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FALL 2000 EA-2
EXAM SOLUTIONS
(Course P-365U)

Solutions last revised July 14, 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, 2000.

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!

This exam had several “new” questions on material that had not been asked before. This is probably an indication of what the EA-2B exam will be like in May 2001.

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:

July 14, 2006	Corrected solution for problem 35
June 20, 2006	Clarified solution for problems 41 and 43
May 3, 2005	Corrected solution for problem 37
November 21, 2003	Corrected solution for problem 36
September 30, 2003	Corrected solution for problem 35
April 30, 2003	Corrected solution for problem 24
January 4, 2003	Corrected solutions for problems 25 and 45
December 18, 2002	Corrected solutions for problems 29, 30, 36, 46 and 48
June 21, 2002	Corrected solutions for problems 24, 27, 28, 29, 30 and 37
January 7, 2002	Corrected solutions for problems 37 and 47
July 9, 2001	Corrected solutions for problems 22, 37 and 50
April 23, 2001	Clarified solution for problem 22, corrected solution for problem 37
March 9, 2001	Original solutions

Problem 1

FALSE

This is almost a direct quote from the regulation. Employee benefit percentages should be determined based on plan years ending in the same calendar year.

See the regulation at 1.410(b)-5(d)(3).

Answer is B

Problem 2

TRUE

This seems to be covered in the Internal Revenue Code at 410(b)(6)(c).

Answer is A

Problem 3

Similar to 1997 #10

FALSE

RPA '94 added §412(c)(12) to the Internal Revenue Code, which states "In determining projected benefits, the funding method … shall anticipate benefit increases …" This requires that, for collectively bargained plans, the minimum funding requirement is determined based on the ultimate level of benefits. There is NO requirement that the current liability reflect any benefit increases that become effective beyond the end of the current plan year.

Answer is B

Problem 4

Similar to 1997 #16

FALSE

This is a tiny detail in §412(l)(7)(D)(iii)(I). In order to exclude of a percentage of pre-participation service, the employee must not have been covered under any other defined benefit plan maintained by any member of the controlled group. The employer could have had another DB plan, as long as the employee was not covered under it.

Answer is B

Problem 5

TRUE

This is one of the exclusions allowed in the definition of the valuation population. At 1.412(c)(3)-1(c)(3)(ii), it allows you to exclude plan participants who have not yet satisfied the age and service requirements of section 410.

Answer is A

Problem 6

FALSE

At 1.412(c)(3)-1(f), it allows for several methods of determining the cost of ancillary benefits. The general rule is that you should use the same method that was used for the cost of retirement benefits. Exceptions are granted for insurance contract plans (subsection (3)), the one year term cost method (subsection (4)), and section 401(h) benefits (subsection (5)).

Answer is B

Problem 7

Similar to 1997 #4

FALSE

Code section 401(a)(3) requires a qualified trust to satisfy the minimum participation standards of section 410(b). Code section 401(a)(26) contains additional participation requirements. In general, a trust is not qualified unless the plan, on each day of the plan year, benefits the lesser of 50 employees, or 40% or more of the employees of the employer.

SBJPA added the requirement, effective after 1996, that the plan cover at least 2 employees (or 1 employee if there is only 1 employee covered). This means that the new qualified plan must cover both Smith and Jones.

See 401(a)(26)(A)(ii)(II)

Answer is B

Problem 8

TRUE

This is a true statement.

See IRC section 4971(b)

Answer is A

Problem 9

TRUE

This is a true statement.

See the regulation at 1.410(b)-7(d)

Answer is A

Problem 10

TRUE

In general, after a merger, each plan must be at least as well funded as they were prior to the merger. If the assets cover 100% of the present value of accrued benefits, then a special schedule is not needed. Its only purpose is to handle the situation where, after a plan merger, one or more plans is less well funded than prior to the merger.

See the regulation at 1.414(l)-1(e)(1)

Answer is A

Problem 11

FALSE

This is almost true. In Q-12 of Revenue Ruling 95-31, it allows you to multiply the annuity purchases by the funded current liability percentage when calculating the adjusted disbursements. As a result, only part of the purchase of annuities may be excluded, not all of it.

Answer is B

Problem 12

TRUE

You are exempt from the PBGC notice requirement if you would be exempt from the 412(l) additional funding charge solely based on the funded current liability percentage (FCL%), regardless of the number of participants. You are exempt if (i) the FCL% is 90% or more, or (ii) it is 80% or more this year, and the FCL% is greater than or equal to 90% for two consecutive years of the prior three.

Note that there is a new exemption on the 2000 Form PBGC-1 that allows you to satisfy the DRC exemption based on either the 1999 or 2000 plan year.

See the PBGC regulations at 4011.3(b)(1), and the 2000 Form PBGC-1 instructions

Answer is A

Problem 13

FALSE

This is the first time this particular 415 limit has been tested on the EA-2 exam. In section 415(d)(1)(B), it allows you to apply cost of living adjustments to the 415(b)(1)(B) three year comp limit, but only if the participant is separated from service. Since this participant is still employed, the cost of living adjustment would exceed what is allowable under 415.

Answer is B

Problem 14

Similar to 1999 #15

TRUE

This question tests your knowledge of the rules in IRC section 318 regarding constructive ownership of stock. This code section was added to the syllabus for the 1999 exam.

Based on IRC 318(a)(1)(A)(ii), the daughter is considered as owning the stock owned by the father. Based on the definition of key employee at IRC 416(i)(1)(A)(iii), the child is considered a key employee due to ownership of 5% or more stock.

Answer is A

Problem 15

FALSE

This is a tiny detail in the regulations. Early retirement windows are considered for testing purposes only in the first plan year the window benefits are in effect. They are ignored in subsequent years.

See the regulation at 1.401(a)(4)-3(f)(4)(ii) and 1.401(a)(4)-4(d)(3)

Answer is B

Problem 16

TRUE

In general, if someone's benefit was limited under 415(e), then their benefit should be increased effective 01/01/2000, due to the repeal of 415(e). There are numerous examples of how this is done, depending on the exact plan provisions, in IRS Notice 99-44.

Answer is A

Problem 17

TRUE

When a pre-OBRA ’87 full funding credit applies to the minimum funding standard account, all prior bases are eliminated at the start of the following year. This destroys the actuarial equation of balance.

If you have an individual cost method, then there is a special rule that allows you to restore the balance equation. As described in Section 7.02 of Revenue Ruling 81-213, the new loss amortization base should not be calculated in the usual way. It should equal the sum of the unfunded actuarial liability and the credit balance.

Answer is A

Problem 18

FALSE

This is a tiny detail in the regulation. For defined benefit plans, the top heavy minimum benefit is defined on a life annuity basis. If the plan has a different normal form of benefit payment, at 1.416-1 Q&A M-3, it states that there are no specific assumptions mandated for the determination of the actuarial equivalent of the top heavy minimum.

Answer is B

Problem 19

FALSE

This is a tiny detail in the regulation. The PBGC is extremely powerful, and it can unilaterally force an involuntary termination in spite of any provisions to the contrary.

See the PBGC regulation at 4041.7(f)

Answer is B

Problem 20

FALSE

This is false, due to an obscure provision in the law.

See ERISA section 4225(b)

Answer is B

Problem 21

This problem is the only cash balance problem asked on the EA-2 exams so far. It actually has very little to do with the intricacies of cash balance plans.

There are two key points to the problem. One is the definition of the Top Heavy (T-H) vesting schedule (20% after two years, graded up to 100% after six years). The other is that the T-H minimum is defined in IRC 416 based on a life annuity payment form.

At 12/31/2000, the cash balance is 5,000, which is 10% of the 2000 pay of 50,000. The participant is 60% vested, based on four years of service at termination.

12/31/00 Data

Age 60
Service 4
T-H svc 1

The minimum accrual in a T-H plan is 2% of compensation for each year the plan is Top Heavy. Since the plan has only been T-H for one year, the T-H minimum accrued benefit is 2%(50,000) = 1,000 on a life annuity basis.

You should determine the present value of the T-H minimum on the actuarial equivalence basis specified in the plan. The participant's lump sum will be the greater of the value of the T-H minimum or the cash balance, multiplied by the vesting percentage.

$$\text{PV of T-H} = 1{,}000 * (D_{65} / D_{60}) \, \ddot{a}^{(12)}_{65}$$
$$= 1{,}000 * (1.0625)^{-5} * (10.443)$$
$$= 7{,}712$$

The lump sum will be based on the T-H minimum, which is greater than the cash balance of 5,000:

$$\text{Lump sum} = 7{,}712 * 60\%$$
$$= 4{,}627$$

Answer is D

Problem 22 – Page 1 **Revised 04/23/01**

This is the first problem ever asked on IRC Section 415 transition rules, as well as specifics of calculating 415 lump sums.

Q-12 of Revenue Ruling 98-1 allows you to apply different assumptions (IRC Section 415(b)(2)(E)) to the new law and old law benefits. In Q-13, the old law benefit is defined under the terms of the plan, based on the freeze date and the final implementation date.

Q-14 describes three different methods that may be used. In the problem, you are told the plan "elected the transition rule under Revenue Ruling 98-1 that provides the greatest lump sum." This means the plan elected Method 3, which is simply the greater of the results from Method 1 and Method 2. In addition, you should also assume that the plan amendment specifies the Section 415(b)(2)(E) changes will not apply to benefits accrued through the freeze date of 12/31/1999. Otherwise, the final benefits would be lower.

