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2007 EA-2B EXAM SOLUTIONS

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2007 EA-2B Exam Solutions

These solutions were prepared based on the law as in effect at December 31, 2006.

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 was similar to the 2004, 2005 and 2006 exams, with far fewer calculation type problems than prior years. There were more 2 and 3 point problems that tested general pension knowledge than in earlier years.

Revision History:

March 8, 2012	Corrected solution for problem 32
April 25, 2009	Corrected solution for problem 30
April 21, 2009	Clarified solution for problem 33
March 20, 2009	Corrected solutions for problems 32 and 34
April 28, 2008	Corrected solutions for problems 20, 24 and 26
April 22, 2008	Corrected solutions for problems 15, 22, 30 and 31
March 30, 2008	Corrected solution for problem 33
January 31, 2008	Original solutions

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Problem 1

TRUE

There is a specific exception in the code that allows you to exclude years of service that are prior to the plan effective date for vesting purposes.

See IRC Section 411(a)(4)(C)

Answer is A

Problem 2

FALSE

The regulation has a detailed description of the reportable event. Since the distribution within a 12 month period ending on the event is less than 10,000, a reportable event has not occurred:

“4043.27(a) **Reportable event.** A reportable event occurs for a plan when --

- (1) There is a distribution to a substantial owner of a contributing sponsor of the plan;
- (2) The total of all distributions made to the substantial owner within the one-year period ending with the date of such distribution exceeds \$10,000;
- (3) The distribution is not made by reason of the substantial owner's death; and
- (4) Immediately after the distribution, the plan has nonforfeitable benefits (as provided in § 4022.5) that are not funded.”

Answer is B

Note that there are also several waivers for this reportable event at 4043.27(c).

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Problem 3

FALSE

There is no exception in ERISA 101(f) for filing of the annual funding notice.

Answer is B

Problem 4

TRUE

Smith's accrued benefit did not change in 2007, since they have more than 25 years of participation service. For testing under 410(b) and 401(a)(4), Smith is still treated as benefiting under the plan.

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

Answer is A

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Problem 5

TRUE

There is nothing in the 901 regulations that prohibits such practice by an enrolled actuary

Answer is A

Problem 6

FALSE

The definition of Qualified J&S annuity in 417(b) allows any value between 50% and 100%. It does not have to be the highest continuation percentage defined under the plan.

Answer is B

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Problem 7

TRUE

This question tests a tiny detail that is really an EA-2A exam topic. This particular item is no longer meaningful, due to PPA 2006.

In the PBGC-1 instructions for Schedule A, it defines the unfunded vested benefits under the General Rule based on the current liability under ERISA 302(d)(7). The exclusion for pre-participation service is in 302(d)(7)(D).

The instructions state that the current liability should be based on “the actuarial assumptions and methods used are those used by the plan for purposes of determining the minimum funding contributions under section 302 of ERISA and section 412 of the Code for the premium payment year ...”

For the Alternative Calculation method, the current liability value used comes from the Schedule B for the prior plan year. The specific items used are from lines 2b(1), 2b(2) and 2b(3) of the Schedule B. These are the current liability figures for the minimum funding valuation, and they would include the effect of the election to exclude pre-participation service.

Answer is A

Problem 8

TRUE

This is a waiver in IRC 4974(d). The Secretary of the Treasury may waive the tax if the taxpayer can demonstrate the incorrect amount distributed was due to reasonable error, and reasonable steps are being taken to remedy the problem.

Answer is A

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Problem 9

TRUE

The definition of a required aggregation group under 416 includes all plans which contain at least one key employee.

See Q&A T-6 in the regulation at 1.416.

Answer is A

Problem 10

FALSE

When a spinoff occurs where there are excess assets, there is a rule that applies when the spun off plans are in the same controlled group. The allocation rule requires that the allocation is based on the excess of the sum of the Target Normal Cost and the Funding Shortfall over the plan termination liability.

See IRC 414(l)(2).

Answer is B

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Problem 11

FALSE

The 415 limits are defined on an annual basis, using the limitation year. They are not applied on a monthly basis.

See IRC 415(b)(1)

Answer is B

Problem 12

TRUE

The point of the question is that calculations under the General Rule must reflect the plan population and plan provisions at the snapshot date. For a calendar year plan, the snapshot date for the 2007 variable rate premium is 12/31/06.

According to the instructions for Schedule A of the PBGC-1 form, the actuary should use the same assumptions and methods that were used in the valuation for minimum funding purposes “for the plan year in which the premium snapshot date falls ...” This is the point of the question, and why it refers to the valuation method for the 2006 plan year.

Answer is A

I found this question relatively confusing. The asset valuation method is used to determine the actuarial asset value. But this is not used under the General Rule. General Rule filers use the excess of the current liability over the market value of assets.

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Problem 13

TRUE

There is a general rule that post-termination amendments are allowed, as long as they don't decrease any participant's benefit. But there are exceptions that allow an amendment that decreases benefits in certain cases.

See regulation section 4041.8 on Post-termination amendments.

Answer is A

Problem 14

Similar to 2000 #13

TRUE

In section 415(d)(1)(B), it allows you to apply cost of living adjustments to the 415(b)(1)(B) three year compensation limit, but only if the participant is separated from service.

The way this question is worded, the plan document can specify that benefits for any participant will be increased with cost of living adjustments. But the plan should state that the benefit payable in any year can't exceed the 415 limit.

Answer is A

Problem 15

Revised 04/22/08

FALSE

It does not make sense that you could include a 2007 plan year contribution in the assets. For variable rate premium purposes, the assets generally can include contributions attributable to plan years preceding the premium payment year.

See Q-13 of PBGC Technical Update 96-3.

Answer is B

Problem 16

FALSE

In the regulation at 901.20(b), it states that

“(b) Professional duty.

An enrolled actuary shall not perform actuarial services for any person or organization which he/she believes or has reasonable grounds for believing may utilize his/her services in a fraudulent manner or in a manner inconsistent with law.”

Answer is B

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Problem 17 - Page 1

Similar to 2005 #26

This problem tests your knowledge of the method for adjusting assets and discounting contributions under the Alternative calculation method (ACM) for calculating the Variable Rate Premium (VRP) on the PBGC-1 Form, Schedule A.

Since this is the 2007 PBGC premium calculation under the ACM, the determination date is 01/01/2006. You must calculate the adjusted liability values. Here is the formula (from the tables given with the exam):

$$VB_{adj} = VB_{pay} * 0.94^{(RIR-BIR)} + [VB_{Nonpay} * 0.94^{(RIR-BIR)} * ((100+BIR)/(100+RIR))^{(ARA-50)}]$$

In the formula, RIR equals 5.00 and BIR equals 5.10 (100 times the 2007 required interest rate and the 2006 current liability interest rate, respectively). One key point of the problem is that, for participants who are not in pay status, the formula given does not include the 1.07 adjustment in the PBGC-1 instructions.

	In pay status	Not in pay status
Group	Retired	Active and terminated vested
Unadjusted vested liability	2,154,000	3,618,000
Adjustment factor	$.94^{(5.00-5.10)}$ = 1.0062	$1.07 * (.94^{(5.00-5.10)}) * [(105.10/105.00)^{(65-50)}]$ = 1.0921
Adjusted vested liability	2,167,369	3,951,307

The total adjusted vested current liability at 01/01/06 is 6,118,677.

