

Problem 12 - Page 1

At 01/01/95

Age	60	Birth date	01/01/35
Service	6 years	Hire date	01/01/89
Participation	4 years	Participation date	01/01/91

§ 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.

The first step is to calculate the total accrued benefit at 01/01/95:

Accrued benefit = 2.0% * (4 years) * (60,000)
= 4,800

The next step is to calculate each year's employee contributions, and then the amount of the employee provided accrued benefit:

Year	Pay	01/01 EECWI	12/31 contribution	120% A.F.R.	12/31 EECWI calculation
1991	60,000	-0-	2,400	N/A	2,400
1992	60,000	2,400	2,400	8.10%	4,994 = 1.081 * 2,400 + 2,400
1993	60,000	4,994	2,400	7.63%	7,775 = 1.076 * 4,994 + 2,400
1994	60,000	7,775	2,400	6.40%	10,673 = 1.064 * 7,775 + 2,400

Smith is age 60 at 01/01/95, and you have to convert the contribution balance to a benefit at age 65, which is 5 years later. The EECWI is normally accumulated with interest at the first deferred rate for 7 years, interest at the second deferred rate for 8 years, and interest at the third deferred rate thereafter:

EECWI at 65 = $10,673 * (1.0525)^5$
= 13,785

Problem 12 - Page 2

The employee provided annual accrued benefit at age 65 is calculated by dividing by the annuity value at the immediate interest rate of 6%:

13,785 ÷ 9.35 = 1,474

The question asks for the vested annual accrued benefit. The employee provided portion is always 100% vested, and the remaining accrued benefit is subject to the plan's vesting schedule. With six years of service, Smith is 80% vested.

100% (1,474) + 80% (4,800 - 1,474) = 1,474 + 2,661 = 4,135

Answer is D

Problem 13 - Page 1 **Revised 09/05/05**

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.

You are told that there was an ERISA Full Funding credit in 1994. That means all prior bases were considered fully amortized at 12/31/94. This means that the equation of balance no longer "works". You are NOT told to use the Fresh Start alternative, which produces an unusual problem. You are not given the Initial Accrued Liability, so you can't determine the limit adjustments for the deductible limit.

I will assume that the prior §404 bases have been eliminated at 12/31/94. You must set the §404 loss base for 1994 equal to the §404 UAL at 01/01/95. This is required in order to satisfy the "§404 balance equation":

§404 Loss base = §404 UAL
= §404 AL - 404 AAV
= 210,000 - 180,000
= 30,000

The end result is that it looks like we used the Fresh Start alternative to calculate the deductible limit. We really did not do that. After satisfying the "§404 balance equation", we have the same results as the Fresh Start alternative.

The first step in the deductible limit calculations is calculating the normal cost plus limit adjustments. 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 = $30{,}000 / \ddot{a}_{\overline{10}|.07}$
= 3,992

Deductible limit = (10,000 + 3,992)*(1.07)
= 14,971

The next step is to check the Full Funding Limitation under §404. It should be clear that the FFL will not apply:

§404 "ERISA" FFL = (1+i)*(PUC AL + NC - (lesser MVA,AAV))
= 1.07*(210,000+10,000-180,000)
= 42,800

§404 "OBRA" FFL = 1.50 (12/31 CL) - (1+i)*(lesser MVA,AAV))
= 1.50*198,500 - 183,000
= 114,750

Problem 13 - Page 2 **Revised 09/05/05**

Note that the end of year asset value is used in calculating the OBRA 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 minimum contribution under §412 will exceed the normal cost plus limit adjustments. The reason is that the loss is amortized over five years for §412, and over 10 years for §404.

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, and when all of the prior amortization bases have been eliminated due to the (ERISA) Full Funding Credit. 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.

UAL	=	O/S §412 bases - credit balance - ARA (assumed zero)
UAL	=	30,000 = 210,000 - 180,000
30,000	=	Loss base - 2,000
Loss base	=	32,000
Amortization	=	7,294 = 32,000 ÷ $\ddot{a}_{\overline{5}\vert .07}$

1995 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	10,000	Credit Balance	2,000
1994 Loss	7,294	12/31 contrib	x
7% interest	1,211	7% interest	140
Total charges	18,505	Total credits	x+2,140

The minimum contribution at 12/31/95 is 18,505 - 2,140 = 16,365.

The FFL under §412 should not apply, since the value will be 1.07(2,000) greater than that calculated under §404. 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 charges of 18,505. The §412 FFL credit is defined as the excess of the AFD based on zero contribution and zero credit balance over the FFL. There is no FFL credit.

The last step in calculating the maximum deductible limit is to check the Unfunded Current Liability. Since this plan has always had more than 100 participants, the plan sponsor can contribute and deduct an amount equal to the Unfunded Current Liability. Since this value is 198,500 - 183,000 = 15,500, the final deductible limit appears to be equal to the minimum of 16,365.

Answer is E

Problem 14 - Page 1 **Revised 10/23/05**

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.

The accumulated reconciliation account (ARA) consists of the accumulation of the §412(l) additional funding charge (AFC), §412(m) late quarterly contribution penalties, and the additional amortization paid for waivers. The problem states that the minimum contributions for 1994 and 1995 were both paid at the end of the year. You are given the quarterly contribution penalty for 1994, and you must calculate the penalty for 1995. Since the plan has less than 100 participants, it is not subject to the §412(l) AFC.

First, you must set up the minimum funding standard account for 1994, and check to see if the FFL applied. Based on Q.4 of Notice 89-52, if the FFL applies for a year, you should use the FFL in calculating the Required Annual payment (instead of the absolute minimum in the MFSA.)

You should try to include any 412(m) charge in calculating the RAP. You can only do this for last year's MFSA. You may not know the final value of last year's 412(m) charge until 8½ months after the end of the plan year, or 4 months after the first quarterly contribution due date.

1994 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	50,000	Credit Balance	-0-
IAL amort	10,000	12/31 contrib	x
7% interest	4,200	7% interest	-0-
§412(m) charge	2,000		
Total charges	66,200	Total credits	x

The next step is to check the Full Funding Limitation under §412:

§412 "ERISA" FFL = (1+i)*(EAN AL + NC - (lesser MVA,AAV- CB))
= 1.07 * (300,000 + 50,000 - (40,000 - 0))
= 331,700

§412 "OBRA" FFL = 1.50 (12/31 CL) - (1+i)*(lesser MVA,AAV-CB))
= 1.50 * 75,000 - 1.07 * (40,000 - 0)
= 69,700

The FFL under §412 does not apply for 1994. 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 charges of 66,200. The §412 FFL credit is defined as the excess of the AFD based on zero contribution and zero credit balance over the FFL. There is no FFL credit.

Problem 14 - Page 2 **Revised 11/23/98**

You are given the net MFSA amortization charges at 1/1/94 and 1/1/95. You can skip the calculation of the experience gain or loss for 1994. If you want to do the calculation, you will discover that the net G/L is zero.

Next, you must set up the minimum funding standard account for 1995, and check to see if the FFL applied. Based on Q. 4 of Notice 89-52, if the FFL applies for a year, you should use the FFL in calculating the Required Annual Payment (instead of the absolute minimum in the MFSA.)

1995 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	52,000	Credit Balance	-0-
IAL amort	10,000	12/31 contrib	x
7% interest	4,340	7% interest	-0-
Total charges	66,340	Total credits	x

The next step is to check the Full Funding Limitation under §412:

§412 "ERISA" FFL = (1+i)*(EAN AL + NC - (lesser MVA,AAV- CB))
= 1.07 * (374,500 + 52,000 - (109,000 - 0))
= 339,725

§412 "OBRA" FFL = 1.50 (12/31 CL) - (1+i)*(lesser MVA,AAV-CB))
= 1.50 * 110,000 - 1.07 * (109,000 - 0)
= 48,370

The FFL under §412 does apply for 1995. 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 charges of 66,340. The §412 FFL credit is defined as the excess of the AFD based on zero contribution and zero credit balance over the FFL, which equals 66,340 - 48,370 = 17,970.

Problem 14 - Page 3 **Revised 06/20/06**

Now you can calculate the required quarterly contribution, and the penalty charge at 12/31/95. To calculate the required quarterly contribution for 1995, 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.