Method 1 requires you to split the benefit into two pieces. The old law benefit is calculated at the freeze date, applying Section 415 as of 12/31/99. When this old law benefit is converted to an equivalent lump sum, it will use the plan mortality and the greater of the plan rate or 5%. The remainder of the benefit (in excess of the old law benefit) will be converted using the post-GATT (or RPA '94) assumptions, which use the greater of the plan rate or the applicable interest rate (since the plan mortality basis is the same as the mandated mortality basis.)

Method 2 simply calculates the 415 limit at 12/31/00 using the post-GATT (or RPA '94) assumptions, then applies the old law benefit as a minimum. To do the lump sums, you need to calculate two benefits for the participant. The 12/31/99 date is used for the old law benefit, and the 12/31/00 date is used for the total benefit.

Birth date	1/1/36
Hire date	1/1/95
Effective date	1/1/93
Normal retirement age	65
Social Security retirement age	65

	As of 12/31/99	**As of 12/31/00**
Age	64	65
Service	5 years	6 years
Participation	5 years	6 years
Final average earnings	80,000	90,000
Accrued Benefit @ 65	5(12%)(80,000) = 48,000	6(12%)(90,000) = 64,800
Plan lump sum factor		11.534
Plan lump sum		747,403

Problem 22 – Page 2 **Revised 07/09/01**

The §415(b)(1)(B) compensation limit is reduced when service is less than ten years. The §415(b)(1)(A) dollar limit is reduced when participation is less than ten years. Both limits are reduced at both dates.

	As of 12/31/99	**As of 12/31/00**
415(b)(1)(A) Dollar limit	(130,000)(5/10)	(135,000)(6/10)
	= 65,000	= 81,000
415(b)(1)(B) Comp. limit	80,000(5/10)	90,000(6/10)
	= 40,000	= 54,000
415 limit, lesser of		
Dollar limit and Comp. limit	40,000	54,000
Benefit limited by 415	40,000	54,000

Now that the 415 limit has been determined at both the freeze date and the benefit commencement date, you can determine the lump sum using both Methods 1 and 2.

Method 1

As described earlier, the benefit must be split between the old law benefit, and the excess of the total plan benefit over the old law benefit. For the old law benefit, the pre-RPA rules under 415 apply. The lump sum is determined using the lump sum factor at the greater of the plan interest rate or 5%. This is the same as the plan basis (5% GAM-83.)

For the excess piece of the benefit, the RPA rules under 415 apply, as clarified under Revenue Ruling 98-1. The lump sum is determined using the lesser of two factors, one on the plan basis (5% GAM-83), and one on the mandated basis (6.25% GAM-83). Since the benefit form is subject to 417(e)(3), the mandated interest rate is the 30 year treasury rate.

Old law benefit, lump sum at 5% rate	(40,000)(11.534) =	461,360
Rest of benefit, lump sum at 6.25% rate	(14,000)(10.443) =	146,202
Total benefit and lump sum	54,000	607,562

Method 2

These calculations use the same total benefits and lump sum factors as Method 1:

Old law benefit, lump sum at 5% rate	(40,000)(11.534) =	461,360
Total benefit, lump sum at 6.25% rate	(54,000)(10.443) =	563,922
Greater of two lump sums		563,922

Method 3

The final result is greater of results from Methods 1 and 2, or 607,562.

Answer is B

Problem 23

The ratio percentage is defined under the regulations at §1.410(b)-9 as the percentage of non-highly compensated employees (NHCEs) who benefit under the plan divided by the percentage of highly compensated employees (HCEs) who benefit under the plan.

$$\text{Ratio \% test: } \frac{\left(\frac{\text{Non HCEs who benefit}}{\text{Total Non-excludable non HCEs}}\right)}{\left(\frac{\text{HCEs who benefit}}{\text{Total Non-excludable HCEs}}\right)}$$

The percentage of NHCEs who benefit under the plan equals the number of NHCEs in the plan divided by the total number of non-excludable NHCEs. The percentage of HCEs who benefit under the plan equals the number of HCEs in the plan divided by the total number of non-excludable HCEs.

The ratio denominators should be based on counts for the entire controlled group, not just for the single plan being tested. The excludable employees (defined in 1.410(b)-6), include those who do not meet the minimum participation requirements, nonresident aliens, collectively bargained employees, certain terminating employees, and other obscure groups.

The rules in 1.410(b)-6(f)(1) specify that a terminating employee may be excludable if they satisfy six criteria:

1. Employee does not benefit under the plan for the year
2. Employee is eligible to participate
3. The plan has a minimum period of service, or a requirement of being employed on the last day to receive an allocation
4. Employee fails to receive an allocation due to failure to satisfy item 3
5. Employee terminates with no more than 500 hours, and is not an employee on the last day of the plan year
6. If this paragraph is applied to any employee, it is applied to all employees for the year

Based on the previous definition, both NHCE 4 and NHCE 10 should be excludable employees. Of the four employees who terminated, these are the only two who worked less than 500 hours for the year (item 5 above). All of the other employees are non-excludable.

Of the three HCEs, all are both benefiting and non-excludable. Of the ten NHCEs, the five who worked over 1000 hours are benefiting. Two of the ten NHCEs are excludable and the remaining eight are non-excludable.

The ratio percentage is calculated as (5/8) divided by (3/3) = 62.5%

Answer is B

Problem 24 - Page 1 Similar to 1998 #30 **Revised 04/30/03**

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

At 01/01/00

Age	60	Birth date	1/1/40
Service	7 years	Hire date	1/1/93
Participation	7 years	Effective date	1/1/93
		Early retirement age	60
		Normal retirement age	65
		Social Security retirement age	66

Accrued benefit at age 60 = 150,000 * .10 * 7
= 105,000

Actuarial reduction from 65 to 60 = $(1.07)^{-5}$ * ($\ddot{a}^{(12)}_{65}$ / $\ddot{a}^{(12)}_{60}$)
= .7130 * (8.67 / 9.82) = .6295

Early retirement benefit at age 60 = 66,096 = 105,000 * .6295

The plan early retirement benefit of 66,095 is the actuarial equivalent of the accrued benefit on a life annuity form. You are told that Smith elected a Joint and 100% Survivor annuity form, so the optional form adjustment must be applied to the plan benefit:

100% J&S optional form adjustment = $\ddot{a}^{(12)}_{60}$ / $\ddot{a}^{(12)}_{60:60}$
= 9.82 / 11.50 = .8539

100% J&S benefit at age 60 = 56,441 = 66,096 * .8539

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

Age 60 100% 3 year comp. §415 limit = 105,000 = 150,000 * (7/10)

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 2000 = 135,000 at age 66 * (7/10)
§415 dollar limit at age 65 = 135,000 * .7 * .9333
§415 dollar limit at age 64 = 135,000 * .7 * .8667
§415 dollar limit at age 63 = 135,000 * .7 * .8000
§415 dollar limit at age 62 = 135,000 * .7 * .7500 = 70,875

Problem 24 - Page 2 **Revised 01/15/02**

§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. In this problem, you are given the actuarial equivalence basis as 7% GAM-1971.

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. This is consistent with the definition of the death benefit. With a 100% pre-retirement death benefit, there is no risk of forfeiting the benefit, and there is NO mortality risk involved. The actuarial reduction prior to age 62 is calculated using the ratio of the $ä_x$ values, which excludes the probability of death.

Actuarial reduction from 62 to 60	= $(1.05)^{-2}$ * ($ä^{(12)}_{62}$ / $ä^{(12)}_{60}$)	
(mandated 5% GAM-83 basis)	= $(1.05)^{-2}$ * (12.46 / 13.04)	= .8667
Actuarial reduction from 62 to 60	= $(1.07)^{-2}$ * ($ä^{(12)}_{62}$ / $ä^{(12)}_{60}$)	
(plan 7% GAM-71 basis)	= $(1.07)^{-2}$ * (9.37 / 9.82)	= .8334
§415 dollar limit at age 60	= 70,875 * lesser of [.8667 or .8334]	
	= 59,068	
Final §415 limit at age 60	= 59,068, lesser of 105,000 or 59,068	

Smith's plan benefit of 56,441 is lower, so the §415 limit does NOT apply in this problem.

Answer is A

Note that there is no optional form adjustment necessary for the §415 limit, unlike the plan benefit. This is based on the definition at §415(b)(2)(B), which excludes a qualified joint and survivor benefit from the adjustment for form of benefit payment.

Problem 25 **Revised 01/04/03**

There are several key points to this problem:

- Interpret the measurement period as all past participation service
- How to calculate the MVAR
- Calculation of average annual compensation

Based on the measurement period, the method to calculate accrual rates is the "Accrued to Date" method. You should calculate the accrued benefit at 12/31/2000. Then you must determine the most valuable form of payment at each benefit commencement age up to testing age (65). The Qualified J&S form is always the most valuable form of benefit payment (as defined in the 1.401(a)(4) regulation).