Next, you start with the actuarial asset value at 01/01/06, 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:

$$\begin{aligned} 01/06 \text{ Adjusted assets} &= (5,234,000 - 250,000) \\ &\quad + 250,000 * (1.0500)^{(-6/12)} + 330,000 * (1.0500)^{(-12/12)} \\ &= 5,542,261 \end{aligned}$$

$$\begin{aligned} 01/06 \text{ Unfunded vested liability} &= 6,118,677 - 5,542,261 \\ &= 576,416 \end{aligned}$$

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:

$$\begin{aligned} 01/07 \text{ Unfunded vested liability} &= 576,416 * 1.0500 \\ &= 605,237 \end{aligned}$$

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Problem 17 - Page 2

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:

$$\begin{aligned} \text{2007 Variable rate premium} &= 606,000 * .009 \\ &= 5,454 \end{aligned}$$

Answer is B

NOTES:

1. The easy way to miss the problem is to assume the 01/01/2007 contribution is included in the actuarial asset value at 01/01/06. But that contribution is for the 2006 plan year, and would never be included in the actuarial asset value for 2006.
2. 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.
3. 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.

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Problem 18 - Page 1

Similar to 2003 #17

This is one of the few questions on the DB / DC cross testing gateway rules. You are told that the plans are permissively aggregated for testing.

There are three DB / DC cross testing gateway rules:

- Broadly available separate plans
- Primarily defined benefit in character
- Minimum aggregate allocation gateway

In this problem, you are told that the plans will satisfy the minimum aggregate allocation gateway. The minimum aggregate allocation gateway consists of two different rules. The plan only has to satisfy one of the two rules.

This gateway test requires you to calculate an equivalent normal allocation rate under the DB plans. The test uses the aggregate allocation rate for the aggregated DB/DC plan. You are not allowed to impute permitted disparity in determining the allocation rates.

To satisfy this gateway test, if the HCE rate is 15% or less, the NHCEs must have an allocation rate equal to at least 1/3 of the highest allocation rate for any HCE in the plan. If the HCE rate is above 15%, but less than or equal to 25%, then the minimum allocation rate for the NHCEs is 5%.

If the HCE rate is above 25%, but less than or equal to 30%, then the minimum allocation rate for the NHCEs is 6%. For each higher range of 5 percentage points for the HCE rate, the NHCE minimum allocation rate is 1/5 of the top end of the range.

The first step is to calculate the equivalent allocation rates for the HCE. This requires cross testing the DB plan accrual on a contributions basis:

	HCE
12/31/2007 age	55
DB Annual accrual	8,000
Lump sum value at 65	$8,000(8.375) = 67,000$
Discounted value at 8.5%	$67,000(1.085)^{-10} = 29,633$

DC allocation	25,000
Total allocation	54,633
Pay limited by 401(a)(17)	225,000
Allocation rate	$54,633 / 225,000 = 24.28\%$

The final result is the equivalent allocation rate for 2007. Since this is less than 25%, the minimum aggregate allocation rate for the NHCEs is 5%.

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Problem 18 - Page 2

Now you need to do calculations for all three NHCEs

	NHCE1	NHCE2	NHCE3
DC allocation	1,400	2,000	1,200
DC allocation rate	$1,400 / 20,000$ $= 7.00\%$	$2,000 / 30,000$ $= 6.67\%$	$1,200 / 40,000$ $= 3.00\%$

It is clear that the first two NHCEs already satisfy the minimum aggregate allocation rate of 5.0%. Now you can solve for the value of X so the third NHCE has an aggregate allocation rate of 5.0%. They must have an equivalent allocation rate from the DB plan of exactly 2.0% = 5.0% - 3.0%.

	NHCE3
12/31/2007 age	63
DB Annual accrual	X
Lump sum value at 65	$X(8.375)$
Discounted value at 8.5%	$X(8.375)(1.085)^{-2}$
Allocation rate	$\frac{X(7.114)}{40,000}$

$$\begin{aligned} X(7.114) / 40,000 &= 2.0\% \\ X(7.114) &= 800 \\ X &= 112.45 \end{aligned}$$

This produces an answer of C, which is unfortunately incorrect. The key to this problem is that there is another option available.

You have a more favorable alternative than requiring every NHCE to receive the minimum aggregate allocation. Instead of using each participant's equivalent normal allocation rate under the DB plan, you can use the average of the equivalent normal allocation rate under the DB plan for all NHCEs benefiting under the plan.

	NHCE1	NHCE2	NHCE3
12/31/2007 age	40	42	63
DB Annual accrual	400	475	X
Lump sum value at 65	$400(8.375)$ $= 3,350$	$475(8.375)$ $= 3,978$	$X(8.375)$
DB equivalent allocation	$3,350(1.085)^{-25}$ $= 436$	$3,978(1.085)^{-23}$ $= 609$	$X(8.375)(1.085)^{-2}$ $= X(7.114)$
Pay limited by 401(a)(17)	20,000	30,000	40,000
DB equivalent allocation rate	$436 / 20,000$ $= 2.18\%$	$609 / 30,000$ $= 2.03\%$	$\frac{X(7.114)}{40,000}$

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Problem 18 - Page 3

You can see that the DB equivalent allocation rates for the first two NHCEs are greater than 2.0%. When you solve for X so that the average value for all three NHCEs is equal to 2.0%, the resulting DB equivalent allocation rate for the third NHCE will be less than 2.0%.

$$\begin{aligned} [2.18\% + 2.03\% + X(7.114) / 40,000] / 3 &= 2\% \\ X(7.114) / 40,000 &= 1.79\% \\ X(7.114) &= 716 \\ X &= 100.65 \end{aligned}$$

Answer is B

NOTES:

There is a bit more to this minimum aggregate allocation gateway, which we could ignore for the problem solution:

- A second alternative rule is that each NHCE has an allocation rate of 7.5% or more. In this problem, that would clearly give a much larger value for X. This calculation must use a 415(c) definition of compensation, which is essentially total compensation. Total compensation is used so the dollar allocation based on the 7.5% rate is as large as possible.
- One thing to realize is that not all NHCEs would get this minimum allocation. The only ones who must receive the minimum allocation are those participants that also benefit under the profit sharing plan.

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Problem 19

This is a fairly simple question on 411(d)(6) protected benefits. In the 1.411(d)-4 regulation, it states that 411(d)(6) protected benefits can't be reduced, eliminated or made subject to employer discretion, except as provided by regulation.

The 411(d)(6) protected benefits include benefits in these categories:

- §411(d)(6)(A) accrued benefits
- §411(d)(6)(B)(i) early retirement benefits and retirement type subsidies
- §411(d)(6)(B)(ii) optional forms of benefit

The key point of the problem is that the participant's accrued benefit at 01/01/02 provides a minimum "floor" early retirement benefit. At each subsequent age, you must compare the early retirement benefit based on the new 5% per year reduction factors against the early retirement benefit using the 01/01/02 accrued benefit and the 4% per year reduction factors.

Date	01/01/02	01/01/07
Age	55	60
Service	25	30
Accrued benefit	12,000	15,000 = 12,000 + 5(1%)(60,000)

The monthly early retirement benefit based on the frozen accrued benefit and 4% reduction factors is $800 = (12,000/12) * (1 - 5(4\%))$. The monthly early retirement benefit based on the 01/01/07 accrued benefit and 5% reduction factors is $937.50 = (15,000/12) * (1 - 5(5\%))$.