Since the FFL applies for 1995, you should use it as the value of the 1995 minimum. You should adjust it back to 01/01/95, which is consistent with the RAP methodology.

12/31/94 "MFSA excluding CB"	=	(10,000+50,000)*1.07 + 2,000	= 66,200
01/01/95 "MFSA excluding CB"	=	(48,370) ÷ 1.07	= 45,206
Lesser of 1994 or 90% of 1995	=	Lesser of (66,200 or .90 * 45,206)	= 40,685

The required quarterly installment is based on the applicable percentage multiplied by the RAP, which is 25%(40,685) = 10,171.

With no credit balance at 01/01/95, and no contribution until 12/31/95, there will be three underpayments of equal amounts of 10,171, each with a different period of underpayment:

Date	Required	Amount Available	Overpayment (Underpayment)	Cumulative Overpayment (Underpayment)
04/15/95	10,171	-0-	(10,171)	(10,171)
07/15/95	10,171	-0-	(10,171)	(20,342)
10/15/95	10,171	-0-	(10,171)	(30,513)
12/31/95	-0-	48,370	48,370	17,857
01/15/96	10,171	17,857	7,686	7,686

The interest penalty is calculated based on the period of the underpayment, and is applied to the amount of the underpayment. There are three separate underpayments for different periods:

- 10,171 underpayment from 04/15/95 to 12/31/95 (8.5 months)
- 10,171 underpayment from 07/15/95 to 12/31/95 (5.5 months)
- 10,171 underpayment from 10/15/95 to 12/31/95 (2.5 months)

Problem 14 - Page 4

Using simple interest, the interest penalty is calculated as follows:

10,171 *	[(1+(.1406)(8.5/12))	- (1+(.07)(8.5/12))	] =	509
10,171 *	[(1+(.1406)(5.5/12))	- (1+(.07)(5.5/12))	] =	329
10,171 *	[(1+(.1406)(2.5/12))	- (1+(.07)(2.5/12))	] =	150
				988

If the underpayment period extended 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.

The value of the ARA at 12/31/95 is 1.07(2,000) + 988 = 3,128.

Answer is B

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

10,171 *	$[(1.1406)^{8.5/12}$	$- (1.07)^{8.5/12}$	] =	494
10,171 *	$[(1.1406)^{5.5/12}$	$- (1.07)^{5.5/12}$	] =	312
10,171 *	$[(1.1406)^{2.5/12}$	$- (1.07)^{2.5/12}$	] =	138
				944

The resulting ARA of 3,084 is in the same range, as it must be!

NOTE: If you ignore the FFL for 1995, you will get a value of 1,295 for the interest penalty for 1995 (compound interest). This will give an ARA of 3,435, which is in the wrong answer range!

Problem 15 - Page 1

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 - 300,000 = 200,000.

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 at the end of the plan year, so the Accrued Liability figures include the normal cost.

	Description of item	Total Plan A	Plan B	Plan C
(1)	Liability component of FFL, lesser of 150% CL or EAN AL	400,000	150,000	250,000
(2)	PV of AB on termination basis	300,000	100,000	200,000
(3)	Excess of (1) over (2)	100,000	50,000	50,000
(4)	Applicable percentage	100%	50%	50%
(5)	Allocated excess assets	200,000	100,000	100,000
(6)	Total allocated assets (2)+(5)	500,000	200,000	300,000

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), and when one of the spun off plans has a zero UAL.

Problem 15 - Page 2

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 - 75,000, or 425,000. The PV of accrued benefits is 300,000, which is less. You already have the values for PVAB allocated on a plan termination basis.

	Description of item	Total Plan A	Plan B	Plan C
(1)	Allocated market value	500,000	200,000	300,000
(2)	PV of AB on termination basis	300,000	100,000	200,000
(3)	Excess of (1) over (2)	200,000	100,000	100,000
(4)	Applicable percentage	100%	50%	50%
(5)	Allocated credit balance	75,000	37,500	37,500

Answer is A

Problem 16

I. FALSE

See question T-26 in the §1.416-1 regulations. In general, the assumptions used to calculate the present value of accrued benefits must be reasonable. They do not have to be related to actual experience, the assumptions used for funding, or the assumptions used for calculating optional forms of benefit payment.

II. TRUE

This is a minor point that is in §416(i). The minimum vesting and minimum benefit requirements do not apply to collectively bargained plans.

III. TRUE

This is a tiny detail from question T-31 in the §1.416-1 regulations: “benefits paid on account of death are not treated as distributions for purposes of §416(g)(3) to the extent such benefits exceed the present value of accrued benefits existing immediately prior to death”.

II and III only are true.

Answer is C

Problem 17 - Page 1

This problem is a typical complicated §415 question. This is a top-heavy plan, which normally means that the §415(e) DB and DC fraction denominators would be reduced. For a plan that is super top heavy (or is top heavy and does not provide the top heavy minimums), the dollar limit will be multiplied by 1.00 instead of 1.25.

In §416, the top heavy minimum benefit accrual rate is 2% times years of top heavy service. This must be increased to 3% in order to use the 125% denominator under §415(e). Since the plan's normal benefit accrual rate is 10% per year of service, you can use the 125% denominators under §415(e).

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.

At 01/01/95		**At 01/01/2000**	
Age	57	Age	62
Service	3 years	Service	8 years
Participation	3 years	Participation	8 years

The §415 limits have to be reduced for service (or participation) less than ten years. Under §415(b), the reduction on the dollar limit is based on years of participation.

Age 62 FAE5	=	100,000
Projected plan benefit (no limitations)	=	100,000 * 10% * 8 years
	=	80,000
Age 62 100% 3 year comp. §415 limit	=	100,000 * 8/10
	=	80,000
Social Security Retirement Age	=	66 since born in 1938
Age 62 §415 dollar limit	=	120,000 * 8/10 * .75
	=	72,000

Ignoring the effects of §415(e), Smith's benefit would be limited to the lesser of 80,000 or the lesser of 80,000 and 72,000, which equals 72,000.

Problem 17 - Page 2

The next step is determination of the DC fraction under §415(e). The problem tells you to project this fraction to the assumed retirement age of 62, and that there are no assumed compensation increases. Since the DC plan was established subsequent to Smith's hire date, you can 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").

	(1) Annual pay	(2) 35% Pay: 1.40*25%	(3) 125%* 30,000	(4) Lesser of (2) and (3)	(5) Annual Additions
1992	80,000	28,000	37,500	28,000	-0-
1993	90,000	31,500	37,500	31,500	-0-
1994	100,000	35,000	37,500	35,000	-0-
1995	100,000	35,000	37,500	35,000	20,000
1996	100,000	35,000	37,500	35,000	20,000
1997	100,000	35,000	37,500	35,000	20,000
1998	100,000	35,000	37,500	35,000	20,000
1999	100,000	35,000	37,500	35,000	20,000
				269,500	100,000

The resulting DC fraction is 100,000 ÷ 269,500 = .371085. The maximum allowable DB fraction equals 1 - .371058 = .628942.

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.

Under §415(e), the reduction on the dollar limit in the denominator is based on years of service, not years of participation. In this problem, it makes no difference in the calculation.

$$\text{DB fraction} = 62.8942\% = \frac{\text{Final projected benefit}}{[\text{ lesser of } 1.25(72{,}000) \text{ or } 1.40(80{,}000)]}$$

$$\text{Final projected benefit} = 62.8942\% [1.25(72{,}000)]$$
$$= 56{,}605$$

This benefit under §415(e) is lower than the previously calculated 72,000. The final maximum benefit is 56,605.

Answer is C

Problem 18 **Revised 11/23/98**

This is the first RPA '94 question asked on the exam. The optional rule is not used, which requires you to calculate a separate layer of additional Unfunded Old Liability (UOL). The new layer is the total current liability (based on mandated mortality and interest rates) less the current liability calculated based on these assumptions:

- Mortality used for current liability in 1993 valuation
- Interest used for current liability in 1993 valuation, multiplied by (a) over (b)
  (a) 48 month average of 30 year Treasury security yields for 1995
  (b) 48 month average of 30 year Treasury security yields for 1993

You are told that the mortality used in 1993 for current liability was the UP-1984 table. The modified interest rate for calculating the current liability is 8.88% * (7.26% ÷ 8.07%), or 7.99%. You can pick out the current liability on this basis from the second table as 890,000. The total current liability in 1995 based on the mandated 1983 GAM table and the 7.91% interest is 1,000,000.