You calculate the most valuable accrual rate by dividing the greatest normalized accrued benefit by both testing service and average annual compensation. In this problem, NRA is 62. You only have to do calculations for current age 61 and NRA 62. Since Smith entered the plan at 1/1/99, the final average pay is based on only two years of participation:

12/31/00 Final average compensation = 65,000 = ½ (60,000 + 70,000)
12/31/00 Accrued benefit = 2,600 = (.02)(2)(65,000)

To normalize the benefit, you need to allow for payment at both ages 61 and 62 on all optional forms of payment. The normalized benefit reflects a life annuity payment form at testing age:

	Accrued			Early ret	100% J&S		Normalized
Age	Benefit	ERF	J&S	J&S benefit	Annuity	Interest	Benefit
	(1)	(2)	(3)	(4)=(1)(2)(3)	(5)	(6)	(4)(5)(6) / 8.65
61	2,600	0.93	1.00	2,418	10.81	$(1.08)^4$	4,111
62	2,600	1.00	1.00	2,600	10.66	$(1.08)^3$	4,036

The last key to working this problem is determining the average annual compensation correctly. At 1.401(a)(4)-3(e)(2), it says the average annual compensation is determined using the averaging period with the highest 414(s) compensation. In addition, the averaging period is defined as three or more consecutive 12 month periods, but no longer than the period of employment.

In this problem, the employee has three years of service, so the average annual compensation is based on all three years:

12/31/00 Average annual compensation = 60,000 = 1/3 (50,000 + 60,000 + 70,000)
MVAR = 3.43% = (greater of 4,111 or 4,036) / (2.0 * 60,000)

Answer is D

Problem 26 - Page 1

Similar to 1998 #35

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 1999 MFSA to derive the credit balance for the 2000 MFSA:

Amortization base	Original Base	Amortization
1-1-76 IAL base	950,000	66,597 = 950,000 / $\ddot{a}_{\overline{40}\vert .07}$

1999 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	400,000	Credit Balance	-0-
IAL amortization	66,597	01/01 contribution	50,000
7% interest	32,662	7% interest	3,500
Total charges	499,259	Total credits	53,500

At 12/31/99, the deficiency is 499,259 – 53,500 = 445,759. After the waiver of 300,000, the plan still has a debit balance of 145,759 at 01/01/00. This is typical for waiver problems on the exam.

At 01/01/00, the new waiver base is established. The amortization of the waiver is over five years at 150% of the Federal mid term rate:

Amortization base	Original Base	Amortization
1-1-00 Waiver base	300,000	70,759 = 300,000 / $\ddot{a}_{\overline{5}\vert .09}$

To avoid "interest confusion" in the MFSA, it is a good idea to use an end of year amortization for the waiver, which is 1.09(70,759) = 77,128. Then you should credit 7% interest on all the other MFSA charges.

Problem 26 - Page 2

2000 Minimum Funding Standard Account

	Charges		Credits	
	Debit balance	145,759	Credit Balance	-0-
	Normal Cost	420,000		
	IAL amortization	66,597		
	7% interest	44,265	12/31 contribution	x
12/31	Waiver amortization	77,128	7% interest	-0-
	Total charges	753,749	Total credits	X

The minimum contribution at 12/31/00 is 753,749.

Answer is B

Problem 27 - Page 1 Similar to 1998 #47 **Revised 06/21/02**

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 01/01/98 and 01/01/99 are subject to phase-ins at the DOPT of 12/31/00. 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.

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. The MGB should be adjusted based on the age at DOPT (beyond retirement) of 62.

In addition, it must be adjusted to allow for the payment form of 3 year certain and life. This is the payment form in effect at the later of age at DOPT and age at benefit commencement. The factor should have been given in this problem. Since it was not, credit was given for two different answers. You could use the 5 year certain and life factor, or interpolate the 3 year certain and life factor. The interpolated factor is based on the .005 per year reduction for three years: $1 - 3(.005) = .985$.

The age 62 adjusted MGB is $2,545.06 = [1 - 3(.07)] * 3,221.59$. After allowing for the 3 year certain and life payment form, the adjusted MGB is $2,506.88 = .985 * 2545.06$. 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 27 - Page 2

	Smith: 5 year phase-ins
Date of birth	01/01/39
01/01/01 age	62
Date of retirement	01/01/99
Vesting percentage	100% based on prior retirement
01/01/92 early retirement benefit	2,200.00
Full years plan has been in effect	9
Phase-in	2,200.00
01/01/98 early retirement benefit	2,250.00
Guaranteeable benefit increase	50.00 = 2,250.00 - 2,200.00
Full years plan has been in effect	3
3 year phase-in	50.00 = Greater of 60%(50.00) or $60/mo, but not greater than the GBI
01/01/99 early retirement benefit	2,550.00
Maximum Guaranteeable benefit	2,506.88
Guaranteeable benefit increase	256.88 = 2,506.88 - 2,250.00
Full years plan has been in effect	2
2 year phase-in	102.75 = Greater of 40%(256.88) or $40/mo
Total guaranteed monthly benefit	2,352.75 = 2,200.00 + 50.00 + 102.75

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 E

If you used the 5 year certain and life factor, the Maximum Guaranteeable benefit is 2481.43, the last phase-in amount would be 92.57, and the total guaranteed benefit would be 2342.57, which is answer D.

Notes re: Guaranteed benefit calculations

1. The MGB does <u>not</u> increase beyond the year of plan termination. See Example 13 in Appendix A of the PBGC study note.
2. You should use the <u>later</u> of age at DOPT and age at benefit commencement for purposes of adjusting the MGB for age. See Example 16 in Appendix A of the PBGC study note.
3. You should use the form of payment in effect at the <u>later</u> of age at DOPT and age at benefit commencement for purposes of adjusting the MGB for form of payment. See Example 18 in Appendix A of the PBGC study note.
4. For retirements after DOPT, all benefit service accruals ceased at DOPT.

Problem 28 **Revised 06/21/02**

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. One minor point is that you should ignore the Unit Credit values given in the problem.

The problem asks for the deductible limit for 2000, which you calculate as normal cost plus limit adjustments. Since you have an end of year valuation, the deductible limit is equal to the sum of the normal cost and the limit adjustments (both of which are given). The deductible limit equals 122,000 = 110,000 + 12,000.

The next step is to check the Full Funding Limitation under §404. A key point is that, in 1999 and 2000, the OBRA 87 FFL current liability is multiplied by 155%:

§404 "ERISA" FFL = (1+i)*(NC + AL - (lesser MVA,AAV))
130,000 = 80,000 + 900,000 - 850,000

§404 "OBRA 87" FFL = 1.55 (12/31 CL) - (1+i)*(lesser MVA,AAV)) (if no benefit payments)
622,500 = 1.55*950,000 - 850,000

§404 "RPA 94" FFL = .90 (12/31 CL) - (1+i)*(AAV) (if no benefit payments)
Ignore it – this is a floor, and neither 404 FFL applies

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. The §404 FFL does not apply, so the deductible limit is 122,000.

Since the §404 FFL does not apply, you should think about the §412 minimum contribution. You can’t calculate it without the credit balance. Since you can assume there is only an IAL amortization base, which is amortized over 30 years, the §412 minimum would be smaller than 122,000.

For the §404 deductible limit based on Unfunded Current Liability, the participant count is defined “for the year”, and it includes all employees of the employer covered by DB plans in the controlled group. Since the total number of such employees is less than 101, the plan sponsor is not eligible for the deductible limit based on the Unfunded Current Liability. The final deductible limit is the initial calculation of 122,000.

Answer is B

Problem 29 - Page 1 **Revised 06/21/02**

You are told that pre-participation service is excluded under 412(l)(7)(D). In general, unless the employer elects otherwise, you include pre-participation service at less than 100% if the employee was never covered under any other DB plan by a member of the same controlled group, and the employee became a participant after 12/31/87. Note that this exclusion is never done for the Full Funding Limitations based on current liability.

Under 412(l)(7)(D), you include pre-participation service at 20% times the number of years of participation service. Since all employees have four years of participation service at 01/01/2000, you should include 80% of the pre-1996 based current liability:

Adjusted current liability = 80%(1,000,000) + 100%(1,700,000 – 1,000,000)
= 1,500,000

The first step is calculation of the Gateway test, to see if the plan is subject to §412(l). The problem would be too easy if they were not subject to §412(l)!

Gateway % = AAV / (RPA CL at highest rate)
= 1,000,000 / 1,500,000 = 66.67%

In this problem, you are told nothing about unpredictable contingent events. You must assume there are none.

This problem gives you all the values needed to calculate the Deficit Reduction Contribution (DRC) and the §412(l) AFC. Based on the exam conditions, since you are told nothing about the Optional or Transition Rules, you can ignore both. If the plan had elected the Optional Rule, the amount of the §412(l) additional funding charge (AFC) should be the greater of the values calculated under the post-GATT and pre-GATT rules.

Post-GATT AFC

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.

The unfunded new liability (UNL) is the excess of the unfunded current liability (UCL) over the remaining portion of the unfunded old liability (UOL) 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. The definition also specifies that any debit balance should be treated as zero for this purpose.

Since this is a plan established after OBRA ’87, the unfunded old liability is zero. The entire unfunded current liability will be considered as unfunded new liability.

Problem 29 - Page 2 **Revised 12/18/02**

UCL = CL - (AAV - CB)
= 1,500,000 - (1,000,000 - 45,000)
= 545,000
UOL = 0
UNL = UCL - UOL - UCEL
= 545,000

The UNLA is defined as the unfunded new liability times the applicable percentage, which is 30% - 40% (FCL% - 60%) under RPA 94. In this problem, you must calculate this percentage. In calculating the FCL%, any debit balance is treated as a zero CB.

FCL% = (AAV - CB) / CL
= (1,000,000 - 45,000) / 1,500,000 = .6367 (rounded to nearest .01%)

APP% = .30 - .40 [.6367 - .60] = 28.53%
If the FCL% is less than 60%, then the APP% would be limited to 30%.

