

SOCIETY OF ACTUARIES  
AMERICAN SOCIETY OF PENSION ACTUARIES  
JOINT BOARD FOR THE ENROLLMENT OF ACTUARIES

**ENROLLED ACTUARIES PENSION EXAMINATION, SEGMENT A**

**NOVEMBER 2007 EA-2, SEGMENT A, EXAMINATION**

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2007

Data for Question 1 (3 points)

Selected valuation results as of 1/1/2008:

Funding target	\$1,400,000
Target normal cost	25,000
Shortfall amortization charge	45,000
Actuarial (market) value of assets	1,140,000

Amortization factor for the 1/1/2008 shortfall amortization installment: 5.9982.

The employer makes a single contribution of \$X on 1/1/2008 in the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

Question 1

In what range is \$X?

- (A) Less than \$58,500
- (B) \$58,500 but less than \$62,500
- (C) \$62,500 but less than \$66,500
- (D) \$66,500 but less than \$70,500
- (E) \$70,500 or more

2007

Data for Question 2 (4 points)

Credit balance in funding standard account as of 12/31/2007: \$7,550.

Selected information for the 2008 plan year:

Funding target	\$1,100,000
Target normal cost	38,000
Shortfall amortization charge	33,500
Actuarial (market) value of assets	915,000
Effective interest rate	5.80%

The employer makes a single contribution of \$X on 9/15/2009 in the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

Question 2

In what range is \$X?

- (A) Less than \$70,000
- (B) \$70,000 but less than \$72,000
- (C) \$72,000 but less than \$74,000
- (D) \$74,000 but less than \$76,000
- (E) \$76,000 or more

2007

Data for Question 3 (4 points)

Credit balance in the funding standard account as of 12/31/2007: \$0.

Selected valuation results as of 1/1/2008:

Funding target	\$1,000,000
Funding target reflecting expected future compensation increases	1,200,000
Target normal cost	80,000
At-risk funding target for IRC section 404 purposes	1,500,000
At-risk target normal cost for IRC section 404 purposes	80,000
Actuarial (market) value of assets	915,000
Effective interest rate	5.00%

The plan has always had over 500 participants.

Question 3

In what range is the deductible limit for 2008?

- (A) Less than \$750,000
- (B) \$750,000 but less than \$850,000
- (C) \$850,000 but less than \$950,000
- (D) \$950,000 but less than \$1,050,000
- (E) \$1,050,000 or more

2007

Data for Question 4 (5 points)

Valuation date: 1/1/2008.

Normal retirement benefit: \$2,000 per year for each year of service.

Early retirement eligibility: Age 55 with 25 years of service.

Early retirement benefit: Accrued benefit payable immediately.

Valuation interest rates:

Segment rates (5%, 6%, 7%)

No pre-retirement mortality or withdrawal is assumed.

Data for participant Smith:

Date of birth 1/1/1963

Date of hire 1/1/1993

Selected commutation functions:

<u>Age</u>	<u>Segment 1 rate</u>		<u>Segment 2 rate</u>		<u>Segment 3 rate</u>	
	<u><math>N_x</math></u>	<u><math>D_x</math></u>	<u><math>N_x</math></u>	<u><math>D_x</math></u>	<u><math>N_x</math></u>	<u><math>D_x</math></u>
55	659,904	48,207	601,124	44,586	514,881	42,007
65	295,095	26,298	265,833	23,980	223,488	20,568

The plan is in at-risk status for the 2008 plan year.

Question 4

In what range is the at-risk funding target with respect to Smith prior to the loading factor as of 1/1/2008?

- (A) Less than \$195,000
- (B) \$195,000 but less than \$210,000
- (C) \$210,000 but less than \$225,000
- (D) \$225,000 but less than \$240,000
- (E) \$240,000 or more

2007

Data for Question 5 (2 points)

Credit balance in the funding standard account as of 12/31/2007: \$0.

Selected valuation results as of 1/1/2008:

Funding target without regard to at-risk assumptions	\$12,000,000
At-risk funding target	12,400,000
Actuarial (market) value of assets	6,000,000

The plan is in at-risk status for the 2008 plan year.

Question 5

In what range is the shortfall amortization base as of 1/1/2008?