The difference between these two values is 110,000, which is the new layer of additional UOL. This should be amortized over 12 years (= 18-(95-89)) at the 7.91% rate, which gives the amortization amount as 13,463.

Answer is C

If the problem had said the employer elected the optional rule, then you would calculate the new layer of additional UOL as the difference between the total current liability (based on mandated mortality and interest rates) and the outstanding balance of the UOL. This is a much easier calculation, but it requires information not given in this problem. The amortization would still be 12 years (as shown above).

When the employer elects the optional rule, then there is a floor that must be applied to the resulting §412(l) AFC. It can not be lower than the §412(l) AFC based on the pre-RPA '94 rules.

Problem 19 **Revised 12/04/03**

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% * (service < 35) * ERF_y	≤	MPD_y * (service < 35)
Life annuity form:	X% * (service < 35) * ERF_y * Adj%	≤	MPD_y * (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%	≤	MPD_y / (ERF_y * Adj%)

Age	SSRA 67 MPD	Early Retirement Factor	Life Annuity Form	Adjusted MPD
	(1)	(2)	(3)	(1) / [(2) * (3)]
67	0.750	1.00	1.0325	0.7264
66	0.700	1.00	1.0300	0.6796
65	0.650	1.00	1.0275	0.6326
64	0.600	1.00	1.0250	0.5854
63	0.550	1.00	1.0225	0.5379
62	0.500	1.00	1.0200	0.4902
61	0.475	0.76	1.0175	0.6143
60	0.450	0.70	1.0150	0.6334

The worst case example is someone who retires at age 62, since this produces the smallest result (49.02%). Since the plan formula uses the same value of X at all ages, this is the largest allowable value for X.

Answer is A

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 20 - Page 1 **Revised 09/24/97**

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.

The first step is to complete the MFSA for 1994. This will give you the 1995 MFSA credit balance.

IAL Amort. = 21,465 = 285,000 ÷ $\ddot{a}_{\overline{30}|.07}$

1994 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	65,000	Credit Balance	-0-
IAL Amort	21,465	09/30 contrib	100,000
7% interest	6,053	7% interest	1,750
Total charges	92,517	Total credits	101,750

The interest on the 100,000 contribution was calculated as (3/12) * .07 * 100,000. The credit balance at 12/31/94 (based on simple interest) is 101,750 - 92,517 = 9,233.

Since this is a brand new plan, the FFL is so large that it will not apply. You have to calculate the experience G/L during 1994. You must determine the expected UAL at 01/01/95, as well as the actual UAL at 01/01/95 before the plan amendment. The difference between those two values is the experience gain or loss base.

$01/95\ {}_eUAL_1$ = (1+i)*(NC_0 + UAL_0) - (contrib + i)
= 1.07 * (65,000 + 285,000) - 100,000 * (1 + (3/12)*(.07))
= 374,500 - 101,750
= 272,750

01/01/95 UAL = 565,000 - 103,000 = 462,000
Old plan UAL = 462,000 - 140,000 = 322,000

Loss base = 322,000 - 272,750 = 49,250
Amortization = 11,226 = 49,250 ÷ $\ddot{a}_{\overline{5}|.07}$

Plan change = 140,000 (given)
Amortization = 10,544 = 140,000 ÷ $\ddot{a}_{\overline{30}|.07}$

Problem 20 - Page 2 **Revised 09/21/98**

1995 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	98,000	Credit Balance	9,233
IAL Amort	21,465		
1994 Loss	11,226	12/31 contrib	x
Plan change	10,544		
7% interest	9,886	7% interest	646
Total charges	151,121	Total credits	x+9,879

The minimum contribution at 12/31/95 is 151,121 - 9,879 = 141,242 (based on simple interest).

Answer is D

Compound interest solution

The interest credit on the 09/30/94 contribution in the 1994 MFSA would be 1,706. The resulting credit balance at 12/31/94 is 9,189.

The expected UAL is 272,794, which produces an experience loss of 49,206. The amortization for the loss is 11,216.

This produces charges of 151,110 and credits of x+9,832 in the 1995 MFSA, and a minimum contribution of 141,278 at 12/31/95.

Problem 21 **Revised 01/07/02**

This is a typical PBGC guaranteed benefits question. It tests your knowledge of the 30 year phase-in of guaranteed benefits for substantial owners, and the five year phase-in for non-owners. 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, and normal form of annuity payment are all considered as changes in benefit amount that are 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 change in plan benefits at 01/01/94 is subject to phase-ins at the DOPT of 12/31/95. For Brown, the new benefits have been in effect for two full years at DOPT. Since Smith is a substantial owner (>10%), even the 01/01/90 plan benefit is subject to the 30 year phase-ins.

	Smith: 30 year phase-ins	**Brown: 5 year phase-ins**
Date of birth	01/01/30	01/01/50
01/01/96 age	66	46
Date of hire	01/01/60	01/01/90
Past service	36	6
Substantial owner?	YES	NO
Vesting percentage	100%	100%
01/01/90 Base plan benefit	36($25) = 900	6($25) = 150
Years plan has been in effect	6	6
Phase-in	(6/30)*(900) = 180.00	150
01/01/94 Base plan benefit	36($33) = 1,188	6($33) = 198
Guaranteeable benefit increase	1,188 - 900 = 288	198 - 150 = 48
Years plan has been in effect	2	2
Phase-in	(2/30)*(288) = 19.20	40% or $40 = 40.00
Total guaranteed benefit	180.00 + 19.20 = 199.20	150.00 + 40.00 = 190.00

$\sum$ = 389.20

Answer is C

Problem 22 **Revised 09/21/98**

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 have neither, so you can ignore it.

You must calculate the 01/01/95 UAL, which will allow you to calculate the Attained Age Normal cost. Since the deductible limit has been paid at 03/31 each tax year, the UAL has decreased each year based on a ten year interest amortization:

UAL = O/S §404 Ten year amortization bases
= IAL * ($\ddot{a}_{\overline{2}|.07}$ / $\ddot{a}_{\overline{10}|.07}$)
= 490,000 * (1.9346 / 7.5152)
= 126,136

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

§404 PVNC	=	PVB - UAL - AAV
	=	900,000 - 126,136 - 700,000
	=	73,864
PVE / E	=	1,500 / 250 = 6.0
§404 NC	=	12,311

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 01/01/95 valuation results to determine the deductible limit for the tax year ending 03/31/95. You should credit three months interest on the normal cost plus limit adjustments.

Limit adjustment = IAL / $\ddot{a}_{\overline{10}|.07}$
= 490,000 / 7.5152
= 65,201

Deductible limit = (12,311 + 65,201) * [1 + (3/12)*(.07)]
= 78,868

Answer is B

On a compound interest basis, the answer is

Deductible limit = (12,311 + 65,201) * $(1.07)^{3/12}$
= 78,834

Problem 23

At 01/01/95

Age	55	Birth date	01/01/40
Service	11 years	Hire date	01/01/84
Participation	11 years	Participation date	01/01/84

Under the Projected unit credit method, the normal cost and accrued liability are defined based on the "funding accrued benefit" (FAB). The FAB is determined as the projected benefit multiplied by a ratio. The ratio is (past service)/(total service), where the years of service are weighted based on rates of benefit accrual.

The plan's FAB at 01/01/95 is equal to 12 times 75 times Smith's service from the 01/01/84 hire date:

Plan FAB = 12(75)(11)
= 9,900

In IRC Section 416, the Top Heavy (T-H) minimum benefit accrual rate is 2%. This must be increased to 3% in order to use the 125% denominator under IRC Section 415(e). 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 01/01/95:

FAE5 = 40,000
T-H FAB = 40,000(.03)(10)
= 12,000

The final FAB at 01/01/95 is the greater of the plan FAB or the T-H FAB. The accrued liability is the present value of the final FAB:

Final FAB = greater of 9,900 and 12,000, which equals 12,000

$$\text{Accrued Liability} = 12{,}000 * \ddot{a}_{65}^{(12)} * \frac{D_{65}}{D_{55}}$$

$$= 12{,}000 * 10.0 * (1.07)^{-10}$$

$$= 61{,}002$$

Answer is D

Problem 24 **Revised 01/15/02**

I. FALSE

§1.401(a)(4)-4 Nondiscriminatory availability of benefits, rights, and features.
§1.401(a)(4)-4(b) Current availability
§1.401(a)(4)-4(b)(2) Determination of current availability
§1.401(a)(4)-4(b)(2)(ii) Certain conditions disregarded
§1.401(a)(4)-4(b)(2)(ii)(A) Certain age and service conditions
§1.401(a)(4)-4(b)(2)(ii)(A)(I) General rule

" … any specified age and service condition with respect to an optional form of benefit or a social security supplement is disregarded in determining whether the optional form of benefit or social security supplement is currently available."