UNLA = 545,000 * .285320
= 155,499
DRC = UOLA + UNLA + CLNC
DRC = 0 + 155,499 + 200,000
= 355,499

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

01/01/00 §412(l) charge = 55,499 = 355,499 - (250,000 + 50,000)
12/31/00 §412(l) charge = 58,996 = 1.063 * 55,499

Based on Revenue Ruling 96-21, this end of year §412(l) charge should be limited to the end of year UCL. For the sake of speed in working problems, you can simply look at the UCL at the start of the year and see that it will not be anywhere near the magnitude of the §412(l) charge. In general, the end of year UCL should never be less than the AFC.

With more than 150 plan participants, you don't pro-rate the additional §412(l) charge. Now you need to set up the minimum funding standard account to determine the minimum contribution.

Problem 29 - Page 3 **Revised 12/18/02**

2000 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	250,000	Credit Balance	45,000
Net amortization	50,000		
7% interest	21,000	12/31 contribution	x
12/31 412(l) AFC	58,996	7% interest	3,150
Total charges	379,996	Total credits	x + 48,150

You should at least think about the 412 Full Funding Limitation. If it applied, you would have a Full Funding Credit, which would produce a smaller minimum contribution. Since the Accrued liability is very large, the FFL equals 1,011,150, and it does not apply.

The minimum contribution at 12/31/00 is 331,846 = 379,996 – 48,150.

Answer is D

Problem 30 - Page 1 Similar to 1997 #42 **Revised 06/21/02**

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

The first step is calculation of the Gateway test, to see if the plan is subject to §412(l). It would be TOO easy if the plan passed the Gateway test!

Gateway % = AAV / (RPA CL at highest rate) = 1,300,000 / 2,000,000 = 65%

Since the percentage is less than 80%, the plan is definitely subject to §412(l). In this problem, you are told nothing about unpredictable contingent events. You must assume there are none.

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.

The unfunded new liability (UNL) is the excess of the unfunded current liability (UCL) over the remaining portion of the unfunded old liability (UOL) 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 = OBRA CL - (AAV - CB)
= 2,000,000 - (1,300,000 - 100,000)
= 800,000
UOL = 400,000 (given)
UNL = UCL - UOL - UCEL
= 800,000 - 400,000 - 0 = 400,000

The UOLA equals the amortization of the remaining portion of the unfunded old liability (UOL) over a period that was 18 years at 1-1-89, at the 6.0 % current liability rate:

01/01/00 UOL	Remaining years	UOLA
400,000	7 = 18 - (100-89)	67,598

Problem 30 - Page 2 **Revised 12/18/02**

The UNLA is defined as the unfunded new liability times the applicable percentage, which is 30% - 25% (FCL% - 35%) under OBRA 87. In this problem, you must calculate this percentage.

FCL% = (AAV - CB) / CL
= (1,300,000 - 100,000) / 2,000,000 = 60.0% (rounded to nearest .01%)

APP% = .30 - .25 [.60-.35]
= 23.75%

UNLA = 400,000 * .23750 = 95,000
DRC = UOLA + UNLA
= 67,598 + 95,000 = 162,598

You must subtract the §412 amortization charges for the IAL and plan amendment from the DRC to calculate the additional §412(l) charge. This §412(l) charge should be limited to the UCL of 800,000. Then you must bring the §412(l) charge forward to the end of the year with interest at the current liability rate:

01/01/00 §412(l) charge = 162,598 - 95,000 = 67,598
12/31/00 §412(l) charge = 1.0600 * 67,598 = 71,654

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.

The unfunded new liability (UNL) is the excess of the unfunded current liability (UCL) over the remaining portion of the unfunded old liability (UOL) 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 = RPA CL - (AAV - CB)
= 2,000,000 - (1,200,000 - 100,000)
= 800,000
UOL = 500,000 (given)
UNL = UCL - UOL - UCEL
= 800,000 - 500,000 - 0 = 300,000

Problem 30 - Page 3 **Revised 12/18/02**

The UOLA equals the amortization of the remaining portion of the unfunded old liability (UOL) over a period that was 18 years at 1-1-89, at the 6.00% rate:

01/01/00 UOL	Remaining years	UOLA
500,000	7 = 18 - (100-89)	84,498

The UNLA is defined as the unfunded new liability times the applicable percentage, which is 30% - 40% (FCL% - 60%) under RPA 94. In this problem, you must calculate this percentage.

FCL% = (AAV - CB) / CL
= (1,300,000 - 100,000) / 2,000,000 = 60.0% (rounded to nearest .01%)

APP% = .30 - .40 [.60 - .60]
Since the FCL% is less or equal to 60%, the APP% is limited to 30%.

UNLA = 300,000 * .30000 = 90,000
DRC = UOLA + UNLA + CLNC
DRC = 84,498 + 90,000 + 80,000 = 254,498

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

01/01/00 §412(l) charge = 254,498 - (90,000 + 125,000) = 39,498
12/31/00 §412(l) charge = 1.0600 * 39,498 = 41,868

Based on Revenue Ruling 96-21, this end of year §412(l) charge should be limited to the end of year UCL. For the sake of speed in working problems, you can simply look at the UCL at the start of the year and see that it is not near the magnitude of the §412(l) charge.

The final 12/31/00 §412(l) charge is the greater of the OBRA 87 and the RPA 94 definitions, or 71,654.

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. The highest number during 1999 is 130.

12/31/00 §412(l) AFC= 71,654 * [2% * (130-100)]
= 71,654 * .60 = 42,992

Answer is D

Problem 31 - Page 1

Similar to 1999 #26

§411(c)(2) of the IRC defines the calculation of the employee provided accrued benefit. After the passage of OBRA '89, the §417(e) interest 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. 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).

You need to determine the age, service, vesting percentage and total accrued benefit at 01/01/2000:

	01/01/00
Age	55
Service	4
Vesting %	40%
FAE – 4 years	35,000 = 140,000 / 4
Accrued benefit	5,600 = 35,000 * 4 * 4.0%

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	EECWI calculation
1996	-0-	400	N/A	400	
1997	400	600	8.0%	1,032	= 1.08 * 400 + 600
1998	1,032	800	7.0%	1,904	= 1.07 * 1,032 + 800
1999	1,904	1,000	6.0%	3,018	= 1.06 * 1,904 + 1,000

Smith is age 55 at 01/01/00, and you have to convert the contribution balance to a benefit at normal retirement age, which is 10 years later. The 01/01/00 EECWI is accumulated with interest at the §417(e) rate until normal retirement age 65:

EECWI at 65 = $3{,}018 * (1.0625)^{10}$
= 5,535

Problem 31 - Page 2

The employee provided annual accrued benefit at age 65 is calculated by dividing the age 65 EECWI by the annuity value at the §417(e) interest rate of 6.25%:

5,535 ÷ 10.44 = 530

The final accrued benefit at 01/01/00 is 5,600. The accrued benefit is the greater of the employee provided benefit and the plan formula accrued benefit, which is still 5,600.

The question asks for the vested annual accrued benefit at 01/01/2000. The employee provided portion is always 100% vested, and the remaining accrued benefit is subject to the plan's vesting schedule:

100% (530) + 40% (5,600 - 530) = 2,558

Answer is D

Problem 32

This question tests your knowledge of the relationships between the different rules that are based on the Funded Current Liability percentage. The Gateway percentage is calculated in a similar fashion to the one used for the quarterly contribution exemption:
Gateway % = AAV / (RPA CL at highest rate in range)
RR 95-31 FCL % = AAV / (RPA CL) for prior year

General condition 39 allows you to assume that "Unless separate current liabilities are provided, the current liability is the same for all purposes."

I. TRUE
Since the 2000 gateway liability percentage is between 80% and 90%, you would not be subject to the §412(l) additional funding charge if the funded current liability percentage is greater than or equal to 90% for two consecutive years of the prior three (1997, 1998, and 1999). The only other way to avoid the §412(l) additional funding charge is if there were 100 or fewer participants. See §412(l)(9)(B)

II. FALSE
You are exempt from the PBGC notice requirement if you would be exempt from the 412(l) additional funding charge solely based on the funded current liability percentage (FCL%), regardless of the number of participants. You are exempt if (i) the FCL% is 90% or more, or (ii) it is 80% or more this year, and the FCL% is greater than or equal to 90% for two consecutive years of the prior three.

This is false due to the new exemption on the 2000 Form PBGC-1 that allows you to satisfy the DRC exemption based on either the 1999 or 2000 plan year. This is from the 2000 Form PBGC-1 instructions: "EXEMPTIONS: A plan that meets the Deficit Reduction Contribution (DRC) Exception Test for the 1999 or 2000 plan year is exempt from having to provide the 2000 Participant Notice."

III. TRUE
Single employer DB plans with a funded current liability percentage (FCL%) for the prior year less than 100% are subject to the quarterly contribution requirement of §412(m). Since the 1999 Gateway percentage is greater than 100%, they should be exempt. See Q.1 of Revenue Ruling 95-31.

I and III are true

Answer is E

Problem 33 – Page 1

Similar to 1999 #35

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 = [600,000 + 20,000 - 45,000] / $\ddot{a}_{\overline{10}|.07}$

= 76,511

Deductible limit = 121,992 = 1.07 * (37,500 + 76,511)

The second step is usually to check the Full Funding Limitation under §404. In this problem, you have no asset values, so you can not check the Full Funding Limitation. You have no information regarding the deductible limit based on Unfunded current liability.