- (A) Less than \$6,050,000
- (B) \$6,050,000 but less than \$6,150,000
- (C) \$6,150,000 but less than \$6,250,000
- (D) \$6,250,000 but less than \$6,350,000
- (E) \$6,350,000 or more

2007

Data for Question 6 (4 points)

Credit balance in the funding standard account as of 12/31/2007: \$1,224,500.

Selected valuation results as of 1/1/2008:

Funding target	\$12,000,000
Target normal cost	800,000
Actuarial (market) value of assets	11,000,000
Effective interest rate	5.70%

Amortization factor for the 1/1/2008 shortfall amortization installment: 5.9982.

Actual rate of return on plan assets during 2008: 4.89%.

Contribution for the 2008 plan year made on 12/31/2008: \$10,000.

The plan sponsor elects to apply the minimum amount of the funding standard carryover balance necessary to meet the minimum funding standard.

Question 6

In what range is the maximum possible funding standard carryover balance as of 1/1/2009?

- (A) Less than \$56,250
- (B) \$56,250 but less than \$61,250
- (C) \$61,250 but less than \$66,250
- (D) \$66,250 but less than \$71,250
- (E) \$71,250 or more



2007

Data for Question 7 (2 points)

Normal retirement benefit: 10% of final 3-year average salary for each year of service up to 10 years of service.

Data for participant Smith:

Date of birth     1/1/1953  
Date of hire     1/1/2004

Salary history:

2008	\$280,000
2007	250,000
2006	170,000

Assumed 2008 IRC limits:

Section 401(a)(17) compensation limitation	\$230,000
Section 415(b) dollar limitation	185,000

Question 7

In what range is Smith's accrued benefit as of 12/31/2008?

- (A) Less than \$90,000
- (B) \$90,000 but less than \$100,000
- (C) \$100,000 but less than \$110,000
- (D) \$110,000 but less than \$120,000
- (E) \$120,000 or more

2007

Data for Question 8 (3 points)

Credit balance in the funding standard account as of 12/31/2007: \$0.

2008 segment rates: (5%, 5%, 6%).

2009 segment rates: (6%, 6%, 7%).

Selected valuation result as of 1/1/2008:

Shortfall amortization charge	\$185,000
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Selected valuation results as of 1/1/2009:

Funding target	\$11,000,000
Actuarial (market) value of assets	10,500,000

The contribution for the 2008 plan year was equal to the smallest amount that satisfies the minimum funding standard for the 2008 plan year.

Question 8

In what range is the total shortfall amortization charge as of 1/1/2009?

- (A) Less than \$100,000
- (B) \$100,000 but less than \$104,000
- (C) \$104,000 but less than \$108,000
- (D) \$108,000 but less than \$112,000
- (E) \$112,000 or more

2007

Data for Question 9 (4 points)

Type of plan: Multiemployer plan.

Valuation interest rate: 7% per year.

Selected valuation results:	<u>1/1/2007</u>	<u>1/1/2008</u>
Accrued liability	\$550,000	\$700,000
Normal cost	100,000	110,000
Actuarial (market) value of assets	500,000	575,000

Benefit payments made on 7/1/2007: \$35,000.

Contribution for the 2007 plan year made on 9/1/2007: \$100,000.

The 1/1/2007 and 1/1/2008 valuation results were both prepared using the same actuarial assumptions and methods.

X = the ratio of the investment loss to the total actuarial loss during 2007.

Question 9

In what range is X?

- (A) Less than 34%
- (B) 34% but less than 36%
- (C) 36% but less than 38%
- (D) 38% but less than 40%
- (E) 40% or more

Data for Question 10 (3 points)

Normal retirement eligibility: Age 62.

Early retirement eligibility: Age 60.

Early retirement benefit: \$9,250 per month reduced by 4.55% per year by which the benefit commencement date precedes age 62.

Form of benefit: Single life annuity.

Data for participant Smith:

Date of birth	1/1/1948
Date of hire	1/1/2001
Date of participation	1/1/2002
Date of retirement	1/1/2008
Annual salary since 1/1/2001	\$150,000

The following factors are based on IRC section 417(e) applicable mortality and 5% interest:

Age	$\ddot{a}_x^{(12)}$
60	13.25082
62	12.67978

Assumed IRC section 415(b) dollar limit for 2008: \$185,000.