Answer is B

NOTE:

The regulation uses a "wear away" concept, where future benefit accruals eventually produce a larger benefit than the one based on the frozen accrued benefit at 01/01/02. As shown below, this happens at age 58:

Age	55	56	57	58	59	60
Service	25	26	27	28	29	30
Accrued benefit	1,000	1,050	1,100	1,150	1,200	1,250
Early retirement benefit using 5%	500	578	660	748	840	938
Minimum benefit using 4%	600	640	680	720	760	800

There is a much more complicated procedure that some pension plans use in the situation described by this problem. The technique is sometimes called "bifurcating the benefit", and it goes well beyond the requirements of the 1.411(d)-4 regulation. Unfortunately, it results in the wrong answer range.

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Problem 20 - Page 1

Similar to 2005 #32

Revised 04/28/08

The key to this problem is knowing what "the minimum required pre-retirement death benefit" means. This refers to the qualified pre-retirement spouse annuity (QPSA). This is an annuity type similar to a qualified joint and survivor annuity, which is defined in 417(b)(1) as a joint and survivor annuity of at least 50%.

One confusing point is the wording in the problem. The description of the death benefit states that it is "payable at the latest date permitted by law". Then you are told that the spouse elects to receive the benefit at "the earliest date allowed under the plan." Both of those sentences refer to the same payment date.

In 417(c)(1)(A)(ii), if the participant dies prior to their earliest retirement age, the annuity should commence at that earliest retirement age. Based on the plan provisions, Smith's earliest retirement age is 55, since they have completed 7 years of service at death. The calculations below are based on benefit commencement in five years, when Smith would reach age 55.

You are told the participant has been married for more than one year, so it is necessary to provide the QPSA (see 417(d)). The majority of the problem solution is a benefit calculation.

As of 01/01/2007

Age	50
Service	7
Earliest Retirement Age	55

Accrued Benefit	12,000
Vesting percentage	100%
Vested benefit	12,000

Early Retirement reduction	0.80
	$= 1 - 2.0\% * (65 - 55)$
Benefit payable at age 55	9,600

50% J&S Reduction	95%
50% J&S Benefit	9,120
50% Death benefit	4,560

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Problem 20 - Page 2

Most prior exam problems stopped with the calculation of the QPSA benefit amount. This is the first time they ask for the calculation of the present value.

One minor surprise in the question is that you are given commutation functions. This is the first time commutation functions have been on the exam since 1999.

Smith's spouse is also age 50, so you need to discount the benefit for 5 years with interest and mortality:

$$\begin{aligned} PV &= 4,560 * v^5 p_{50} * \ddot{a}_{55}^{(12)} \\ &= 4,560 * (D_{55} / D_{50}) * \ddot{a}_{55}^{(12)} \\ &= 4,560 * [(D_{65} / D_{50}) / (D_{65} / D_{55})] * \ddot{a}_{55}^{(12)} \\ &= 4,560(.3880/.5253)(13.15) \\ &= 44,291 \end{aligned}$$

Answer is B

NOTE

The answer ranges seem very wide to me. I guess they tried to allow for students who had no idea what a commutation function was.

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Problem 21

This is a very short question on the requirements of the 401(a)(4) regulation. In event of termination, a defined benefit plan must limit benefits of the top paid 25 HCEs (or former HCEs) to an 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 \geq 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)

I. TRUE

II. FALSE

As shown above, the threshold for the benefit payable is NOT based on the plan assets.

III. TRUE

Items I and III are True.

Answer is B

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Problem 22 - Page 1

Similar to 2005 #39

Revised 04/22/08

The key to working this problem is knowing some small details in the regulations. You need to calculate the average benefit percentage test result for two plans with different plan years. At 1.410(b)-5(d), it states that you should use the plan years that end in the same calendar year.

You have the profit sharing results for the plan year ending 12/31/06. You should use the compensation and benefit accruals for the DB plan for the plan year ending in 2006.

The 1.401(a)(4)-8(d) regulation covers cross-testing of DB or DC plans. When you cross-test a DB plan on a contribution basis, you need to convert the life annuity payments to a lump sum at the current age.

At 12/31/2006, you are told that Smith is age 40. The problem states that the annual benefit accrual for the plan year ending in 2006 is 1,500. You need to calculate the present value at testing age 65, and discount it back to today at the 8.0% standard interest rate.

Several students complained about the data given regarding catch-up salary deferrals. For someone age 40, this is incorrect. But the catch-up contributions would never be used anyway, so it does not affect the solution to the problem.

$$\ddot{a}_{65}^{(12)} = 9.35$$

$$\begin{aligned}\text{PV at age 65} &= 1,500 * 9.35 \\ &= 14,025\end{aligned}$$

$$\begin{aligned}\text{LS amount at 40} &= 14,025 * (1.08)^{-(65-40)} \\ &= 2,048\end{aligned}$$

At this point, you have converted the 1,500 increase in the accrued benefit into an equivalent allocation of 2,048.

Note that you can not simply add up all the allocations, and determine the allocation rate. The reason is that you have different compensation for the different plan years.

$$\begin{aligned}\text{DB Allocation \%} &= 2,048 / 80,000 \\ &= 2.56\%\end{aligned}$$

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Problem 22 - Page 2

Profit sharing plan	7,200
401(k) deferral	<u>5,000</u>
Total	12,200

DC Allocation % = $12,200 / 75,000$
 = 16.27%

The total allocation rate is $18.83\% = 2.56\% + 16.27\%$

Answer is C

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Problem 23 - Page 1

Similar to EA-2B 2006 #29

The problem asks for the outstanding balance of the funding standard account bases for Plan C after the spinoff. You know what the total amount is for Plan A prior to the spinoff:

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

$$\begin{aligned}\text{O/S 412 bases} &= \text{UAL} + \text{CB} + \text{ARA} \\ &= \text{AL} - \text{AAV} + \text{CB} + \text{ARA} \\ &= 140,000,000 - 110,000,000 + 15,000,000 + \text{zero} \\ &= 45,000,000\end{aligned}$$

In order to determine the value for Plan C, you need to allocate the AAV and the CB to each plan. The rules for doing this are contained in Revenue Ruling 81-212 and Revenue Ruling 86-47.

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 minus the CB is $100,000,000 - 15,000,000$, or $85,000,000$. The PV of accrued benefits is $160,000,000$ ($60,000,000 + 30,000,000 + 40,000,000 + 30,000,000$), which is greater. You already have the values for PVAB allocated on a plan termination basis. You need the allocated market value of assets to complete the allocation of the credit balance.

Market value allocation

You can allocate the net amount of $85,000,000$ to each spun off plan using this allocation rule: $100\% \text{ PC3} + 83.333\% \text{ PC4}$. The value of 83.333% is calculated as follows:

$$\begin{aligned}83.333\% &= (\text{MVA} - \text{CB} - \text{PC3}) / \text{PC4} \\ &= (100,000,000 - 15,000,000 - 60,000,000) / 30,000,000\end{aligned}$$

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Problem 23 - Page 2

You can allocate the market value of 100,000,000 to each spun off plan using this allocation rule: 100% PC3 + 100% PC4 + 25% PC5. The value of 25% is calculated as follows:

$$\begin{aligned} 25\% &= (\text{MVA} - \text{PC3} - \text{PC4}) / \text{PC5} \\ &= (100,000,000 - 60,000,000 - 30,000,000) / 40,000,000 \end{aligned}$$

	Total Plan A	Plan B	Plan C
(1) Lesser of MVA-CB and PVAB on PBGC basis	85,000,000		
(2) Step "A": Allocate (1) on PBGC basis	85,000,000	23,000,000	62,000,000
(3) Allocate market value on PBGC basis	100,000,000	24,750,000	75,250,000
(4) Market value less Step "A": (3) - (2)	15,000,000	1,750,000	13,250,000
(5) Allocate credit balance: 100% * (4)	15,000,000	1,750,000	13,250,000

Outstanding bases 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. It has a fairly complicated rule that is used to allocate the outstanding 412 bases for aggregate type cost methods.