The last step is to complete the 2000 Minimum Funding Standard Account, assuming payment at 01/01/00 of the deductible limit. One of the points of this problem is that the original amortization period for all OBRA bases was changed to 20 years, effective 01/01/99.

1997 OBRA FFC O/S base	=	30,000 ($\ddot{a}_{\overline{8}|.07}$ / $\ddot{a}_{\overline{10}|.07}$)	= 25,505
IAL amortization	=	600,000 / $\ddot{a}_{\overline{30}|.07}$ =	45,189
Loss amortization	=	expired 01/01/99 =	0
1997 OBRA FFC amortization	=	25,505 / $\ddot{a}_{\overline{18}|.07}$ =	2,370
Assumption amortization	=	45,000 / $\ddot{a}_{\overline{10}|.07}$ =	5,988
1999 OBRA FFC amortization	=	25,000 / $\ddot{a}_{\overline{20}|.07}$ =	2,205

Problem 33 – Page 2

2000 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	37,500	Credit Balance	10,000
IAL amortization	45,189	Assump amortization	5,988
1997 FFC amortization	2,370	01/01 contrib	121,992
1999 FFC amortization	2,205		
7% interest	6,108	7% interest	9,659
Total charges	93,372	Total credits	147,638

The credit balance is 147,638 – 93,372 = 54,266.

Answer is D

Problem 34 - Page 1

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 normal cost under EAN, you can't calculate the Full Funding Limitation.

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)

The plan amendment creates a new amortization base at 01/01/00. The increase in EAN accrued liability from 1,000,000 to 1,150,000 means that the UAL increased by 150,000.

Now calculate the normal cost under the Frozen Initial Liability method:

PVNC = PVFB - AAV - O/S bases + CB + ARA

Amortization base	Original Base	Original Years	Amortization	Remaining years	Outstanding base
01/90 IAL base	800,000	30	60,252	20 = 30 - (100-90)	682,987

PVNC = 2,500,000 - 950,000 – (682,987 + 150,000) + 0 + 0
= 717,013

PVE/E = 2,000,000 / 200,000 = 10.0000
NC = 717,013 / 10.00
= 71,701

Amortization base	Original Base	Original Years	Amortization
01/00 Plan change	150,000	30	11,297

Problem 34 - Page 2

2000 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	71,701	Credit Balance	-0-
IAL amortization	60,252		
Plan chg amortization	11,297	12/31 contribution	x
7% interest	10,028	7% interest	0
Total charges	153,278	Total credits	x

The minimum contribution at 12/31/00 is 153,278.

Answer is C

Problem 35 - Page 1

Similar to 1999 #32

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(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.

Amortization base	Original Base	Original Years	Amortization	Remaining years	Outstanding base
01/90 IAL base	450,000	30	33,891	20 = 30 - (100-90)	384,180

U.C. UAL = O/S bases + Method - CB - ARA
600,000 = 384,180 + Method - 25,000 - 0
Method = 600,000 - 384,180 + 25,000
= 240,820

The amortization period for all cost method change amortization bases specified in Revenue Procedure 95-51 is 10 years.

Amortization base	Original Base	Amortization
1-1-00 Method base	240,820	32,044 = 240,820 / $\ddot{a}_{\overline{10}\vert .07}$

Problem 35 - Page 2 **Revised 07/14/06**

2000 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	40,000	Credit Balance	25,000
IAL amortization	33,891		
Method amortization	32,044	12/31 contribution	x
7% interest	7,415	7% interest	1,750
Total charges	113,350	Total credits	x + 26,750

You should at least think about the 412 Full Funding Limitation. Since the UAL is 600,000, it should be clear that the Full Funding Limitation will not apply.

The minimum contribution at 12/31/00 is 113,350 – 26,750 = 86,600.

Answer is E

Problem 36 - Page 1 Similar to 1999 #39 **Revised 11/21/03**

§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 taxable 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 based on 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. You have no information to calculate the Full Funding Limitation. The deductible limit will be the greater of the normal cost plus limit adjustments, or the minimum under §412, which is 535,000.

Since the participant count is greater than 100, the deductible limit may be based on the Unfunded Current Liability of 650,000. The DB contribution was 750,000, and the final deductible limit is 650,000.

DC PLAN

The profit sharing plan has a separate deduction limitation of 15% of taxable compensation. The taxable compensation equals 2,500,000. This is calculated as the total compensation of 2,550,000 minus the 401(k) pre-tax deferrals of 50,000. The maximum amount that could be contributed to the profit sharing plan is 15% of 2,500,000, which gives 375,000.

Of the total contributions to the DC plan, the employer contributions (15,000 + 25,000) plus the employee pre-tax deferrals of 50,000 are considered as employer contributions, for a total of 90,000.

Problem 36 - Page 2 **Revised 12/18/02**

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 deduction based on unfunded current liability.

Based on the previous calculations, the DB plan minimum is less than the DB plan deductible limit of 650,000. 25% of taxable compensation equals 625,000. The overall deduction limitation is the greater of the two values, or 650,000.

The sum of the actual contributions for the two plans is 750,000 + 90,000 = 840,000. Since this exceeds the overall deduction limitation, the total non-deductible contribution for 2000 equals 840,000 – 650,000 = 190,000.

Answer is C

If this problem had asked for the excise tax, it is NOT based solely on the non-deductible contribution. Under RPA '94, there is an exemption from the excise tax for the lesser of (i) the DC plan contribution, or (ii) the greater of 6% of taxable compensation, or the sum of the employer matching contributions under §401(m)(4) plus the employee elective pre-tax deferrals under §402(g)(3). This excise tax exemption is only available if there are more than 100 employees covered by the DB plans whose contributions are limited.

Problem 37 - Page 1 **Revised 05/03/05**

This problem tests your knowledge of the method for adjusting assets and discounting contributions under both the General and the Alternative methods for calculating the Variable Rate Premium (VRP) on the PBGC-1 Form, Schedule A. Since the problem does not specify a method, but instead asks for the minimum VRP, you need to do calculations under both methods.

General Method

The calculations under the General method are slightly simpler, since you use values at 01/01/00. For the General method, you normally value the Vested Current Liability at the Required interest rate (RIR). This value is 700,000.

Use the asset value at 01/01/00, and reduce it by any included receivable contributions. Then you must add the discounted value of "contributions paid for plan years prior to the premium payment year …" The interest rate used for discounting assets under the general method is described as the "plan asset valuation rate" in the Schedule A instructions:

Adjusted assets $= (600{,}000 - 9{,}000) + 9{,}000*(1.0700)^{(-2.5/12)}$
$= 599{,}874$

Unfunded vested current liability $= 700{,}000 - 599{,}874$
$= 100{,}126$

The adjusted unfunded benefits liability must be rounded up to the next multiple of 1,000. The last step is to multiply the adjusted value of the unfunded benefits liability by .009:

Variable rate premium $= 101{,}000 * .009$
$= 909$

Alternative Calculation Method (ACM)

Since this is the 2000 PBGC premium calculation under the ACM, the determination date is 01/01/99. Use the Vested Current Liability at the plan interest rate, which equals 500,000. You are given the single factor of 1.261 to adjust the liability, which is much simpler than the complex procedure described in the Schedule A instructions:

01/01/99 Vested current liability 630,500 = 1.261 * 500,000

Problem 37 – Page 2 **Revised 05/03/05**

Use the asset value at 01/01/99, and reduce it by any included receivable contributions. Then you must add the discounted value of "contributions paid for plan years prior to the premium payment year …" The interest rate used for discounting assets is always the Required Interest Rate:

01/01/99 Adjusted assets = $(550{,}000 - 45{,}000) + 15{,}000*(1.0525)^{(-.5/12)} + 30{,}000*(1.0525)^{(-8.5/12)} + 9{,}000*(1.0525)^{(-14.5/12)}$
= 557,361

01/99 Unfunded vested liability = 630,500 – 557,361
= 73,139

The adjusted value of the unfunded benefits liability is the excess of the liabilities over the adjusted assets, "adjusted for the passage of time from the first day of the plan year preceding the premium payment year to the premium snapshot date." The interest rate used for the adjustment is the Required Interest Rate:

01/00 Unfunded vested liability = 73,139 * 1.0525
= 76,979

The adjusted unfunded benefits liability must be rounded up to the next multiple of 1,000. The last step is to multiply the adjusted value of the unfunded benefits liability by .009:

Variable rate premium = 77,000 * .009
= 693

The final variable rate premium is the lesser of the two values, which is 693.

Answer is B

NOTES:

1. The Alternative Calculation Method (ACM) normally uses current liability values from the prior year's Schedule B. The adjusted liability values allow for the difference between the current liability interest rate and the required interest rate.

2. You may value current liabilities at the required interest rate under the ACM, but only if the required interest rate exceeds the current liability interest rate. Then the only adjustment made to the current liabilities is the 1.07 factor for those not yet in pay status.

3. You may value current liabilities at the current liability interest rate under the General rule, but only if the required interest rate exceeds the current liability interest rate. You normally would <u>not</u> do this, since it results in a higher variable rate premium.

Problem 38

Similar to 1999 #28

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 2000, which you calculate as normal cost plus limit adjustments. Under the Aggregate method, there are no 404 bases. The deductible limit is equal to the normal cost increased with interest:

Deductible limit = 114,500 = 1.09 * 105,000

The next step is to check the Full Funding Limitation under §404. A key point is that, in 1999 and 2000, the OBRA 87 FFL current liability is multiplied by 155%.