There is no forfeiture of benefits upon pre-retirement death.

Question 10

In what range is the maximum annual benefit Smith can receive?

- (A) Less than \$90,500
- (B) \$90,500 but less than \$96,500
- (C) \$96,500 but less than \$102,500
- (D) \$102,500 but less than \$108,500
- (E) \$108,500 or more

2007

Data for Question 11 (3 points)

Type of plan: Multiemployer plan.

Actuarial value of assets:

Prior to 2008 Smoothed market value (without phase-in) as defined in Rev. Proc. 2000-40 (smoothing differences between expected and actual market value of assets), with a 5-year smoothing period.

After 2007 Smoothed market value (without phase-in) as defined in Rev. Proc. 2000-40 (smoothing differences between expected and actual market value of assets), with a 2-year smoothing period.

Market value of assets as of 1/1/2008: \$5,000,000.

Historical market value asset (gains) and losses:

<u>Year</u>	<u>(Gain)/Loss</u>
2007	(\$200,000)
2006	50,000
2005	200,000
2004	50,000
2003	(500,000)

Question 11

In what range is the absolute value of the change in the actuarial value of assets due to the method change?

- (A) Less than \$25,000
- (B) \$25,000 but less than \$45,000
- (C) \$45,000 but less than \$65,000
- (D) \$65,000 but less than \$85,000
- (E) \$85,000 or more

Data for Question 12 (1 point)

For the 2008 plan year, the actuarial valuation date for all single-employer plans must be the first day of the plan year.

Question 12

Is the above statement true or false?

(A) True

(B) False

2007

Data for Question 13 (4 points)

An additional funding charge was required for the 2007 plan year.

Credit balance in the funding standard account as of 12/31/2007: \$500,000.

Selected valuation results as of 1/1/2008:

Funding target	\$10,000,000
Target normal cost	2,000,000
Actuarial (market) value of assets	9,800,000

Amortization factor for the 1/1/2008 shortfall amortization installment: 5.9982.

The plan has always had more than 100 participants.

The employer makes a single contribution of \$X on 1/1/2008 in the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

Question 13

In what range is \$X?

- (A) Less than \$1,500,000
- (B) \$1,500,000 but less than \$1,600,000
- (C) \$1,600,000 but less than \$1,700,000
- (D) \$1,700,000 but less than \$1,800,000
- (E) \$1,800,000 or more

Data for Question 14 (5 points)

Type of plan: Multiemployer plan.

Plan effective date: 1/1/1995.

Average salary: Highest 3-year average salary out of the last five years.

Normal retirement benefit: 1% of average salary for each year of service.

Early retirement benefit: Normal retirement benefit reduced by 4% per year for the first 4 years and 6% per year for the next 6 years by which the benefit commencement date precedes age 65.

Actuarial cost method: Projected unit credit.

Selected actuarial assumptions:

Valuation interest rate	7% per year
Salary increases	3% per year
Retirement age	61

Data for participant Smith:

		<u>Salary history</u>	
Date of birth	1/1/1949	2007	\$63,000
Date of hire	1/1/1991	2006	62,000
Date of retirement	1/1/2008	2005	60,000
		2004	50,000
		2003	51,000

Selected annuity values:

$$\ddot{a}_{59}^{(12)} = 11.26 \quad \ddot{a}_{61}^{(12)} = 10.88$$

Question 14

In what range is the absolute value of the actuarial (gain)/loss as of 1/1/2008 due solely to Smith's retirement?

- (A) Less than \$2,500
- (B) \$2,500 but less than \$7,500
- (C) \$7,500 but less than \$12,500
- (D) \$12,500 but less than \$17,500
- (E) \$17,500 or more



2007

Data for Question 15 (4 points)

Type of plan: Multiemployer plan.

Actuarial cost method: Unit credit.

Valuation interest rate:

Before 2008	7.5% per year
After 2007	7.0% per year

Credit balance in the funding standard account as of 12/31/2007: \$0.