II. TRUE

§1.404(a)(4)-3 Nondiscrimination in amount of employer-provided benefits under a DB plan
§1.404(a)(4)-3(b) Safe harbors
§1.404(a)(4)-3(b)(2) Uniformity requirements
§1.404(a)(4)-3(b)(2)(iii) Uniform subsidies

"Each subsidized optional form of benefit available under the plan must be currently available (within the meaning of §1.404(a)(4)-4(b)(2)) to substantially all employees."

III. FALSE

§1.404(a)(4)-4 Nondiscriminatory availability of benefits, rights, and features.
§1.404(a)(4)-4(a) Introduction

This is a trick question. The wording in the question says "or", but the regulation says "and": "Benefits, rights, and features … are made available to employees in a nondiscriminatory manner only if each benefit, right, or feature satisfies the current availability requirement of paragraph (b) of this section and the effective availability requirement of paragraph (c) of this section."

II only is true.

Answer is B

Problem 25

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 have neither, 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. Since the plan year and the tax year are the same by default, you should credit a full year's interest on the normal cost plus limit adjustments.

The only trick to this problem is that you do not set up a §404 base due to the OBRA Full Funding Credit. This item has been tested numerous times on this exam!

Limit adjustment = IAL / $\ddot{a}_{\overline{10}|.07}$

= 900,000 / 7.5152

= 119,757

Deductible limit = (120,000 + 119,757) * 1.07

= 256,540

Now you must calculate the §412 amortizations, and complete the MFSA:

IAL amortization = 900,000 / $\ddot{a}_{\overline{30}|.07}$ = 67,783

1993 FFC amort. = 15,000 / $\ddot{a}_{\overline{10}|.07}$ = 1,996

1994 FFC amort. = 5,000 / $\ddot{a}_{\overline{10}|.07}$ = 665

1995 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	120,000	Credit Balance	100,000
IAL Amort	67,783		
1993 FFC	1,996	01/01 contrib	256,540
1994 FFC	665		
7% interest	13,331	7% interest	24,958
Total charges	203,775	Total credits	381,498

The credit balance at 12/31/95 is 381,498 - 203,775 = 177,722.

Answer is C

Problem 26 - Page 1

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.

At 01/01/95

Age	65	Birth date	01/01/30
Service	4 years	Hire date	01/01/91
Participation	4 years	Effective date	01/01/90

The first step is determination of the DC fraction under §415(e). Since the DC plan was established subsequent to Smith's hire date, you can include the year 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 defined as the taxable compensation, which excludes the 401(k) deferrals. Earnings under §415 is not subject to the §401(a)(17) limit of 150,000. Note that the definition of the employer's profit sharing contribution is 10% of total compensation.

	(1) Total Comp.	(2) 401(k) Deferrals	(3) Taxable Comp. (1) - (2)	(4) 35% Pay: 1.40*25% .25*(3)	(5) 1.25* 30,000	(6) Lesser of (4), (5)	(7) ER match + Contrib. (2)+.10*(1)	(8) Annual Additions (2) + (7)
1991	90,000	-0-	90,000	31,500	37,500	31,500	-0-	-0-
1992	100,000	5,000	95,000	33,250	37,500	33,250	15,000	20,000
1993	110,000	5,500	104,500	36,575	37,500	36,575	16,500	22,000
1994	115,000	5,750	109,250	38,238	37,500	37,500	17,250	23,000
						138,825		65,000

The resulting DC fraction is 65,000 ÷ 138,825 = .468215. The maximum allowable DB fraction equals 1 - .468215 = .531785.

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 26 - Page 2

The §415 DB plan limits have to be reduced for service (or participation) less than ten years. Under §415(b), the reduction on the dollar limit is based on years of participation.

Age 65 100% 3 year compensation	=	(95,000 + 104,500 + 109,250) / 3
	=	102,917
Age 65 100% 3 year comp. §415 limit	=	102,917 * (4/10)
	=	41,167

Social Security Retirement Age	=	65 since born in 1930
Age 65 §415 dollar limit	=	120,000 * (4/10)
	=	48,000

Ignoring the effects of §415(e), Smith's benefit would be limited to the lesser of 41,167 and 48,000, which equals 41,167.

Under §415(e), the reduction on the dollar limit in the denominator is based on years of service, not years of participation. In this problem, it makes no difference in the calculation.

$$\text{DB fraction} = 53.1785\% = \frac{\text{Final projected benefit}}{[\text{ lesser of } 1.25(120{,}000)(.4) \text{ or } 1.40(102{,}917)(.4)]}$$

Max. projected benefit	=	53.1785% [1.40(102,917)(.4)]
	=	30,649

Since the resulting maximum benefit is less than the previously calculated maximum of 41,167, the final maximum benefit is 30,649.

Answer is C

Problem 27 - Page 1

The three benefit accrual rules must be tested for each formula. For a formula to fail the tests, it has to fail all three rules. For each of these tests the projected NRB is based on service continuing to NRA. The tests are designed to prevent plans which are heavily back-loaded. There is nothing wrong with a plan that has higher rates of benefit accrual for the early years of service.

§411(b)(1)(A) Three percent Rule

The minimum accrued benefit is 3% times years of participation (< 33.33) times the projected NRB. The NRB is based on the earliest possible entry age, with service to the earlier of 65 or NRA. If benefits are based on pay, use the highest 10 year final average earnings.

§411(b)(1)(B) 133 1/3 percent Rule

The rate of benefit accrual for later plan years can't exceed 133 1/3 percent of the rate for earlier plan years. Any amendment to the plan which is in effect for the current year should be treated as in effect for all plan years.

§411(b)(1)(C) Fractional Rule

The minimum accrued benefit is a fraction times the NRB. The NRB is based on level future pay equal to compensation that would be used to calculate the NRB for exit today. The fraction is the ratio of years of participation at separation to years of participation at NRA.

In general, none of the formulas will satisfy the pro-rata rule. The reason is that the plan's accrued benefit must be defined based on the pro-rata rule in order to pass! The 133 1/3% rule is very easy to test, so the only work you must do is for the 3% rule.

I. .75% for first 10 years, 1.25% for next 20 years, 0% thereafter

This formula does not satisfy the 133 1/3% rule, since 1.25% is more than 1.333 * .75% = 1.0%. This formula does not satisfy the fractional rule.

The projected NRB for a participant who enters before age 35 is .75%(10) + 1.25%(20) which equals 32.5%. The benefits should accrue at the rate of .03(32.5%) or .975% per year. After the first year, the accrued benefit should be at least .975%, but it is only .75%.

This formula does not satisfy the 3% rule, so it fails the benefit accrual tests.

Problem 27 - Page 2

II. 300 for first 10 years, 450 for next 10 years, 0 thereafter

This formula does not satisfy the 133 1/3% rule, since 450 is more than 1.333 * 300 = 400.
This formula does not satisfy the fractional rule.

The projected NRB for a participant who enters before age 35 is 300(10) + 450(10) which equals 7,500. The benefits should accrue at the rate of .03(7,500) or 225 per year. The actual accrued benefit always accrues at a faster rate.

This formula satisfies the 3% rule.

III. 0.75% for first 10 years, 1.0% for next 10 years, 1.25% for next 10 years, 0% thereafter

This formula does not satisfy the 133 1/3% rule, since 1.25% is more than 1.333 * .75% = 1.0%.
This formula does not satisfy the fractional rule.

The projected NRB for a participant who enters before age 35 is .75%(10) + 1.0%(10) + 1.25%(10) which equals 30.0%. The benefits should accrue at the rate of .03(30%) or .9% per year. After the first year, the accrued benefit should be at least .9%, but it is only .75%.