§404 "ERISA" FFL = (1+i)*(NC + AL - (lesser MVA,AAV))
92,650 = 1.09 * (40,000 + 820,000 – 775,000)

§404 "OBRA 87" FFL = 1.55 (12/31 CL) - (1+i)*(lesser MVA,AAV)) (if no benefit payments)
638,135 = 1.55 * 1.063 * 900,000 - 1.09 * 775,000

§404 "RPA 94" FFL = .90 (12/31 RPA CL) - (1+i)*(AAV) (if no benefit payments)
27,298 = .90 * 1.063 * 940,000 - 1.09 * 800,000

Note that the end of year asset value (if any) should be used in calculating the OBRA 87 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 92,650. Since the §404 FFL applies, you don’t need to calculate the §412 minimum contribution.

For the §404 deductible limit based on Unfunded Current Liability, the participant count is defined “for the year”, and it includes all employees of the employer covered by DB plans in the controlled group. Since the total number of such employees (80 + 60) is more than 100, the plan sponsor is eligible for the deductible limit based on the Unfunded Current Liability:

§404 "RPA 94" UCL = 1.00 (12/31 RPA CL) - (1+i)*(AAV) (if no benefit payments)
127,220 = 1.063 * 940,000 - 1.09 * 800,000

The final deductible limit is the greater of the prior calculation of 92,650, and the unfunded current liability of 127,220.

Answer is D

Problem 39 - Page 1 **Revised 12/18/02**

This problem is the only includible employer contribution problem asked on the EA-2 exams so far. 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.

This problem is unique in that you are given two sets of valuation results, so you could actually guess wrong. Another unusual aspect is that the tax deduction is based on the valuation for the plan year ending in the tax year. This is not typical for exam problems, since the normal cost plus limit adjustments will receive a full year of interest.

The deductible limit for the taxable year ending 12/31/00 is based on the valuation for the plan year ending in that tax year. The 10/01/99 valuation should be used to determine the deductible limit needed for the answer to this problem.

At the beginning of the solutions for this year's exam is a list of steps to follow for problems involving the deductible limit. Here is step 3:

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."

The regulation at §1.404(a)-14(e)(1)(ii) states that "includible employer contributions" are contributions required under 412 that were not deducted under 404 due to a problem in contribution timing. The problem states that the balance of the 1999 minimum contribution beyond 50,000 was not deducted, and is an "includible employer contribution."

1999 Minimum contribution

The calculation of the normal cost under the Aggregate method must satisfy this formula:

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

PVNC = 850,000 – 200,000 – (0 – 0)
= 650,000

PVE/E = 1,100,000 / 100,000 = 11.0000
NC = 650,000 / 11.00
= 59,091

Problem 39 – Page 2

1999 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	59,091	Credit Balance	0
		12/31 contribution	x
7% interest	4,136	7% interest	0
Total charges	63,227	Total credits	x

The 09/30/99 minimum contribution is 63,227. The 50,000 contribution at 03/15/00 was deducted for the tax year ending 12/31/99. The remaining contribution to avoid a deficiency is 13,227. This amount was paid after 03/15/00, and could not be deducted for the 1999 tax year. The additional 13,227 is an "includible employer contribution" for the 2000 tax year.

2000 Minimum contribution

The calculation of the normal cost under the Aggregate method must satisfy this formula:

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

PVNC = 950,000 – 280,000 – (0 – 0)
= 670,000

PVE/E = 1,000,000 / 90,000 = 11.1111
NC = 670,000 / 11.1111
= 60,300

Since the minimum contribution was paid for the prior plan year, the credit balance at 10/01/99 is zero. The minimum contribution payable at 09/30/00 is simply the normal cost plus interest:

64,521 = 1.07(60,300)

2000 Deductible limit

The first step should be to calculate the normal cost plus limit adjustments. There are no ten year amortization bases or limit adjustments under the Aggregate method. 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 09/30/00.

Problem 39 - Page 3 **Revised 12/18/02**

The calculation of the normal cost under the Aggregate method must satisfy this formula:

PV Future Normal costs = PV Future Benefits – §404 Actuarial Assets

Since the contribution of 13,227 for the prior plan year has not yet been deducted, you must adjust the assets when calculating the §404 normal cost. The general relationship between the asset values is that the §404 AAV equals the §412 AAV minus any non-deducted contributions:

AAV = §412 AAV – NDC
= 280,000 – 13,227
= 266,773

PVNC = 950,000 – 266,773
= 683,227

PVE/E = 1,000,000 / 90,000 = 11.1111
NC = 683,227 / 11.1111
= 61,490

Deductible limit = 65,795 = 61,490 * 1.07

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.

The third step is to determine the §412 minimum contribution. This was calculated earlier as 64,521. The new wrinkle in this problem is that you are allowed to add any "includible employer contributions" to the §412 minimum, and then to compare it to the deductible limit:

Adjusted §412 minimum = 64,521 + 13,227 = 77,748

The deductible limit is 77,748, which is the greater of 65,795 and 77,748. Since you have no information on current liability, you can not check the §404 unfunded current liability.

Answer is D

Problem 40 - Page 1

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. More than 100 participants, can also use Unfunded Current Liability as alternate deductible limit
4. Overall DB/DC deduction limit applies to combination of DB and DC plan

§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 based on 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, which you calculate as normal cost plus limit adjustments. The Initial Accrued Liability is the only ten year amortization base.

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

O/S Bases = UAL + CB + ARA
= 7,800,000 – 7,500,000 + 0 + 0
= 300,000
= IAL * ($\ddot{a}_{\overline{20}|.07}$ / $\ddot{a}_{\overline{30}|.07}$)

300,000 = IAL * (11.3356 / 13.2777)
IAL = 351,398

Limit adjustment = 351,398 / $\ddot{a}_{\overline{10}|.07}$ = 46,758

Deductible limit = 800,000 + 46,758 = 846,758

Problem 40 - Page 2

The next step is to check the Full Funding Limitation under §404. A key point is that, in 1999 and 2000, the OBRA 87 FFL current liability is multiplied by 155%.

§404 "ERISA" FFL = (1+i)*(NC + AL - (lesser MVA,AAV))
1,100,000 = 800,000 + 7,800,000 – 7,500,000

§404 "OBRA 87" FFL = 1.55 (12/31 CL) - (1+i)*(lesser MVA,AAV)) (if no benefit payments)
7,225,000 = 1.55 * 9,500,000 - 7,500,000

§404 "RPA 94" FFL = .90 (12/31 RPA CL) - (1+i)*(AAV) (if no benefit payments)
Ignore it – this is a floor, and neither 404 FFL applies

Note that the end of year asset value (if any) should be used in calculating the OBRA 87 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. The §404 FFL does not apply, so the deductible limit is 846,758.

Since the §404 FFL does not apply, you should think about the §412 minimum contribution. Since you can assume there is only an IAL amortization base, which is amortized over 30 years, the §412 minimum would be smaller than 846,758.

For the §404 deductible limit based on Unfunded Current Liability, the participant count is defined “for the year”, and it includes all employees of the employer covered by DB plans in the controlled group. Since the total number of such employees is more than 100, the plan sponsor is eligible for the deductible limit based on the Unfunded Current Liability:

§404 "RPA 94" UCL = 1.00 (12/31 RPA CL) - (1+i)*(AAV) (if no benefit payments)
2,000,000 = 9,500,000 – 7,500,000

The final deductible limit is the greater of the prior calculation of 846,758, and the unfunded current liability of 2,000,000.

Problem 40 - Page 3

Under §404(g), 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 = 8,700,000 – 7,500,000
= 1,200,000

Since this amount is lower than the previously calculated deductible limit of 2,000,000, the 404(g) limit has no effect in this problem.

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 deduction based on unfunded current liability.

The DB contribution of 1,650,000 is less than the DB plan deductible limit of 2,000,000, so the DB plan deduction of 1,650,000 is based on the unfunded current liability. 25% of taxable compensation equals 1,500,000 = .25 * 6,000,000. The overall DB/DC plan deduction limit is the greater of the two values, or 1,650,000.

The sum of the actual contributions for the two plans is 1,650,000 + 300,000 = 1,950,000. Since this exceeds the overall combined limitation, the total non-deductible contribution for 2000 equals 1,950,000 – 1,650,000 = 300,000.

Answer is B

If this problem had asked for the excise tax, it is NOT based solely on the non-deductible contribution. Under RPA '94, there is an exemption from the excise tax for the lesser of (i) the DC plan contribution, or (ii) the greater of 6% of taxable compensation, or the sum of the employer matching contributions under §401(m)(4) plus the employee elective pre-tax deferrals under §402(g)(3). This excise tax exemption is only available if there are more than 100 employees covered by the DB plans whose contributions are limited.

Problem 41 - 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.