In this problem, you can directly write down the UAL for each spun off plan. The only allocation that you have to make is for the AAV. In Revenue Ruling 81-212, it states that you should allocate the AAV using the market value of assets:

$$\begin{aligned} \text{AAV} / \text{MVA} &= 110,000,000 / 100,000,000 \\ &= 110\% \end{aligned}$$

	Total Plan A	Plan B	Plan C
(1) Allocate market value on PBGC basis	100,000,000	24,750,000	75,250,000
(2) Allocate AAV on market value	110,000,000	27,225,000	82,775,000
(3) Accrued liability (given)	140,000,000	34,000,000	106,000,000
(4) UAL = AL - AAV = (3) - (2)	30,000,000	6,775,000	23,225,000
(5) Allocated credit balance	15,000,000	1,750,000	13,250,000
(6) O/S bases = UAL + CB = (4) + (5)	45,000,000	8,525,000	36,475,000

Answer is C

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Problem 24

Revised 04/28/08

This problem asks for the lowest amount of the variable rate premium for 2007. This normally requires calculations under both the General Rule and the ACM.

In this problem, you don't have any current liability values at 12/31/06. At first glance, you can't do any calculations under the General rule. But there is a bit of a trick to the problem.

The plan is frozen, and the only source of gain or loss is the assets. You can project the RPA 94 current liability at 12/31/06. Since there is no benefit accrual for 2006, and there is no assumption gain or loss, the liability grows at the 5% current liability interest rate:

$$12/31/06 \text{ CL} = 630,000 = 1.05(600,000)$$

The resulting unfunded current liability is zero, since the 12/31/06 assets equal 640,000. The variable rate premium under the General Rule must also be zero.

Answer is A

There is no need to determine the premium under the Alternate Calculation Method instead of the General Rule. The final answer to the problem can't be lower than zero. If you use the ACM instead of the General rule, you do get in the wrong answer range!

For the 2007 PBGC premium calculation under the ACM, the determination date is 01/01/2006. Unlike problem 17, you do not need to calculate the adjusted liability value using the formulas given in the tables with the exam. The reason is that the current liability values were calculated using the 2007 required interest rate.

You must still make the adjustment to the current liability using the 1.07 factor for those not yet in pay status. There are no adjustments to the actuarial asset value at 01/01/06, since there are no receivable contributions.

$$01/06 \text{ Unfunded vested liability} = 62,000 = 1.07 * 600,000 - 580,000$$

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:

$$\begin{aligned} 01/07 \text{ Unfunded vested liability} &= 62,000 * 1.05 \\ &= 65,100 \end{aligned}$$

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:

$$\begin{aligned} 2007 \text{ Variable rate premium} &= 66,000 * .009 \\ &= 594 \end{aligned}$$

2007 EA-2B Exam Solutions

Problem 25 – Page 1

Similar to 2006 #28

WARNING

Solutions to the 2007 EA-2B exam questions on IRC Section 415 were based on the law in effect at 12/31/06. This solution does not reflect the final 415 regulation, which became effective in April of 2007.
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WARNING

This is a typical §415 problem. The key point of the problem is the calculation of the optional form adjustment factor for the §415 limit.

Starting in 1997, earnings under §415 is defined as total compensation (not taxable). Earnings under §415 is not subject to the §401(a)(17) limit.

At 01/01/07

Age	62
Service	12 years
Participation	9 years

PLAN BENEFIT

The problem states that the final benefit paid to Smith is the maximum allowable under IRC Section 415.

415 COMP LIMIT

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

$$\begin{aligned}\$415 \text{ compensation limit} &= 200,000 * (10/10) \\ &= 200,000\end{aligned}$$

415 DOLLAR LIMIT

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

$$\begin{aligned}\$415 \text{ dollar limit during 2007} &= 180,000 \text{ at age 62} * (9/10) \\ &= 162,000\end{aligned}$$

The 415 limit on a life annuity basis is the lesser of the compensation limit of 200,000 and the dollar limit of 162,000.

2007 EA-2B Exam Solutions

Problem 25 - Page 2

FORM OF PAYMENT

The trick to the problem is that the optional form is not a Qualified J&S, since the beneficiary is Smith's son. You need to calculate the adjustment factors to allow for payment on the optional form of 100% Joint and Survivor.

IRC §415(b)(2)(E)(i) says to use the lesser of 5% and the interest rate specified in the plan to adjust the §415 dollar limit for form of payment. But you actually calculate two separate factors, and use the lesser of the two results.

The 415 limit must be adjusted to the 100% Joint and Survivor optional form using this factor: $\ddot{a}_{62} / \ddot{a}_{62:40}$. Note that the problem gives you annual annuity factors, since it defines the benefit as an annual Joint and Survivor annuity:

$$\begin{aligned} 100\% \text{ J\&S adjustment} &= 13.14 / 18.13 \\ (\text{Mandated basis } 5\% \text{ app. mortality}) &= .7248 \end{aligned}$$

$$\begin{aligned} 100\% \text{ J\&S adjustment} &= 12.85 / 17.53 \\ (\text{Plan basis } 5.25\% \text{ app. mortality}) &= .7330 \end{aligned}$$

The lesser of the two factors is .7248. The final 415 limit on the 100% J&S optional form is $117,412 = .7248 * 162,000$.

Answer is A

NOTES:

1. The 415 limit does not have to be reduced if the payment form is a Qualified joint and survivor annuity. In IRC Section 417, it defines a Qualified joint and survivor annuity as an annuity
 - (1) for the life of the participant with a survivor annuity for the life of the spouse which is not less than 50 percent of (and is not greater than 100 percent of) the amount of the annuity which is payable during the joint lives of the participant and the spouse, and
 - (2) which is the actuarial equivalent of a single annuity for the life of the participant.
2. In general, the adjustment of the 415 limit for form of payment on the mandated basis uses the 5% interest rate. When the form of payment is subject to 417(e)(3), such as a certain only annuity, or a lump sum, the mandated basis uses the applicable interest rate instead of the 5% interest.

2007 EA-2B Exam Solutions

Problem 26

Similar to 2006 #38

Revised 04/28/08

§4980(a) of the Internal Revenue Code states that the excise tax upon reversion is 20%.

§4980(d) states that the excise tax increases to 50% unless either

- The employer establishes (or maintains) a “qualified replacement plan”, or
- The employer grants certain benefit increases prior to plan termination.

The general definition of a qualified replacement plan includes 95% participation by continuing employees from the terminating plan, plus an asset transfer of at least 25% of the excess assets. You can reduce the 25% asset transfer by the value of benefit improvements made within 60 days of the plan termination.

The amount of the taxable reversion to the employer will be reduced by the asset transfer to the qualified replacement plan. Calculate the initial reversion amount as the difference between the market value of assets and the plan termination liability.

The first step in this problem is to calculate the liability at plan termination. Both participants elect the lump sum option. Be careful to use the NRA of 62 to calculate the lump sum.