This formula does not satisfy the 3% rule, so it fails the benefit accrual tests.

Formula II is the only one to satisfy the minimum benefit accrual rules.

Answer is B

Problem 28 **Revised 07/08/05**

With an individual type cost method, you should always check if experience gains and losses have occurred, and if the Full Funding Limitation (FFL) applies. You have no market value of assets, so you can't check the FFL.

You are told there were no G/L before 1994, but you should calculate the G/L for 1994. You can use the §412 UAL figures to do these calculations, since the G/L base is the same for §412 and §404.

$$
\begin{aligned}
01/95\ {}_eUAL_1 &= (1+i)*(\ NC_0 + UAL_0\ ) - (\ \text{contrib} + i\ ) \\
&= 1.07 * (\ 15{,}000 + 100{,}000\ ) - 70{,}000 * (\ 1 + (9/12)*(.07)\ ) \\
&= 123{,}050 - 73{,}675 \\
&= 49{,}375 \\
\text{Loss base} &= 90{,}000 - 49{,}375 = 40{,}625
\end{aligned}
$$

You need to determine the Limit Adjustments for the maximum deductible limit.

Limit adjustment for
Loss base = 5,406 = 40,625 ÷ $\ddot{a}_{\overline{10}|.07}$

IAL base = 150,300 (given)
Amortization = 19,999 = 150,300 ÷ $\ddot{a}_{\overline{10}|.07}$

You should note that an extremely large contribution was paid for 1994. You are told that all the contributions paid for 1993 were deducted for 1993, but they said nothing about the 1994 contribution. You need to calculate the deductible limit for 1994, and the amount of the non-deducted contribution:

1994 Deductible Limit:
Normal cost plus Limit adjustments at 7% interest = 1.07 (15,000 + 19,999) = 37,449

Non-deducted contribution for 1994 = 70,000 - 37,449 = 32,551.

1995 Deductible Limit:
Normal cost plus Limit adjustments at 7% interest = 1.07 (17,000 + 19,999 + 5,406) = 45,373

You may want to think about the §412 minimum, just in case it may increase the deductible limit for either 1994 or 1995. Since very large contributions have been paid, the plan has a large credit balance, and the minimum contribution is zero. The amount of cash contribution that can be paid during 1995 without creating a non-deductible contribution is 45,373 - 32,551 = 12,823.

Answer is D

Problem 29 **Revised 10/27/97**

This is an unusual 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, and normal form of annuity payment are all considered as changes in benefit amount that are 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 change in plan benefits at 01/01/93 is subject to phase-ins at the DOPT of 06/30/95. You should consider each cost of living adjustment as a single plan benefit. 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.

	Smith: 5 year phase-ins
Date of birth	07/01/31
07/01/95 age	64
Date of retirement	07/01/92
Years of service	30
Substantial owner?	NO
Vesting percentage	100%
01/01/85 Base plan benefit, original retirement benefit	25,920 = 30(2%)(54,000)[1-5%(4)], or 2,160 / mo.
Years plan has been in effect	10
Phase-in	2,160
01/01/93 Base plan benefit	2,224.80 = 2,160(1.03)
Guaranteeable benefit increase	64.80 = 2, 224.80 - 2,160.00
Years plan has been in effect	2
2 year phase-in	40.00 = Greater of 40% or $40/mo.
01/01/94 Base plan benefit	2,269.30 = 2,224.80(1.02)
Guaranteeable benefit increase	44.50 = 2,269.30 - 2,224.80
Years plan has been in effect	1
1 year phase-in	20.00 = Greater of 20% or $20/mo.
Total guaranteed monthly benefit	2,220.00 = 2,160.00 + 40.00 + 20.00

The final cost of living increase is effective for less than one year, and is not phased in at all. The PBGC maximum monthly guaranteed benefit adjusted for benefit commencement at age 64 is 2,393.69 = .93(2,573.86). Since this exceeds the benefits under both plans, it has no effect.

Answer is C

Problem 30 - Page 1 **Revised 07/06/00**

This is a difficult problem on maximum offset allowance (MOA) plans. The safe harbor rules under §401(l) require that the MOA be defined as the lesser of [0.75% (as adjusted under §1.401(l)-3(d) and §1.401(l)-3(e), if necessary), or .50 times the gross benefit percentage times a ratio]. The ratio (limited to 1.0) equals the average annual compensation divided by [final average compensation (FAC), limited to the offset level]. See below for definitions of these terms.

§1.401(l)-3(d) contains the requirements for the offset level. The offset level in the plan is the lesser of employee's covered compensation or FAC, which satisfies §1.401(l)-3(d)(3).

§1.401(l)-3(e) contains the adjustments for benefit commencement prior to the Social Security Retirement Age. Problem 19 shows the table of varying factors which represent the adjustment in the .75% below SSRA.

Since you were not given the complicated table with adjusted values of .75% based on §1.401(l) (for retirement at other than SSRA), you were probably supposed to assume you could ignore that part of the safe harbor definition. It did not have any impact in this problem. Both Smith and Brown have an SSRA of 65, so no adjustment is needed.

Additional definitions in the §401(l) regulation:

- The offset level is a limit on the amount of each employee's FAC taken into account to calculate the offset under the plan.

- Covered compensation is the average of earnings (limited to the taxable wage base) for the 35 year period that ends with the last day of the calendar year that the employee will attain SSRA.

- §1.401(a)(4)-3(e)(2) defines average annual compensation as an average of 414(s) compensation over at least three consecutive 12 month periods (but not longer than the employment period). In general, this should match the compensation definition used for the gross benefit.

- FAC is the average of 414(s) compensation (limited to the social security taxable wage base) over the three consecutive year period ending with or within the plan year (but not longer than the employment period).
-

In the given plan, the gross benefit percentage is 1.50%, and the offset percentage is .75%. The offset is defined based on FAC, and the offset level is covered compensation. For both participants, half of the gross benefit accrual (times the ratio) is less than or equal to the adjusted .75%.

Problem 30 - Page 2 **Revised 01/07/02**

The simplest way to view this type of problem is that the MOA can't exceed 50% of the gross benefit portion. I believe this is a bit of an oversimplification when compared to the definitions shown on the preceding page. This final result exactly matches my previous (much longer) method of solution:

	Smith	Brown
Date of birth	01/01/35	01/01/35
SSRA	65	65
01/01/97 age	60	60
Date of hire	01/01/89	01/01/89
Years of service	6	6
"Gross" benefit percent under plan	1.50%	1.50%
Past 5 years compensation	100,000	250,000
FAE (5 years)	20,000	50,000
"Gross" benefit under plan	20,000*(1.50%)*6.0 = 1,800	50,000*(1.50%)*6.0 = 4,500

Average annual compensation - 5 years (not used in simplified solution)	20,000	50,000

FAC (3 years)	25,000	55,000
1994 covered compensation	33,000	33,000
FAC < covered compensation	25,000	33,000

Offset benefit percent under plan	0.7500%	0.7500%
Preliminary offset benefit under plan: [FAC < CC] * offset % * service	25,000*(.7500%)*6.0 = 1,125	33,000*(.7500%)*6.0 = 1,485
Final offset, limited to half of gross	900	1,485

Final benefit, gross minus limited offset	900	3,015

The sum of the annual accrued benefits is 900 + 3,015 = 3,915

Answer is D

Problem 31

§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 deductible limit for a year was based on the unfunded current liability, the deduction limitation would be no less than that amount.

First you should calculate the deductible limit for 1995, which was paid to the DB plan on 12/31/95:

Normal cost plus limit adjustments	26,750 = 1.07*(10,000 + 15,000)
§404 ERISA full funding limitation	37,450 = 1.07*(10,000 + 100,000 - 75,000)
§404 OBRA full funding limitation	89,100 = 1.5(112,900) - 1.07(75,000)
Initial 1995 deductible limit	26,750 = Lesser of 26,750 and lesser of (37,450 and 89,100)
Unfunded current liability 12/31	32,650 = 112,900 - 1.07(75,000)
Final 1995 deductible limit	32,650 = Greater of 32,650 and 26,750

The deduction limitation is the greater of 25%(250,000) = 62,500, and the greater of [zero minimum contribution requirement for the DB plan, or the unfunded current liability of 32,650] = 62,500.