First, you can determine the Initial Accrued Liability:

$$160{,}000 = IAL * (\ddot{a}_{\overline{26}|.06} / \ddot{a}_{\overline{30}|.06})$$

$$IAL = 169{,}372$$

You are told that the each year's contribution was equal to the deductible limit, and was paid on the last day of the plan year. You can use that information to write down the 404 O/S bases, then determine the 1999 G/L base:

6% UAL = O/S §404 bases

$$90{,}000 = IAL * (\ddot{a}_{\overline{6}|.06} / \ddot{a}_{\overline{10}|.06}) + G/L$$

$$G/L = 169{,}372 * (.6681) - 90{,}000$$
$$= 23{,}159$$

Now you can use the 412 equation of balance to determine the credit balance at 12/31/99:

6% UAL = O/S §412 bases - credit balance - ARA

$$90{,}000 = 160{,}000 + G/L - CB - 0$$
$$CB = 160{,}000 - G/L - 90{,}000$$
$$= 46{,}841$$

Finally, you can determine new amortization amounts at 7% for each of the 412 bases. Don't forget to set up the new assumption change base at 01/01/00:

Assump chg base = 40,000 - 90,000 = -50,000

Assump Amort = -6,653 = -50,000 ÷ $\ddot{a}_{\overline{10}|.07}$

Gain Amort = -5,279 = -23,159 ÷ $\ddot{a}_{\overline{5}|.07}$

IAL Amort = 12,645 = 160,000 ÷ $\ddot{a}_{\overline{26}|.07}$

Problem 41 - Page 2 **Revised 06/20/06**

2000 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	51,000	Credit Balance	46,841
IAL amortization	12,645	Gain amortization	5,279
		Assump amortization	6,653
		12/31 contribution	x
7% interest	4,455	7% interest	4,114
Total charges	68,100	Total credits	x + 62,887

The next step is to check the Full Funding Limitation under §412. Since you have no current liability information, you should ignore the RPA FFL and OBRA FFL.

§412 "ERISA" FFL = (1+i)*{ NC + AL – [lesser (MVA,AAV) – CB]}
147,490 = 1.07 * { 51,000 + 270,000 – [230,000 - 46,841]}

Since the FFL exceeds the charges in the MFSA, there is no Full Funding Credit.

The minimum contribution at 12/31/00 is 68,100 – 62,887 = 5,212.

Answer is B

Problem 42

Similar to 1997 #37

I. TRUE
A 70% contribution decline occurs when 30% of "units in the high base year" exceeds the units in each year of the "three year testing period". The "three year testing period" includes the year that the 70% decline occurs as the last year. The "units in the high base year" is the average of the two highest years in five years preceding the "three year testing period". See ERISA 4205(b)(1)(A) and 4205(b)(1)(B).

You must calculate the various items to see whether a 70% decline occurred in 2000:

Assumed year	**2000**
3 year testing period	1998-2000
Base years	1993-1997
High base years	1993, 1997
Units in high base year	.5*(31,792 + 27,584) = 29,688
30% of units in high base year	8,906
Exceeds each year in 3 year testing period?	YES
70% decline occurred?	YES

II. FALSE
Employer 2 falls under the exception in ERISA 4205(b)(2)(B) for replacement of one agreement by another. Since there is no cessation of their contribution obligation, they do not satisfy the definition in ERISA 4205(a)(2) of a partial withdrawal due to a partial cessation of their contribution obligation.

III. TRUE
I originally thought that Employer 3 satisfied the definition in 4205(b)(2)(A)(ii). I now think that Employer 3 satisfies the definition in 4205(b)(2)(A)(i), where it refers to "transfers such work to another location", near the end of the paragraph. They do satisfy the definition in ERISA 4205(a)(2) of a partial withdrawal due to a partial cessation of their contribution obligation.

I and III are true

Answer is E

Problem 43 - Page 1 Similar to 1999 #46

Based on the Funded Current Liability percentage at 01/01/97 and 01/01/98, the plan is not subject to quarterly contributions for either 1998 or 1999. Since the Funded Current Liability percentage is less than 100% at 01/01/99, the plan is subject to quarterly contributions for 2000.

A key point of this problem is that you can use the credit balance at 01/01/00 to meet the quarterly contribution requirement for that year. You need to set up the MFSA for both 1998 and 1999 to calculate the credit balance at 01/01/00.

1998 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	200,000	Credit Balance	0
Net amortization	100,000	12/31 contribution	350,000
7% interest	21,000	7% interest	0
Total charges	321,000	Total credits	350,000

Since you have no information on the plan assets, you can not check the Full Funding Limitation. The credit balance at 12/31/98 is 350,000 – 321,000 = 29,000.

1999 Minimum Funding Standard Account

Charges		**Credits**	
Normal Cost	240,000	Credit Balance	29,000
Net amortization	100,000	12/31/99 contribution	150,000
		09/15/00 contribution	300,000
7% interest	23,800	7% interest	2,030
Total charges	363,800	Total credits	481,030

Since you have no information on the plan assets, you can not check the Full Funding Limitation. The credit balance at 12/31/99 is 481,030 – 363,800 = 117,230.

Problem 43 - Page 2 **Revised 06/20/06**

To calculate the required quarterly contribution for 2000, 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 1999 and 2000:

12/31/99 "MFSA excluding CB" = (240,000 NC + 100,000) * 1.07 = 363,800
01/01/00 "MFSA excluding CB" = (260,000 NC + 120,000) = 380,000

Lesser of 1999 or 90% of 2000 = Lesser of (363,800 or .90 * 380,000) = 342,000

The required quarterly installment is based on the applicable percentage multiplied by the RAP, which is 25%(342,000) = 85,500.

Based on the 450,000 contribution for 1999, the credit balance at 12/31/99 is 117,230. You may use the 01/01/00 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 300,000 contribution was paid at 09/15/00, so you can apply the credit balance towards the 10/15/00 required quarterly installment.

Date	Required	Amount Available	Overpayment (Underpayment)
04/15/00	85,500	200,000	200,000 - 85,500 = 114,500
07/15/00	85,500	114,500 * [1+ (.07)*(3/12)] = 116,504	116,504 - 85,500 = 31,004
10/15/00	85,500	31,004 * [1+ (.07)*(3/12)] + 117,230 * [1+ (.07)*(9.5/12)] = 155,273	155,273 - 85,500 = 69,773
01/15/01	85,500	69,773 * [1+ (.07)*(2.5/12)] = 70,790	70,790 - 85,500 = (14,710)

The final underpayment at 01/15/01 represents the amount the employer must contribute at that date to avoid any late quarterly contribution penalty.

Answer is B

If you incorrectly gave the 10/15/00 overpayment three full months of interest, the final underpayment at 01/15/01 would be 14,506, which is in the wrong answer range!

Problem 43 - Page 3

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)
04/15/00	85,500	200,000	200,000 - 85,500 = 114,500
07/15/00	85,500	114,500 * $(1.07)^{3/12}$ = 116,453	116,453 - 85,500 = 30,953
10/15/00	85,500	30,953 * $(1.07)^{3/12}$ + 117,230 * $(1.07)^{9.5/12}$ = 155,161	155,161 - 85,500 = 69,661
01/15/01	85,500	69,661 * $(1.07)^{2.5/12}$ = 70,650	70,650 - 85,500 = (14,850)

Of course the answer is still in range B, as it must be. If you incorrectly gave the 10/15/00 overpayment three full months of interest, the final underpayment at 01/15/01 would be 14,650, which is in the wrong answer range.

Problem 44

The rules regarding excise taxes upon asset reversion are contained in §4980 of the Internal Revenue Code. There is a 50% excise tax in general. The excise tax is reduced to 20% if either (i) there is a qualified replacement plan, or (ii) there are benefit increases at plan termination, subject to the additional requirements below.

For a qualified replacement plan, there must be at least 95% participation. The employer must transfer assets of at least 25% of the value of the reversion. You can reduce the 25% by the value of any benefit improvements within 60 days.

For the given plan, the asset reversion was initially 575,000 = 1,800,000 – 1,225,000. Since the plan sponsor is implementing a qualified replacement plan, the asset transfer must be at least 25% * (575,000) = 143,750, in the absence of any benefit increases.

The value of the 6% benefit increase is 6% * 1,225,000 = 73,500. The asset transfer can be reduced by the amount of the benefit increase:

Final asset transfer = 143,750 – 73,500 = 70,250.

Answer is C

You can grant benefit improvements at termination instead of putting in a qualified replacement plan. The improvements must have a value of at least 20% of the reversion before granting the benefit improvements (which must be uniform for all participants). Increases to non-active participants can not exceed 40% of the reversion before the benefit improvements.

Problem 45 **Revised 01/04/03**

In event of termination, a defined benefit plan must limit benefits of HCEs (or former HCEs) to amount that is not discriminatory under 401(a)(4). The regulation at 1.401(a)(4)-5(b)(3) contains the rules regarding restricted distributions. In general, it says the employee can't receive more than one year's life annuity payments in a year.

There are several exceptions to this distribution restriction at 1.401(a)(4)-5(b)(3)(iv)(A):

- After payment, plan assets ≥ 110% of current liability under 412(l)(7)
- Value of benefits payable < 1% of current liability
- Value of benefits payable < 411(a)(11)(A) mandatory L.S. amount (5,000)

	Before Distribution	Smith's Distribution	After Distribution
Current Liability	6,000,000	80,000	5,920,000
Assets	6,600,000	100,000	6,500,000
Current liability %	110%		109.80%

To satisfy the requirements of the regulation, the assets would need to be at least 110% * 5,920,000 = 6,512,000. This is 12,000 more than the actual assets after payment of Smith's lump sum. This means that if Smith's distribution were 12,000 lower, then there would be no restrictions.