The minimum lump sum under 417(e) is calculated using the applicable interest rate of 5.5% and the applicable mortality table. The plan interest rate is 7% and the plan mortality is also the applicable mortality table. It should be clear that the 417(e) lump sum will be higher:

At 01/01/07	Smith	Jones	Total
Age	45	35	
Accrued Ben	328	254	
PV of AB	$(1.055)^{-17}(12)(328)(10.49)$	$(1.055)^{-27}(12)(254)(10.49)$	
	= 16,616	= 7,533	24,150

Initial Reversion = 15,850 = 40,000 – 24,150
25% asset transfer = 3,960 = 25%(15,840)

The asset transfer of 8,000 exceeds the 25%, so the excise tax will be 20% of the final reversion.

Actual Reversion = 7,850 = 40,000 – 24,150 – 8,000 asset transfer
Tax on reversion = 1,570 = 20%(7,850)

Answer is A

NOTE:

One minor trick to this problem is that the employer does not have to set up a new plan as the qualified replacement plan. The heading of IRC 4975(d) says

“(d) Increase in tax for failure to **establish** replacement plan or increase benefits”

But the text of IRC 4975(d)(1)(A) says

“(A) the employer **establishes or maintains** a qualified replacement plan, or”

2007 EA-2B Exam Solutions

Problem 27 - Page 1

Under the Rolling Five Method, the calculation of withdrawal liability is relatively simple. Since the withdrawal occurred in 2007, you should use the UVB at 12/31/2006. Employer A's share of the 12/31/2006 UVB is based on the ratio of employer A's contributions to the total contributions in the prior five years.

YEAR:	2002	2003	2004	2005	2006
ER share = 6,150,000 * (15,120 +	7,260 +	7,200 +	6,800 +	6,930)
	(507,600 +	475,200 +	459,000 +	510,000 +	480,150
ER share = 6,150,000 *	$\frac{43,310}{2,431,950}$				
	= 109,524				

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

The mandatory de minimis is the lesser of 50,000 or 3/4% of the plan's total UVB (.0075 * 6,150,000 = 46,125). The deductible is the de minimis amount reduced by the excess of the allocated UVB over 100,000. The deductible is 46,125 less (109,524 - 100,000), or 36,601. The final employer withdrawal liability is 109,524 - 36,601 = 72,923.

One key to this problem is knowing the definition of the annual withdrawal liability payment. The annual payment amount is the product of (1) and (2):

- (1) Highest contribution rate in the 10 years including year of withdrawal
- (2) Highest consecutive 3 year average of hours in the 10 years excluding year of withdrawal

In this problem, the withdrawal year is 2007. The highest contribution rate in the 10 years from 1998 through 2007 is .37.

The highest consecutive 3 year average of hours in the 10 years from 1997 through 2006 is calculated using the years 1999 through 2001:

$$55,000 = (1/3)[50,000 + 60,000 + 55,000]$$

The annual payment amount is $20,350 = .37 * 55,000$.

2007 EA-2B Exam Solutions

Problem 27 - Page 2

The second key point is knowing how to use the withdrawal liability payments to write down the withdrawal liability. The actual payments are made quarterly. The quarterly payment amount is $\frac{1}{4}$ of the annual payment amount. The first quarterly payment is made at the start of the plan year following the year of withdrawal.

You are told that the valuation interest rate is 8%. Based on the technique shown in the old Multiemployer study note (no longer on the recommended reading list for the exam), the withdrawal liability should be increased with 8% interest during the year of withdrawal. It takes slightly more than 4 years to write off the withdrawal liability:

Date	W/D liability	01/01 Payment	Liability after Payment
01/01/08	78,757	20,350	58,407
01/01/09	63,079	20,350	42,729
01/01/10	46,148	20,350	25,798
01/01/11	27,862	20,350	7,512
01/01/12	8,112	8,112	0
Total		89,512	

The total payments are 89,512.

Answer is D

There is just one problem with this approach. D is NOT the correct answer range for this problem! There was a Supreme Court case in 1995 that ruled the withdrawal liability should NOT be increased with interest during the year of withdrawal. Here is the “official” solution to the problem using that approach:

Date	W/D liability	01/01 Payment	Liability after Payment
01/01/08	72,923	20,350	52,573
01/01/09	56,779	20,350	36,429
01/01/10	39,343	20,350	18,993
01/01/11	20,513	20,350	163
01/01/12	176	176	0
Total		81,576	

The total payments are 81,576.

Answer is C

NOTE

Credit was given for both answers on this exam question.

2007 EA-2B Exam Solutions

Problem 28

Similar to 2002 #26

This is the “simple version” of a multiemployer PBGC guaranteed benefits question. In general, benefit increases within the 60 months preceding the date of plan termination (DOPT) are not guaranteed.

This problem does not state the DOPT, but asks for the guaranteed benefits at 01/01/2007. You should ignore all plan changes subsequent to 01/01/2002. One minor point of the problem is that you should ignore the amendment that was adopted 01/01/2002. The reason is that the PBGC uses the later of the adoption date and the amendment date. Since the amendment was adopted 01/01/2003, it falls within 5 years of 01/01/2007.

In PBGC Technical Update 00-7, it states that the guarantee for multiemployer plans is \$11 per month of benefit accrual plus 75% of the next \$33 per month of benefit accrual.

Guaranteed benefit accrual rate:
 $11.00 + 75\%(30 - 11.00) = 25.25$ per month

Participant count	Past Service	Monthly Guaranteed benefit
10	30	$7,575 = 10(30)(25.25)$
40	10	$10,100 = 40(10)(25.25)$

Total monthly guaranteed benefit:
 $17,675 = 7,575 + 10,100$

Answer is B

NOTE

The key point of problem 2002-26 was how you interpret that guarantee based on varying rates of benefit accrual over time. At ERISA Section 4022A(c)(2), it defines the accrual rate as the participant's monthly accrued benefit divided by benefit accrual service. This 2002 problem was the only time this concept has been tested on the enrollment exams.

2007 EA-2B Exam Solutions

Problem 29 – Page 1

Similar to 2006 #28

WARNING

Solutions to the 2007 EA-2B exam questions on IRC Section 415 were based on the law in effect at 12/31/06. This solution does not reflect the final 415 regulation, which became effective in April of 2007.
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WARNING

This is a typical §415 problem. The key point of the problem is the calculation of the actuarial reduction to the §415 dollar limit prior to age 62.

Starting in 1997, earnings under §415 is defined as total compensation (not taxable). Earnings under §415 is not subject to the §401(a)(17) limit.

At 12/31/07

Age	55
Service	9 years
Benefit Service	8 years
Participation	3 years

PLAN BENEFIT

One trick to the problem is that the plan grants no more than 5 years of pre-participation service. That is why the benefit service is only 8 years. The problem asks for the participant's accrued benefit at 12/31/07, which is based on the normal retirement age of 60.

$$\text{Accrued benefit at NRA 60} = 50,000(11.5\%)(8) = 46,000$$

415 COMP LIMIT

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

$$\begin{aligned}\text{\$415 compensation limit} &= 50,000 * (9/10) \\ &= 45,000\end{aligned}$$

415 DOLLAR LIMIT

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

$$\begin{aligned}\text{\$415 dollar limit during 2007} &= 180,000 \text{ at age 62} * (3/10) \\ &= 54,000\end{aligned}$$

§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 98-1 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.

2007 EA-2B Exam Solutions

Problem 29 - Page 2

In this problem, you are given the factors for $\ddot{a}_{60}^{(12)}$ and $\ddot{a}_{62}^{(12)}$ on several bases. You are not given any factors for the probability of survival. This is consistent with the definition of the death benefit under the plan.