The total contribution paid for the DB plan is the deductible limit of 32,650. The remaining portion of the deduction limitation is 62,500 - 32,650 = 29,850. The profit sharing plan has a separate deduction limitation of 15% of compensation. The maximum amount that could be contributed to the profit sharing plan is the lesser of 29,850 and 37,500 (15% of 250,000), which gives 29,850 as the final answer.

Note that any employee pre-tax elective contributions would be counted as employer contributions in doing these calculations.

Answer is D

Problem 32 - Page 1 **Revised 09/10/97**

With an individual type cost method and market value of assets, you should check that the Full Funding Limitation (FFL) may apply. You should check to see if an experience gain occurred in 1994.

In order to calculate the experience G/L, you must derive the value of the accrued liability at 01/01/95. You can calculate the UAL as AL - AAV. The AL can be calculated as PVB - PVNC. The PVNC can be calculated based on the normal cost. Under the ILP cost method, each participant's new layer of normal cost is calculated using this formula:

$$\text{Change in ILP NC} = \frac{\Delta \text{ PVNC}_{IA}}{\ddot{a}_{IA:\overline{65-IA}|.07}}$$

With no pre-retirement decrements and no salary scale, the participant's normal cost should remain constant each year. CA is the participant's current age:

$$\text{01/01/95 ILP NC} = \frac{\text{PVNC}_{CA}}{\ddot{a}_{CA:\overline{65-IA}|.07}} = 36{,}443$$

Date of birth = 01/01/48
01/01/95 age = 47

$$\text{01/01/95 PVNC} = 36{,}443 * \ddot{a}_{\overline{18}|.07}$$
$$= 392{,}244$$

01/01/95 AL = PVB - PVNC
= 227,756 = 620,000 - 392,244

01/01/95 UAL = AL - AAV
= 17,256 = 227,756 - 210,500

Under the ILP method, the IAL is zero. In general, there will be no amortization bases under 404 or 412 unless experience gains and losses have occurred. The only source of limit adjustments under 404 is the G/L during 1994:

G/L = ${}_eUAL_1$ - UAL_1
${}_eUAL_1$ = O/S 412 bases - credit balance
= 0 - 0 = zero

Gain = zero - 17,256
Loss = 17,256

Problem 32 - Page 2 **Revised 06/18/02**

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.

Deductible limit = (1+i) * (NC + LA)
= (1.07) * [36,443 + 17,256 / $\ddot{a}_{\overline{10}|.07}$]
= (1.07) * [36,443 + 2,296] = 41,451

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

§404 "ERISA" FFL = (1+i)*(ILP NC + AL - (lesser MVA,AAV))
= 1.07 * (36,443 + 227,756 - 210,500)
= 57,458

The §404 FFL of 57,458 does not apply. Now you must check the §412 minimum contribution to see if it is greater. This is necessary because there is no credit balance, and there was an experience loss. Since the loss is amortized over 5 years (instead of 10), this could produce a larger deductible limit.

Loss amortization =17,256 / $\ddot{a}_{\overline{5}|.07}$
= 3,933

1995 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	36,443	Credit Balance	-0-
Loss Amort	3,933	12/31 contrib	x
7% interest	2,826	7% interest	-0-
Total charges	43,203	Total credits	x

The minimum contribution is 43,203. The §412 FFL will not apply, because the values will be identical to those calculated under §404. There would be no FFL credit unless the resulting FFL values were less than the AFD of 43,203.

The final deductible limit is the required §412 minimum contribution of 43,203. If you had more than 100 participants, and if the 12/31/94 Unfunded current liability (UCL) was greater than 43,203, then the final deductible limit would be the UCL.

Answer is E

Problem 33 - Page 1

Under the Modified Presumptive method, the calculation of withdrawal liability is relatively simple. You must determine the amount of the pre-09/29/80 UVB that is "presumed" to remain at 12/31/93 (end of plan year preceding withdrawal). The amount is "presumed" to decrease each year based on a fifteen year interest amortization.

The UVB at the end of the plan year preceding 09/29/80 is the 4,000,000 UVB at 12/31/79. At 12/31/93, the "presumed" remaining amount is

$$410{,}447 = 4{,}000{,}000 * \left(\ddot{a}_{\overline{1}|.07} \; / \; \ddot{a}_{\overline{15}|.07} \right)$$

and the new pool of UVB at 12/31/93 is 1,589,553 = 2,000,000 - 410,447.

Employer A's share of the 12/31/93 UVB pool of 1,589,553 is based on the ratio of employer A's contributions in the prior five years to the total contributions in the five years prior to 12/31/93:

YEAR:	1993	1992	1991	1990	1989

$$\text{ER share} = 1{,}589{,}553 * \frac{48{,}000 + 47{,}000 + 45{,}000 + 42{,}000 + 41{,}000}{1{,}300{,}000 + 1{,}250{,}000 + 1{,}200{,}000 + 1{,}150{,}000 + 1{,}100{,}000}$$

$$\text{ER share} = 1{,}589{,}553 * \frac{44{,}600 * 5}{1{,}200{,}000 * 5}$$

$$= 59{,}078$$

Employer A's share of the 12/31/93 remaining amount of the 12/31/79 UVB pool is based on the ratio of employer A's contributions in the prior five years to the total contributions in the five years prior to 12/31/79. Since the plan was established at 01/01/77, you only have three years of data:

YEAR:	1979	1978	1977

$$\text{ER share} = 410{,}447 * \frac{28{,}000 + 26{,}000 + 25{,}000}{600{,}000 + 550{,}000 + 500{,}000}$$

$$\text{ER share} = 410{,}447 * \frac{79{,}000}{1{,}650{,}000}$$

$$= 19{,}652$$

Problem 33 - Page 2

After determining Employer A'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 * 2,000,000 = 15,000). The deductible is the de minimis amount reduced by the excess (if any) of the allocated UVB over 100,000. The deductible is 15,000 less (78,730 - 100,000), or 15,000. The final employer withdrawal liability is 78,730 - 15,000 = 63,730.

Answer is C

Problem 34

I. FALSE

This is not a prohibited transaction. See ERISA §407(a)(2), which describes the 10% limit for investment in employer securities.

II. TRUE

See §4975(c)(1)(D) of the Internal Revenue Code

III. TRUE

See §4975(c)(1)(A) of the Internal Revenue Code

IV. TRUE

See §4975(c)(1)(C) of the Internal Revenue Code

All but I are true

Answer is A

Problem 35

At 01/01/95		**At 01/01/97**	
Age	60	Age	62
Service	7 years	Service	9 years
Participation	5 years	Participation	7 years

Based on the plan definition given, Smith's normal retirement age is 62. First, you should calculate the projected benefit under the plan.

Age 61 projected pay	=	115,500 = 1.05 * 110,000
Age 62 FAE3	=	110,833 = (115,500 + 110,000 + 107,000) / 3
Projected plan benefit (no limitations)	=	74,812 = 110,833 * 75% * (9/10)

The §415 limits have to be reduced for service (or participation) less than ten years. Under §415(b), the reduction on the dollar limit is based on years of participation.

Age 62 100% 3 year comp. §415 limit	=	110,833 * 9/10
	=	99,750
Social Security Retirement Age	=	65 since born in 1935
Age 62 §415 dollar limit	=	120,000 * 7/10 * .80
	=	67,200

Smith's benefit would be limited to the lesser of 74,812 or the lesser of 99,750 and 67,200, which equals 67,200.

Answer is A

Problem 36 - Page 1

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. You are given the net amortization charges at 01/01/94, which include amortization of any prior G/L. You will need to calculate the experience G/L for 1994.

1994 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	100,000	Credit Balance	-0-
Net amortization	30,000	12/31 contrib	120,000
7% interest	9,100	7% interest	-0-
Total charges	139,100	Total credits	120,000

At first glance, it looks like there is a deficiency at 12/31/94. The main point of this problem is that you must check to see if the FFL applied for 1994. In this problem, the FFL produces an OBRA Full Funding credit amortization base that will be amortized over 10 years in 1995.