Answer is B

You can check this result, based on payment of 100,000 – 12,000 = 88,000:

	Before Distribution	Modified Distribution	After Distribution
Current Liability	6,000,000	80,000	5,920,000
Assets	6,600,000	88,000	6,512,000
Current liability %	110%		110.00%

This calculation assumes payment of Smith's entire current liability. I am assuming that we used a different set of lump sum factors to produce the 88,000 distribution.

Problem 46 - Page 1

Similar to 1998 #31

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.

This problem makes your life easier by giving you the PVNC under the Frozen Initial Liability method. Most problems require you to derive its value.

§404 PVNC = 600,000 (given)
PVE / E = 6,400,000 / 400,000 = 16.00
§404 NC = 37,500

You need to calculate the deductible limit for 2000, which is defined as normal cost plus limit adjustments. The only limit adjustment is for the Initial Accrued Liability:

Limit adjustment = $400{,}000 \;/\; \ddot{a}_{\overline{10}|.07}$ = 53,225

Deductible limit = (37,500 + 53,225) * 1.07 = 97,076

The next step is to check the Full Funding Limitation under §404. A key point is that, in 1999 and 2000, the OBRA 87 FFL current liability is multiplied by 155%.

§404 "ERISA" FFL = (1+i)*(NC + AL - (lesser MVA,AAV))
96,300 = 1.07 * (30,000 + 550,000 – 490,000)

§404 "OBRA 87" FFL = 1.55 (12/31 CL) - (1+i)*(lesser MVA,AAV)) (if no benefit payments)
111,200 = 1.55 * 410,000 - 1.07 * 490,000

§404 "RPA 94" FFL = .90 (12/31 RPA CL) - (1+i)*(AAV) (if no benefit payments)
Zero = .90 * 410,000 - 1.07 * 490,000

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.

Problem 46 - Page 2 **Revised 12/18/02**

The final §404 FFL value is the greater of the RPA '94 floor, and the lesser of the ERISA and OBRA FFL values, or 96,300. 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 96,300, or the greater of the normal cost plus limit adjustments of 97,076 and the minimum contribution. The final result is 96,300, 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, so this plan is not eligible for the deductible limit based on UCL. As is typical in these problems, the UCL is zero, so it would not have any effect anyway.

Based on the information given in the problem, the 412 normal cost and PVNC are both equal to the 404 values. Based on the general exam conditions, you can assume that all prior contributions have been deducted, so the assets and unfunded accrued liability values are the same under both §404 and §412:

§404 PVNC = PVB - §404 UAL - §404 AAV = 600,000 (given)
§412 PVNC = PVB - §412 UAL - §412 AAV = 600,000

The last step in the problem is to determine the 412 amortization, and complete the MFSA for 2000:

IAL Amortization = 30,126 = $400{,}000 \div \ddot{a}_{\overline{30}|.07}$

2000 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	37,500	Credit Balance	0
IAL amortization	30,126	12/31 contribution	96,300
7% interest	4,734	7% interest	0
Total charges	72,360	Total credits	96,300

With a zero credit balance, the 412 Full Funding Limitation will have the same value as under 404. Since it exceeds the AFD of 72,360, it will not have any effect. The credit balance at 12/31/00 is 96,300 – 72,360 = 23,940.

Answer is D

Problem 47 Similar to 1998 #38 **Revised 01/07/02**

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 400,000 - 20,000, or 380,000. The PV of accrued benefits is 180,000, which is less. You already have the values for PVAB allocated on a plan termination basis.

You are given the allocated market value of assets for each plan. This problem makes your life easy compared to other problems, which normally require you to perform an asset allocation. Note that the plan sponsors in this spinoff are not in the same controlled group, so the rules of IRC §414(l)(2) do not apply.

	Credit balance Allocation: Description of item	Total Plan A	Plan B	Plan C
(1)	Market value	400,000	80,000	320,000
(2)	Credit balance	20,000		
(3)	Market value minus credit balance	380,000		
(4)	PV of AB on termination basis	180,000	58,000	122,000
(5)	Lesser of (3) and (4)	180,000		
(6)	Step "A" => alloc (4) on PBGC basis	180,000	58,000	122,000
(7)	Market value minus Step "A"	220,000	22,000	198,000
(8)	Applicable percentage	100%	10.00%	90.00%
(9)	Allocated credit balance	20,000	2,000	18,000

The credit balance for plan B is 2,000.

Answer is A

Problem 48 - Page 1 Similar to 1998 #37

§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 based on 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		
	= 29,500,000	=	50,000,000 – 20,500,000
PVE / E	= 48,000 / 5,000	=	9.60
§404 NC	= 3,072,917		
Limit adj	= zero		
NC + Limit adj	= 3,072,917		

You have no accrued liability information, so you can't check the Full Funding Limitation. The deductible limit will be the greater of the normal cost plus limit adjustments, or the minimum under §412. Since the credit balance is zero, the §412 minimum also equals the Normal cost plus limit adjustments of 3,072,917.

The final comparison is to the unfunded current liability, since this is a non-multiemployer plan with more than 100 participants:

§404 UCL = 4,000,000 = 24,500,000 – 20,500,000

The final deductible limit is 4,000,000. Based on the 12/31 payment of 3,500,000, the actual deduction for the year is 3,500,000 for the DB plan.

Problem 48 - Page 2

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 5,000,000, which gives 750,000.

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 deduction based on unfunded current liability.

Based on the previous calculations, the DB plan minimum is less than the DB plan deductible limit of 3,500,000. 25% of taxable compensation equals 1,250,000. The overall deduction limitation is the greater of the two values, or 3,500,000.

The sum of the actual contributions for the two plans is 3,500,000 + 1,000,000 = 4,500,000. Since this exceeds the overall deduction limitation, the total non-deductible contribution for 2000 equals the total contribution minus the overall deduction limitation:

4,500,000 – 3,500,000 = 1,000,000 NDC

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 (i) the DC plan contribution, or (ii) the greater of 6% of taxable compensation, or the sum of the employer matching contributions under §401(m)(4) plus the employee elective pre-tax deferrals under §402(g)(3). This excise tax exemption is only available if there are more than 100 employees covered by the DB plans whose contributions are limited.

This exemption equals the lesser of the 1,000,000 DC plan contribution, or 6%(5,000,000) = 300,000. The excise tax is 10% of the non-deductible contribution of 1,000,000 minus the 300,000 that is exempt from the excise tax. The final excise tax is 10%(1,000,000 – 300,000) = 70,000.

Answer is B

Problem 49

Similar to 1998 #19

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 do not have the Entry Age Normal cost, you can not calculate the FFL values.

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)

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. The assumption change base will be amortized over 30 years instead of 10 years.

UAL = O/S bases – CB – ARA
= 1,100,000 + 700,000 + 650,000 – 500,000 – 0
= 1,950,000

PVNC = PVB – AAV – UAL
= 4,550,000 = 18,000,000 – 11,500,000 – 1,950,000
PVL / L = 1,225 / 150 = 8.16667
NC = 557,143

IAL amortization = $1{,}100{,}000 / \ddot{a}_{\overline{19}|.07}$ = 99,466

Plan amortization = $700{,}000 / \ddot{a}_{\overline{20}|.07}$ = 61,752

Assump amortization = $650{,}000 / \ddot{a}_{\overline{30}|.07}$ = 48,954

2000 Minimum Funding Standard Account

Charges		Credits	
Normal Cost	557,143	Credit Balance	500,000
IAL amortization	99,466		
Plan amortization	61,752		
Assump amortization	48,954	12/31 contrib	x
7% interest	53,712	7% interest	35,000
Total charges	821,027	Total credits	x + 535,000

The minimum contribution payable 12/31/00 is 821,027 - 535,000 = 286,027.

Answer is C

Problem 50 **Revised 07/09/01**

The key point to this problem is the fact that both Smith and Jones can grow into the 30 years of service to receive an unreduced benefit after age 60. The reason is that, under a standard (not distress) plan termination, all benefits through PC6 must be funded. Based on Revenue Ruling 86-48, the value of PC6 benefits includes these "future" early retirement subsidies.

You are given premium rates at different ages, and you need to calculate which benefit commencement age produces the greatest present value of benefits. That age will correspond to the most valuable benefit.

In general, you would expect the highest present value at the first age where the participant is eligible for unreduced benefits. The reason is that their benefit will be the same at later ages, but the present value factor will be lower. Note that the age 62 present value factors were not given for Jones, so they are not shown in the table below.

Data as of 01/01/01	**Smith**	**Jones**
Service	28	20
Age	60	50
Monthly Accrued Ben	3,000	2,000
Benefit Commencement @ 60		
Service	28	30
Early ret reduction	.70 = 1-5(.06)	1.0 (unreduced)
Monthly Early ret benefit	2,100 = .70(3,000)	2,000
Monthly Present value	25,001 = 2,100(11.905)	12,738 = 2,000(6.369)
Benefit Commencement @ 62		
Service	30	
Early ret reduction	1.0 (unreduced)	
Monthly Early ret benefit	3,000	
Monthly Present value	30,072 = 3,000(10.024)	
Benefit Commencement @ 65		
Service	33	35
Early ret reduction	1.0 (unreduced)	1.0 (unreduced)
Monthly Early ret benefit	3,000	2,000
Monthly Present value	22,893 = 3,000(7.631)	8,166 = 2,000(4.083)

The most valuable present values are at age 62 for Smith, and age 60 for Jones:
Monthly most valuable PVB = 30,072 + 12,738 = 42,810.

The asset reversion to the employer is 86,280 = 600,000 – 12(42,810).

Answer is A

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