With a death benefit that is equal to 100% of the present value of the accrued benefit, there is no risk of forfeiting the benefit. Since there is no mortality risk involved, the actuarial reduction prior to age 62 is calculated using the ratio of the annuity values, discounted with interest.

$$\text{Actuarial reduction from 62 to 60} = v^2(\ddot{a}_{62}^{(12)} / \ddot{a}_{60}^{(12)})$$

$$\begin{aligned} \text{Actuarial reduction from 62 to 60} \\ \text{(Mandated basis 5\% app. mortality)} &= (1.05)^{-2}(12.68/13.25) \\ &= .8680 \end{aligned}$$

$$\begin{aligned} \text{Actuarial reduction from 62 to 60} \\ \text{(Plan basis 5\% 1983-GAM mortality)} &= (1.05)^{-2}(13.44/13.98) \\ &= .8720 \end{aligned}$$

$$\begin{aligned} \$415 \text{ dollar limit at age 60} &= 54,000 * \text{lesser of } [.8680 \text{ or } .8720] \\ &= 46,873 \end{aligned}$$

The 415 limit on a life annuity basis is the lesser of the compensation limit of 45,000 and the dollar limit of 46,873. On a monthly basis, the accrued benefit is limited to $45,000/12 = 3,750$.

Answer is B

NOTE

This seems too short for a 5 point problem.

2007 EA-2B Exam Solutions

Problem 30 - Page 1

Similar to 2004 #33

Revised 04/22/08

This is a fairly long problem on calculations involving imputed permitted disparity and the rate group ratio percentage test under 401(a)(4). The questions on imputed permitted disparity for DC plans are a bit less complicated than those on DB plans.

One key point of the problem is knowing the definition of a rate group. It consists of all employees with both a normal accrual rate (NAR) and a most valuable accrual rate (MVAR) greater than or equal to those rates for a given HCE. Since this is a DC plan, the MVAR is by definition identical to the NAR.

Another point is knowing the definition for the ratio percentage test for a rate group. The general test for a defined benefit plan is described at 1.401(a)(4)-3(c). The regulation states that the general test is satisfied if each rate group satisfies 410(b). It then points to 1.401(a)(4)-2(c)(3) to define how a rate group satisfies 410(b).

1.401(a)(4)-2(c)(3)(i) states that a rate group must be treated as a separate plan. The numerator of the ratio percentage includes employees in the rate group. The denominator must include all non-excludable employees, even if they are not benefiting under the plan:

$$\text{Ratio \% test: } \left(\frac{\text{NHCEs in Rate Group}}{\text{Total Non-excludable NHCEs}} \right) \left(\frac{\text{HCEs in Rate Group}}{\text{Total Non-excludable HCEs}} \right)$$

You are given data for all 14 employees of the employer. Based on the data given, none of the employees are excludable. There are several items to consider regarding imputed permitted disparity:

- You can't impute permitted disparity on any 401(k) deferrals (for cross-tested plans)
- There are two different calculations that vary based on compensation level

There are different calculations for the imputed permitted disparity based on whether the plan year compensation exceeds the taxable wage base. The tables given with the exam show the 2006 taxable wage base as 94,200.

For employees with plan year compensation above the taxable wage base, you must calculate the "C rate" and the "D rate", and use the lesser of the rates. These are defined at 1.401(a)(4)-7(c)(3) as:

C Rate	D Rate
ER allocation	ER allocation + 5.7%*(taxable wage base)
Plan year comp – ½ (taxable wage base)	Plan year compensation

Problem 30 - Page 2**Revised 04/25/09**

The first step is to determine the adjusted allocation rate for the HCEs. This is the same as the normal allocation rate (NAR) that will be used to define the rate group for HCE4. Then you do similar calculations for each of the NHCEs. Once you have all the adjusted allocation rates, you can do the ratio percentage test calculations.

If you look carefully at the data, you only need to do calculations for HCE4. All of the HCEs have the same compensation. Since HCEs 1 through 3 have higher allocation amounts than HCE4, they will all be in the rate group for HCE4.

HCE4

The NAR adjusted for imputed permitted disparity is 2.27%, the lesser of the C rate and the D rate:

$$\begin{array}{lcl} \text{C rate} & = & 2.27\% = 1,200 / 52,900 \\ \text{D rate} & = & 6.57\% = 1.20\% + 5.37\% \end{array}$$

The rate group for HCE4 consists of all employees with a NAR of 2.27% or higher. All of the HCEs are in the rate group. Now you need to do calculations of the NAR for the NHCEs.

For employees with plan year compensation \leq the taxable wage base, you must calculate the “A rate” and the “B rate”, and use the lesser of the rates. The unadjusted allocation rate is the value given in the data for the problem. It is the NAR without imputing permitted disparity.

A Rate

$$2 * \text{unadjusted allocation rate}$$

B Rate

$$\text{unadjusted allocation rate} + \text{permitted disparity rate}$$

Since the permitted disparity rate is 5.7%, the A rate will be lower than the B rate for all employees whose allocation rate is less than 5.7%. This is true for all the NHCEs

NHCE	Allocation rate	A Rate
1	5.0%	10.0%
2	4.0%	8.0%
3	3.5%	7.0%
4	3.2%	6.4%
5	3.0%	6.0%
6	2.5%	5.0%
7	1.12%	2.24%

2007 EA-2B Exam Solutions

Problem 30 - Page 3

You don't need to do any calculations for the other three NHCEs, since their allocation rates are even lower. Only NHCEs 1 through 6 are in the rate group for HCE4.

Now you can calculate the ratio percentage test result for the rate group:

$$\text{Ratio \% test: } \left(\frac{\text{NHCEs in Rate Group}}{\text{Total Non-excludable NHCEs}} \right) \left(\frac{\text{HCEs in Rate Group}}{\text{Total Non-excludable HCEs}} \right)$$

$$\begin{aligned} \text{Ratio\%} &= (6/10)/(4/4) \\ &= 60\% \end{aligned}$$

Answer is B

2007 EA-2B Exam Solutions

Problem 31 - Page 1

Similar to 2001 #23

Revised 04/22/08

§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.

In prior problems, they asked for the change in the vested accrued benefit from one valuation date to the next. This is an easier problem, since they only ask for the employer provided benefit.

You need to determine the age, service, vesting percentage and total accrued benefit at 01/01/2006. The benefit accrues at 1.6% of pay for each year of service. Since the pay does not change, this is an easy calculation:

As of 01/01/2006

Age	53
Service	5
Vesting %	60%
Accrued benefit	$4,000 = 50,000 * 5 * 1.6\%$

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

Year	Pay	12/31			EECWI Calculation
		contrib	120% AFR	12/31 EECWI	
2001	50,000	3,000	0	3,000.00	
2002	50,000	3,000	5.40%	6,162.00	$= 1.0540 * 3,000.00 + 3,000$
2003	50,000	3,000	4.12%	9,415.87	$= 1.0412 * 6,162.00 + 3,000$
2004	50,000	3,000	4.23%	12,814.17	$= 1.0423 * 9,415.87 + 3,000$
2005	50,000	3,000	4.53%	16,394.65	$= 1.0453 * 12,814.17 + 3,000$

Smith is age 53 at 01/01/06, and you have to convert the contribution balance to a benefit at normal retirement age, which is 12 years later. The EECWI at 01/01/06 is accumulated with interest at the §417(e) rate until normal retirement age 65.

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. The employee provided benefit equals the accrued benefit less the employee provided benefit.