"ERISA" FFL = (1+i)*(EAN AL + NC - (lesser MVA,AAV - CB))
= 1.07*(100,000+300,000-(280,000-0))
= 128,400

"OBRA" FFL = 1.50 (12/31 CL) - (1+i)*(lesser MVA,AAV - CB))
= 1.50*270,000 - 1.07*(280,000-0)
= 105,400

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 charges of 139,100. 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 = 139,100 - 128,400
= 10,700
"OBRA" Full Funding Credit = 139,100 - 105,400
= 33,700

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 = 33,700 - 10,700
= 23,000

Problem 36 - Page 2

1994 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	100,000	Credit Balance	-0-
Net amortization	30,000	12/31 FFL credit	33,700
		12/31 contrib	120,000
7% interest	9,100	7% interest	-0-
Total charges	139,100	Total credits	153,700

The final FFL credit is based on the lesser of the ERISA FFL, and the OBRA FFL. The resulting credit balance at 12/31/94 is 153,700 - 139,100 = 14,600.

The first step in setting up the 1995 MFSA is to calculate the amount of the 1994 G/L:

$$\begin{aligned} 01/95\ {}_eUAL_1 &= (1+i)*(\ NC_0 + UAL_0\ ) - (\ contrib + i\ ) \\ &= 1.07 * (\ 100{,}000 + 20{,}000\ ) - 120{,}000 \\ &= 120{,}000 * .07 \\ &= 8{,}400 \end{aligned}$$

$$\begin{aligned} 01/01/95\ UAL &= 450{,}000 - 420{,}000 = 30{,}000 \\ Loss\ base &= 30{,}000 - 8{,}400 = 21{,}600 \\ Amortization &= 4{,}923 = 21{,}600 \div \ddot{a}_{\overline{5}|.07} \end{aligned}$$

The OBRA FFC base will be amortized over 10 years starting in 1995:

$$3{,}060 = 23{,}000 \div \ddot{a}_{\overline{10}|.07}$$

1995 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	90,000	Credit Balance	14,600
FFC amortization	3,060		
Loss amortization	4,923	12/31 contrib	x
7% interest	6,859	7% interest	1,022
Total charges	104,843	Total credits	x + 15,622

At 12/31/95, the minimum contribution is 104,843 - 15,622 = 89,221. You also should check that the FFL does not apply for 1995. The ERISA FFL can be calculated as 144,022, which does not apply. The OBRA FFL of 121,222 does not apply either.

Answer is C

Problem 36 – Page 3 **Added 01/10/01**

Alternate solution

Several students suggested that I should have used 81-213 to calculate the G/L value. I really can't be 100% certain of this, since RR 81-213 preceded OBRA 87 by a few years. This particular situation could not have been anticipated by RR 81-213, since we have a new OBRA FFL base.

There are two different ways to work this problem, but they both produce identical results, which is not what I would expect in all cases. I believe that using RR 81-213 would require you to allow for the new OBRA base at 1-1-95:

01/01/95 UAL = O/S bases - CB – ARA
= Loss + OBRA – CB – 0
01/01/95 Loss = UAL – OBRA + CB
= 30,000 – 23,000 + 14,600
= 21,600

It appears that the values in this problem have been "plugged" to produce the same 21,600 Loss base that you get from the normal calculation of the G/L via the expected UAL, as shown in the solution on page 2. If you look carefully, you'll notice that the 1-1-94 UAL of 20,000 seems inconsistent with the 30,000 net amortization charges at 1-1-94. I believe this UAL value of 20,000 was chosen so that both methods of solution produce the same result.

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Problem 37 **Revised 01/08/03**

Here are the steps required to work this problem:
1. Calculate the non-highly compensated concentration percentage
2. Identify the safe harbor and unsafe harbor percentages from the table
3. Identify the employees included in the rate group for HCE 40
4. Calculate the ratio percentage for the rate group for HCE 40
5. Calculate the "minimum required ratio percentage" for the rate group

The non-highly compensated concentration percentage is defined under the regulations at §1.410(b)-4(c)(4)(iii) as the ratio of NHCEs to total non-excludable employees, which is 900 / 1,000 = 90%. The safe harbor percentage is 27.5%, and the unsafe harbor percentage is 20.0%.

The definition of a rate group is that it consists of all employees with both a normal accrual rate and a most valuable accrual rate that equal or exceed those rates for a given HCE. The rate group for HCE 40 has both a normal accrual rate ≥ 1.75% and a most valuable accrual rate ≥ 2.50%. This includes three groups:

- NHCEs 676-900 with normal accrual rate = 2.15% and a most valuable accrual rate = 2.70%
- HCEs 31-60 with normal accrual rate = 1.75% and a most valuable accrual rate = 2.50%
- HCEs 61-100 with normal accrual rate = 2.00% and a most valuable accrual rate = 2.65%

There are 225 NHCEs and 70 HCEs included in this rate group. The ratio percentage for the rate group is calculated as
[(225 / 900) / (70 / 100)] = .25 / .70 = 35.71%

Since the ratio percentage is less than 70%, the rate group must pass the average benefits percentage test of 1.410(b)-2(b)(3). This test has two parts, just like the ABP test in 410(b)(2)(A). The first part of the test is the non-discriminatory classification test. All rate groups are deemed to satisfy the reasonable classification requirement. In lieu of the facts-and-circumstances requirement, each rate group's ratio percentage must equal or exceed the lesser of

- The ratio percentage for the plan, or
- The midpoint between the safe and unsafe harbor percentages for the testing group

The best interpretation of the "minimum required ratio percentage" for the rate group is that it equals the value described above. The ratio percentage for the plan is difficult to calculate without the numbers of NHCEs and HCEs benefiting under the plan. If you assume that all non-excludable employees benefit under the plan, the total ratio percentage is 100%.

The "minimum required ratio percentage" is .5 * (20.0% + 27.5%) = 23.75%. The excess of the ratio percentage for the rate group over that value is 35.71% - 23.75% = 11.96%.

Answer is D

Problem 38

Since you have no Entry Age Normal valuation results, you can't check the Full Funding Limitation. With the change in the interest rate, you have to determine the outstanding amount of the IAL amortization base at 7%, and calculate the amortization at 8%. Since the base was established at 01/01/87, the remaining amortization period is 30 - (95 - 87) = 22.

$$\begin{aligned} 01/95\ {}_eUAL_1 &= \text{O/S §412 bases - CB - ARA} \\ &= 800{,}000 * (\ddot{a}_{\overline{22}|.07} / \ddot{a}_{\overline{30}|.07}) - 15{,}000 - 0 \\ &= 698{,}108 = 713{,}108 - 15{,}000 \\ \text{IAL Amort.} &= 64{,}729 = 713{,}108 \div \ddot{a}_{\overline{22}|.08} \end{aligned}$$

$$\begin{aligned} 01/01/95\ \text{UAL} &= 600{,}000 \\ \text{Assump. base} &= 98{,}108 = 698{,}108 - 600{,}000 \\ \text{Amortization} &= 13{,}538 = 98{,}108 \div \ddot{a}_{\overline{10}|.08} \end{aligned}$$

Since you are given the credit balance at 12/31/95, you must solve for the normal cost at 01/01/95. This is an unusual trick combined with a "cheap" trick!

1995 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	NC	Credit Balance	15,000
IAL amortization	64,729	Assump. amort.	13,538
		05/01 contrib	130,000
8% interest	5,178 + .08*NC	8% interest	9,216
Total charges	69,907 + 1.08*NC	Total credits	167,754

The 8% interest is calculated as .08*(28,538) + .08*(8/12)*(130,000). The final credit balance is

$$\begin{aligned} 48{,}000 &= 167{,}754 - (69{,}907 + 1.08*NC) \\ 48{,}000 &= 97{,}847 - 1.08*NC \\ NC &= (97{,}847 - 48{,}000) / 1.08 \\ &= 46{,}154 \end{aligned}$$

Answer is B

You could try calculating the MFSA items at 01/01/95, but it isn't much simpler. The calculation of the interest at 01/01/95 on the 130,000 contribution is particularly tricky. You should produce the same normal cost of 46,154 at 01/01/95.

Problem 39 - Page 1

§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 deductible limit for a year was based on the unfunded current liability, the deduction limitation would be no less than that amount.