Information for all pre-2008 funding standard account amortization bases as of 1/1/2008:

<u>Nature of base</u>	<u>Outstanding base</u>	<u>Remaining years</u>
Plan amendment	\$377,201	29
Actuarial (gain)/loss	(547,550)	14

Experience loss during 2007: \$100,000.

Increase as of 1/1/2008 due to the change in the valuation interest rate:

Accrued liability	\$190,000
Normal cost	20,000

A single contribution of \$X is to be made on 1/1/2008 in the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

Question 15

In what range is absolute value of the change in \$X due to the change in the valuation interest rate?

- (A) Less than \$34,500
- (B) \$34,500 but less than \$39,500
- (C) \$39,500 but less than \$44,500
- (D) \$44,500 but less than \$49,500
- (E) \$49,500 or more

Data for Question 16 (2 points)

This question consists of an assertion in the left-hand column and a reason in the right-hand column.

ASSERTION

The valuation interest rates used for a multiemployer plan must be the full yield curve or three-segmented yield curve used to determine the minimum required contribution for single employer plans.

REASON

Assumptions for a multiemployer plan must each be reasonable, and in combination, offer the actuary's best estimate of anticipated experience under the plan.

Question 16

Which of the following statements is true regarding the determination of the 2008 minimum required contribution?

- (A) Both the assertion and the reason are true statements and the reason is a correct explanation of the assertion.
- (B) Both the assertion and the reason are true statements and the reason is NOT a correct explanation of the assertion.
- (C) The assertion is a true statement, but the reason is a false statement.
- (D) The assertion is a false statement, but the reason is a true statement.
- (E) Both the assertion and the reason are false statements.

2007

Data for Question 17 (5 points)

Type of plan: Multiemployer plan.

Plan effective date: 1/1/2005.

Actuarial cost method: Frozen initial liability.

Valuation interest rate: 7% per year.

Current liability interest rate: 6% per year.

Credit balance in the funding standard account as of 12/31/2006: \$0.

Selected valuation results as of 1/1/2007:

Normal cost	\$200,000
Unfunded accrued liability	800,000
Market value of assets	450,000
Actuarial value of assets	500,000
Accrued liability under the entry age normal method	1,000,000
Normal cost under the entry age normal method	100,000
Current liability	540,000
Expected increase in current liability	
due to benefits accruing during the plan year	200,000
Expected benefit payments	0

Contribution for 2007 made on 7/1/2007: \$900,000.

Question 17

In what range is the excise tax due to the contribution in excess of the deductible limit for 2007?

- (A) Less than \$25,000
- (B) \$25,000 but less than \$40,000
- (C) \$40,000 but less than \$55,000
- (D) \$55,000 but less than \$70,000
- (E) \$70,000 or more

2007

Data for Question 18 (4 points)

Plan effective date: 1/1/1993.

Normal retirement benefit: 2% of final year salary for each year of service.

Assumptions:

Interest rates	Segment rates (6%, 6%, 7%)
Salary increases	5% per year

Credit balance in the funding standard account as of 12/31/2007: \$5,000.

Actuarial (market) value of assets at 1/1/2008: \$60,000.

Data for sole plan participant:

Date of birth	1/1/1963
Date of hire	1/1/1993
2007 salary	\$100,000

Selected actuarial factors:

Interest Rate	$\ddot{a}_{65}^{(12)}$
6%	9.00
7%	8.00

The employer does not elect to decrease the funding standard carryover balance or apply it against the **minimum required contribution**.

Question 18

In what range is the **minimum required contribution** for the 2008 plan year as of 1/1/2008?

- (A) Less than \$4,600
- (B) \$4,600 but less than \$7,600
- (C) \$7,600 but less than \$10,600
- (D) \$10,600 but less than \$13,600
- (E) \$13,600 or more

2007

Data for Question 19 (5 points)

Normal retirement benefit: 2% of final year salary for each year of service.

Early retirement benefit: None.

Assumptions:

Interest rates	Segment rates (6%, 6%, 7%)
Salary increases	5% per year

Credit balance in the funding standard account as of 12/31/2007: \$1,000.

Actuarial (market) value of assets at 1/1/2008: \$40,000.