2007 EA-2B Exam Solutions

Problem 31 - Page 2

The question asks for the employer-derived deferred annuity payable at age 65. The employee provided portion is always 100% vested, and the remaining accrued benefit is subject to the plan's vesting schedule. Here are the details of the calculations:

	01/01/2006
417(e)(3) rate	4.65%
EECWI at 65	28,286
Annuity at NRA	12.15
EE provided benefit	2,328
Plan accrued benefit	4,000
Final accrued benefit	4,000
ER provided benefit	1,672
Vesting percentage	60%
Vested ER provided benefit	1,003

The final accrued benefit is defined as the greater of the employee provided benefit and the plan formula accrued benefit. The employer provided deferred annuity is the vested portion of 1,003.

Answer is C

NOTES:

1. I was surprised to see how wide the answer ranges are for this problem. If you completely forget to allow for the vesting percentage, you still end up in answer range C.
2. You should review problem 23 on the 2005 exam. It was a bit trickier than this problem.

2007 EA-2B Exam Solutions

Problem 32 - Page 1

Similar to 2006 #25

Revised 03/08/12

Most PBGC problems are strictly concerned with benefits in priority categories for asset allocation purposes, or with the definition of guaranteed benefits. In this problem, the participant has benefits in both Priority Category 3 and in Priority Category 4, which is unusual for exam questions.

Priority Category 4 is defined based on the five year phase-in for non-owners. After you subtract the benefit in Priority Category 3, you will have the remaining benefit allocated to Priority Category 4.

The first part of the problem is calculation of the Priority Category 3 (PC3) benefit. The plan termination date (DOPT) is 12/31/06. Participants in PC3 are those who were (or could have been) in pay status at DOPT-3, or 12/31/03. The early retirement eligibility that is used is based on the plan provisions in effect at DOPT-3.

Priority Category 3 benefits are the lowest amount payable in the three years preceding DOPT, determined based on lowest level of plan benefits in effect for the five years preceding DOPT. There are no maximum benefit limits on PC3 benefits. For participants who were not in pay status at DOPT-3, the PC3 benefit is calculated as if they retired at DOPT-3:

	Smith: PC3 benefit
Date of birth	12/31/46
Date of hire	12/31/86
12/31/03 age	57
12/31/03 service	17
12/31/03 final average compensation	65,000 (given)
12/31/03 plan Early retirement factor	76% = $1 - 3\%(65-57)$
12/31/01 plan accrual rate	2.25%
12/31/01 plan accrued benefit at 12/31/03	24,862.50 = $(17)(2.25\%)(65,000)$
12/31/01 plan retirement benefit at 12/31/03	1,574.63 = $76\%(24,862.50)/12$

This problem also tests your knowledge of the five year phase-in calculation. 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 that are subject to the phase in rules.

If there were 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.

2007 EA-2B Exam Solutions

Problem 32 - Page 2

Revised 03/20/09

The change in plan benefits at 07/01/04 is subject to phase-ins at the DOPT of 12/31/06. You should 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. The MGB should be adjusted based on a benefit commencement age at DOPT different from age 65. Here it is adjusted to the early retirement age of 60.

One minor trick to the problem is that the termination date is 12/31/06 (not 2007). You should use the 2006 MGB at 65, which equals 3,971.59 per month. The reduction factor for age 60 is .65, which produces 2,581.53. The calculation of the guaranteed benefit for the five year phase-in also assumes the benefit commencement age is 60. This is based on some tricky wording in the question, which asks for "Smith's immediate monthly benefit".

Smith: PC3+PC4 benefit - 5 year phase-ins	
Date of birth	12/31/46
12/31/06 age	60
Date of hire	12/31/86
12/31/06 service	20
12/31/06 final average compensation	80,000 (given)
Vesting percentage	100% (any vesting schedule)
Pre-2004 plan ERF, age 60	85% = $1 - 3\%(65-60)$
Pre-2004 plan vested accrued benefit, retirement at 60	$2,550.00 = (85\%)(20)(2.25\%)(80,000) / 12$
Full years plan has been in effect	5
Phase-in	2,550.00
07/01/04 plan ERF, age 60	85% = $1 - 3\%(65-60)$
07/01/04 plan vested accrued benefit, retirement at 60	$2,833.33 = (85\%)(20)(2.5\%)(80,000) / 12$ 2,581.53 (MGB applies)
Guaranteeable benefit increase	$31.53 = 2,581.53 - 2,550.00$
Full years plan has been in effect	2
2 year phase-in	$40\%(31.53)$ or 40/mo. $= 31.53$ (can't exceed total GBI)
Total PC3+PC4 benefit	$2,581.53 = 2,550.00 + 31.53$

The monthly benefit assigned to PC4 equals 2,581.53 minus the PC3 benefit of 1,574.63, or 1,006.91.

Answer is D

(See next page for notes)

Problem 32 – Page 3

Notes re: Guaranteed benefit calculations

1. The MGB does not increase beyond the year of plan termination. See Example 13 in Appendix A of the PBGC study note.
2. You should use the later 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 later 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.
5. 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.
6. In some problems, plan changes have different effective dates and adoption dates. For purposes of measuring the years that each plan was effective, you use the later of the effective date and the adoption date.

2007 EA-2B Exam Solutions

Problem 33 – Page 1

Revised 04/21/09

1.410(b)-4(c)(4) defines the Safe and Unsafe harbor percentages based on the non-highly compensated concentration percentage (NHCCP). The NHCCP is defined under the regulations at §1.410(b)-4(c)(4)(iii) as the ratio of non-excludable NHCEs to total non-excludable employees.

The regulation defines the NHCCP as "for all employees of the employer." For the NHCCP, the regulation states that the excludable employees are the same as under the ABPT, which uses "all plans in the testing group."

Since the plans are aggregated, the only excludable employees would be those who don't meet either plan's eligibility requirements. Since Plan A has no minimum age or service requirement, no employees are excludable.

One area of confusion is that both plans cover "union employees". Based on the conditions for the exam, you should assume that "union employees" are covered under a collective bargaining agreement (CBA).

In 1.410(b)-6(d), it discusses treatment of CBA employees. If the CBA employees do not benefit under the plan, they should be treated as excludable. The rules in 1.410(b)-6(d) specify that collectively bargained employees who are benefiting should be disaggregated, and tested as a separate plan.

Based on the data given in the problem, the plan benefits both union employees and non-union employees. You should ignore the union (collectively bargained) employees in calculating the NHCCP:

	Plan A	Plan B	
	Division A	Division B	Total
HCEs Non-union	250	151	401
NHCEs Non-union	2,100	675	2,775

$$\begin{aligned}\text{Total NHCCP} &= [2,775 / (2,775+401)] \\ &= 87.37\%\end{aligned}$$

Based on the table values shown in the regulations, the NHCCP should be truncated to 87%.

Answer is E

(see note on next page)

NOTE

It is surprising that you can get the same value for the NHCCP if you include the union employees in the calculation. This is possible because the union employees are a fairly small percentage of the total NHCEs.

	Plan A	Plan B	
	Division A	Division B	Total
HCEs Non-excludable	250	151	401
NHCEs Non-excludable	2,200	710	2,910

$$\begin{aligned}\text{Total NHCCP} &= [2,910 / (2,910+401)] \\ &= 87.89\%\end{aligned}$$

Based on the table values shown in the regulations, the NHCCP should be truncated to 87%.

Answer is E

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2007 EA-2B Exam Solutions

Problem 34 - Page 1

Similar to 2006 #38

§4980(a) of the Internal Revenue Code states that the excise tax upon reversion is 20%.