The first step is calculation of the §412 minimum for 1995. Then you can determine overall deduction limitation. Then you can calculate the payments to both plans, as limited by the overall deduction limitation. Finally, you can calculate the credit balance at 12/31/95.

The 25% of compensation limitation is .25 * (2,000,000) = 500,000. If the §412 minimum for 1995 exceeds that amount, then the overall deduction limitation will equal the §412 minimum.

Since the plan was established at 01/01/91, four years have passed in the remaining amortization period for §412. Since the maximum deductible limit has been contributed at 12/31 each year, four years have passed in the remaining amortization period for §404 as well:

$$
\begin{aligned}
01/95\ {}_{e}UAL_1 &= \text{O/S §412 bases - CB - ARA} \\
&= \text{O/S §404 bases} \\
&= 500{,}000 * \left(\ddot{a}_{\overline{6}|.07} \Big/ \ddot{a}_{\overline{10}|.07} \right) \\
&= 339{,}324
\end{aligned}
$$

$$
\begin{aligned}
01/95\ CB &= \text{O/S §412 bases - } 01/95\ {}_{e}UAL_1 \text{ - ARA} \\
&= 500{,}000 * \left(\ddot{a}_{\overline{26}|.07} \Big/ \ddot{a}_{\overline{30}|.07} \right) - 339{,}324 - 0 \\
&= 137{,}174 = 476{,}498 - 339{,}324
\end{aligned}
$$

With a credit balance of 137,174, it should be clear that the final overall deduction limitation is 500,000.

You are told that the DC plan contribution of 10% is deductible for the year it is paid. The DC plan contribution for 1995 is .10 * 2,000,000 = 200,000. The remaining amount of the overall deduction limitation for the DB plan is 500,000 - 200,000 = 300,000. Note that any employee pre-tax elective contributions would be counted as employer contributions in doing these calculations.

Problem 39 - Page 2 **Revised 09/21/98**

Next you should calculate the deductible limit ignoring the overall deduction limitation for 1995. If this is less than 300,000, then that amount will be contributed for the DB plan at 12/31/95. Otherwise, the remaining deductible limit for the DB plan of 300,000 will be contributed at 12/31/95.

IAL limit adjustment $66{,}532 = 500{,}000 \div \ddot{a}_{\overline{10}|.07}$

Normal cost plus limit adjustments $311{,}939 = 1.07*(225{,}000 + 66{,}532)$

Without the market value of assets, you can't check the §404 full funding limitations. With no current liability values, the final DB plan deductible limit is 311,939. Only 300,000 can be deducted for 1995.

The final step is to set up the 1995 MFSA, and to reflect the 300,000 contribution at 12/31/95.

IAL Amortization $= 37{,}657 = 500{,}000 \div \ddot{a}_{\overline{30}|.07}$

1995 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	225,000	Credit Balance	137,174
IAL amortization	37,657	12/31 contrib	300,000
7% interest	18,386	7% interest	9,602
Total charges	281,043	Total credits	446,776

The credit balance at 12/31/95 is 446,776 - 281,043 = 165,733.

Answer is C

Problem 40 - Page 1 **Revised 06/18/02**

Based on the plan year starting 07/01/94, this problem should be answered based on the pre-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) 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. In this problem, you are told there are no unpredictable contingent events.

The UOLA equals the amortization of the remaining portion of the unfunded old liability (UOL) over a period that was 18 years at 7-1-89. You are given the UOLA as 10,303.

The UNLA is defined as the unfunded new liability times the applicable percentage, which is 30% - 25% (FCL% - 35%) under pre-GATT. In this problem, you must calculate this percentage.

FCL% = (AAV - CB) / CL
= (290,000 - 40,000) / 520,000 = 48.08%

APP% = .30 - .25 [.4808-.35]
= 26.73%

The unfunded new liability is the excess of the unfunded current liability over the remaining portion of the unfunded old liability plus any unpredictable contingent event liability. The unfunded current liability is defined as the excess of the current liability over the actuarial asset value, reduced by the credit balance.

UCL = 520,000 - (290,000 - 40,000)
= 270,000
UNL = 270,000 - 90,000 = 180,000
UNLA = 180,000 * 26.73% = 48,115
DRC = 10,303 + 48,115 = 58,418

You must subtract the §412 amortization charges for the IAL and plan amendments from the DRC to calculate the additional §412(l) charge. This §412(l) charge should be limited to the UCL of 270,000. Then you must bring the §412(l) charge forward to the end of the year with interest at the current liability rate:

06/30/95 §412(l) charge = 1.075 * (58,418 - [18,000 + 7,000])
= 35,925 = 1.075 * 33,418

With more than 150 plan participants, you don't pro-rate the additional §412(l) charge.

Problem 40 - Page 2

The final step is completing the MFSA for 1995. This is relatively easy, since you are given all the amortization values. One thing to beware of is that the §412(l) AFC should not get any interest, since you already adjusted it to the end of the plan year with the current liability interest rate.

1995 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	42,000	Credit Balance	40,000
IAL amortization	18,000	Assump. amort.	5,000
Amend. Amort.	7,000		
Loss amortization	30,000	06/30 contribution	x
7% interest	6,790		
06/30 §412(l)	35,925	7% interest	3,150
Total charges	139,715	Total credits	x + 48,150

At 06/30/95, the minimum contribution is 139,715 - 48,150 = 91,565. With no market value of assets, you can't check whether the FFL applies.

Answer is D

Problem 41 - Page 1 **Revised 07/06/00**

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.

At 01/01/96

Age	65	Birth date	01/01/31
Service	9 years	Hire date	01/01/87
Participation	9 years	Effective date	01/01/85

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 year 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").

In this problem, you are given the numerator and denominator of the DC fraction at 12/31/90. You must calculate the additional values from 1991 through 1995 for the DC fraction. Earnings under §415 is defined as the taxable compensation, which excludes the 401(k) deferrals. Earnings under §415 is not subject to the §401(a)(17) limit of 150,000.

	(1) Total Comp.	(2) 401(k) Deferrals	(3) Taxable Comp. (1) - (2)	(4) 35% Pay: 1.40*25% .25*(3)	(5) 1.25* 30,000	(6) Lesser of (4), (5)	(7) Annual Additions
1991	75,000	6,750	68,250	23,888	37,500	23,888	6,750
1992	80,000	7,200	72,800	25,480	37,500	25,480	7,200
1993	85,000	7,650	77,350	27,073	37,500	27,073	7,650
1994	100,000	9,000	91,000	31,850	37,500	31,850	9,000
1995	155,000	9,240	145,760	51,016	37,500	37,500	9,240
						145,791	39,840

The resulting DC fraction is [34,500 + 39,840] ÷ [80,500 + 145,791] = .3285. The maximum allowable DB fraction equals 1 - .3285 = .6715.

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 41 - Page 2 **Revised 09/21/98**

For calculating the plan retirement benefit, pension earnings is defined as gross compensation, which includes the 401(k) deferral. Pension earnings must not exceed the §401(a)(17) limit of 150,000:

Plan benefit at 01/01/96	=	.90 * (85,000 + 100,000 + 150,000) / 3
	=	100,500

The §415 DB plan limits have to be reduced for service (or participation) less than ten years. Under §415(b), the reduction on the dollar limit is based on years of participation.

Age 65 100% 3 year compensation	=	(77,350 + 91,000 + 145,760) / 3
	=	104,703
Age 65 100% 3 year comp. §415 limit	=	104,703 * (9/10)
	=	94,233
Social Security Retirement Age	=	65 since born in 1931
Age 65 §415 dollar limit	=	120,000 * (9/10)
	=	108,000

Ignoring the effects of §415(e), Smith's benefit of 100,500 would be limited to the lesser of 94,233 and 108,000, which equals 94,233.

Under §415(e), the reduction on the dollar limit in the denominator is based on years of service, not years of participation. In this problem, it makes no difference in the calculation.

$$\text{DB fraction} = 67.15\% = \frac{\text{Final projected benefit}}{[\text{ lesser of } 1.25(120{,}000)(.9) \text{ or } 1.40(104{,}703)(.9) \text{ }]}$$

Max. projected benefit	=	67.15% [1.40(104,703)(.9)]
	=	88,588

Since the resulting maximum benefit is less than the previously calculated maximum of 94,233, the final maximum benefit is 88,588.

Answer is B