§4980(d) states that the excise tax increases to 50% unless either

- The employer establishes a “qualified replacement plan”, or
- The employer grants certain benefit increases prior to plan termination.

The general definition of a qualified replacement plan includes 95% participation by continuing employees from the terminating plan, plus an asset transfer of at least 25% of the excess assets. You can reduce the 25% asset transfer by the value of benefit improvements made within 60 days of the plan termination.

Instead of establishing a “qualified replacement plan”, the plan can grant benefit increases at plan termination. The benefit improvements must meet two criteria:

- Present value \geq 20% of the reversion (prior to the benefit changes)
- Uniform for all participants

In this problem, the employer has elected not to establish a qualified replacement plan. Instead, the employer will increase benefits at plan termination. The amount of the taxable reversion to the employer will be reduced by the value of the benefit improvements.

Calculate the initial reversion amount as the difference between the market value of assets and the plan termination liability:

Plan term liability	=	790,000	=	300,000 + 80,000 + 10,000 + 400,000
Initial Reversion	=	510,000	=	1,300,000 – 790,000
20% of reversion	=	102,000	=	20%(510,000)

The present value of the benefit improvements must be at least 102,000. This would be an increase of 12.91% ($=102,000/790,000$) for everyone in the plan.

But there are two tricks to this problem. You can't simply give everyone the same pro-rata increase. Smith has a lump sum that is fairly close to the maximum allowed under IRC Section 415. An increase of 13% would force their lump sum at termination to exceed the 415 limit.

In addition, Green is a non-active participant. IRC 4980(d)(3) says the increases to non-active participants can not exceed 40% times [20% of the reversion (prior to the benefit changes)], which is $40,800 = 40\%(20\%(510,000))$. Green's increase in benefits at termination must be 40,800, which is less than the pro-rata increase of $51,646 = 12.91\%(400,000)$.

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Problem 34 - Page 2

Revised 03/20/09

Based on IRC 4980(d)(5)(C), it appears that the difference between 51,646 and 40,800 is simply re-allocated to the remaining participants. The reversion to the employer is unaffected by this provision.

Now you should allow for the 12.91% increase for Jones and Brown. But the increases for Smith and Green must be limited. This is a messy calculation!

Name	Original Lump Sum	112.91% *L.S.	Limited Lump Sum	Excess Lump Sum	Reallocated Excess	Final Lump Sum
Smith	300,000	338,734	325,000	13,734	0	325,000
Jones	80,000	90,329	90,329	0	24,580*8/9	112,178
Brown	10,000	11,291	11,291	0	24,580*1/9	14,022
Green	400,000	451,646	440,800	10,846	0	440,800
Total	790,000	892,000	867,420	24,580	24,580	892,000

The allocation of the excess lump sum is based on the original lump sum values for Jones and Brown. Jones' share is $80/(80+10)$ and Brown's share is $10/(80+10)$.

The difference in the lump sum for Jones is $32,178 = 112,178 - 80,000$.

Answer is D

NOTE

There is one more potential wrinkle to this solution. IRC 4980(d)(3)(A) states that an amendment at plan termination should result in pro-rata increases in the accrued benefit of all "qualified participants." IRC 4980(d)(5)(A) defines the term "qualified participant."

Subsection (iii) states that terminated vested employees are not considered qualified participants unless their service "terminated during the period beginning 3 years before the termination date and ending with the date on which the final distribution of assets occurs."

This problem did not give the date of Green's termination from service. It is unclear if Green should be included in the calculations. In the absence of any additional information, I assumed that Green is included.

2007 EA-2B Exam Solutions

Problem 35

Similar to 2003 #18

Code section 401(a)(26) contains additional participation requirements beyond those in 410(b). 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 a floor to the 40%, which is 2 employees - unless there is only one employee, in which case the one employee must be covered.

The key point of this problem is that 1.401(a)(26)-6 allows you to ignore various excludable employees. These include employees who do not satisfy the plan's minimum age and service requirements for eligibility, as well as most other definitions of excludable employees in the 1.410(b) regulation.

The question asks how many employees need to benefit under Plan B to satisfy 401(a)(26). You can use plan B's eligibility requirement of 2 years of service to identify the excludable employees:

Location	A	B	Total
Service ≥ 2	60	40	100

40% of the 100 employees gives 40 employees who must benefit under Plan B.

Answer is C

NOTES:

1. Based on the number of employees at location B, it appears that Plan B satisfies 401(a)(26) for the 2007 plan year.
2. What if the question had asked about the number of employees that need to benefit under Plan A? You would use plan A's immediate eligibility requirement to identify the excludable employees:

Location	A	B	Total
Service ≥ 0	80	55	135

40% of the 135 employees gives 54 employees who must benefit under Plan A. Based on the number of employees at location A, it appears that Plan A satisfies 401(a)(26) for the 2007 plan year.

2007 EA-2B Exam Solutions

Problem 36

This question tests your knowledge of the requirements of the Internal Revenue Code and ERISA regarding prohibited transactions. Many similar items have appeared in True/False questions on prior exams.

I. TRUE

This is a quote from IRC 4975(a):

“(a) Initial taxes on disqualified person

There is hereby imposed a tax on each prohibited transaction. The rate of tax shall be equal to 15 percent of the amount involved with respect to the prohibited transaction for each year (or part thereof) in the taxable period. The tax imposed by this subsection shall be paid by any disqualified person who participates in the prohibited transaction (other than a fiduciary acting only as such).”

II. FALSE

The 10% limitation in ERISA section 407(a) applies to qualified employer securities and qualified employer real property. There is no prohibited transaction, as long as the investment does not exceed 10% at the time of acquisition of the security.

III. FALSE

There is an exemption for most loans in IRC 4975(d)(1).

IV. FALSE

As shown above, the excise tax is defined as 15% in IRC 4975(a).

Only item I is True.

Answer is A

2007 EA-2B Exam Solutions

Problem 37

This question tests your knowledge of the IRC Section 415 limits. The example given in this problem has been simplified quite a bit.

At 01/01/07, the participant is age 62, with 8 years of service and 1 year of participation service. The key point of the problem is that the participant is eligible for the 10,000 floor.

This is based on exam condition 30:

“The employer has never maintained a defined contribution plan or another defined benefit plan. No employee has been covered by a defined contribution or defined benefit plan that is required to be aggregated with his employer’s plans for purposes of IRC section 415.”

Just to be extra sure, they also stated this in the data for the problem.

I. FALSE

The value of 6,400 is equal to the 100% of 3 year compensation limit under 415. This value has to be reduced, since the participant has less than 10 years of service:

$$6,400 = (8/10) * 8,000$$

But the participant is eligible for the 10,000 floor, which is also reduced based on service:

$$8,000 = (8/10) * 10,000$$

II. TRUE

There is no adjustment under 415 if the form of payment is a Qualified J&S annuity.

III. TRUE

Under 415(b)(4)(B), if Smith was a participant in a defined contribution plan maintained by the employer, the 10,000 floor is not available. Under 415(b)(4)(A), the total benefit under all defined benefit plans can’t exceed 10,000. If Smith was a participant in a second defined benefit plan maintained by the employer, the benefit under this plan would be 8,000 reduced by the other plan benefit.

Items II and III are True.

Answer is D

NOTE

The answer sheet lists “ALL” as the correct answer. A possible flaw in the logic for item III is if the participant did not actually accrue any benefit under a second defined benefit plan. Then the benefit under this plan would not be reduced.