Data for sole plan participant:

Date of birth	1/1/1963
Date of hire	1/1/1993
2007 salary	\$60,000

Selected actuarial factors:

Interest Rate	$\ddot{a}_{65}^{(12)}$
6%	9.00
7%	8.00

Question 19

In what range is the deductible limit for the 2008 tax year?

- (A) Less than \$30,000
- (B) \$30,000 but less than \$47,500
- (C) \$47,500 but less than \$65,000
- (D) \$65,000 but less than \$82,500
- (E) \$82,500 or more

2007

Data for Question 20 (4 points)

Normal retirement benefit: 2% of final year salary for each year of service.

Assumptions:

Interest rates	Segment rates (6%, 6%, 7%)
Salary increases	5% per year

Credit balance in funding standard account as of 12/31/2007: \$1,000.

Actuarial (market) value of assets at 1/1/2008: \$28,000.

Data for sole plan participant:

Date of birth	1/1/1968
Date of hire	1/1/1997
2007 salary	\$80,000

Selected actuarial factors:

Interest Rate	$\ddot{a}_{65}^{(12)}$
6%	9.00
7%	8.00

The employer does not elect to decrease the funding standard carryover balance or apply it against the **minimum required contribution**.

Question 20

In what range is the **minimum required contribution** for the 2008 plan year as of 1/1/2008?

- (A) Less than \$2,000
- (B) \$2,000 but less than \$3,500
- (C) \$3,500 but less than \$5,000
- (D) \$5,000 but less than \$6,500
- (E) \$6,500 or more

2007

Data for Question 21 (4 points)

Credit balance in funding standard account as of 12/31/2007: \$10,000.

Selected valuation results as of 1/1/2008:

Funding target	\$1,000,000
Target normal cost	100,000
Actuarial (market) value of assets	900,000
Effective interest rate	5.75%

Amortization factor for the shortfall amortization installment: 5.9982.

Actual return on plan assets for 2008: 15%.

Contribution made for 2008 on 12/31/2008: \$200,000.

The entire carryover balance is used to reduce the **minimum required contribution**.

\$X = the amount as of 12/31/2008 by which the contribution exceeds the **smallest amount that satisfies the minimum funding standard**.

Question 21

In what range is \$X?

- (A) Less than \$84,500
- (B) \$84,500 but less than \$85,250
- (C) \$85,250 but less than \$86,000
- (D) \$86,000 but less than \$86,750
- (E) \$86,750 or more

2007

Data for Question 22 (1 point)

Selected valuation results as of 1/1/2008:

Funding target based on at-risk assumptions	\$1,000,000
Actuarial (market) value of assets	770,000
Carryover balance	60,000

The plan has always had over 500 participants.

Consider the following statement:

The plan is in at-risk status for the 2009 plan year.

Question 22

Is the above statement true or false?

(A) True

(B) False



2007

Data for Question 23 (3 points)

Interest rates: Segment rates (5%, 6%, 7%).

Expected benefit payments at the beginning of the year for all years:

<u>Year</u>	<u>Expected Benefit Payments</u>
1	\$ 1,000
2	0
3	0
4	0
5	5,000
6	0
7	0
8	0
9	19,500
10	0

Question 23

In what range is the effective interest rate for 2008?

- (A) Less than 5.20%
- (B) 5.20% but less than 5.45%
- (C) 5.45% but less than 5.70%
- (D) 5.70% but less than 5.95%
- (E) 5.95% or more

Data for Question 24 (2 points)

An employer sponsors a defined benefit plan and a profit sharing plan. Both plans are in the top-heavy mandatory aggregation group. The aggregated plans are top-heavy.

Consider the following statements regarding participants covered by both plans:

- I. The top-heavy minimum is deemed satisfied by a 3% allocation in the profit sharing plan.
- II. The top-heavy minimum is deemed satisfied by a profit sharing allocation that is at least comparable under Revenue Ruling 81-202 to a defined benefit top-heavy minimum.
- III. The top-heavy minimum is deemed satisfied by providing a defined benefit top-heavy minimum offset by the benefits provided under the profit sharing plan.

Question 24

Which, if any, of the above statement(s) is (are) true?

- (A) I and II only
- (B) I and III only
- (C) II and III only
- (D) I, II, and III
- (E) The correct answer is not given by (A), (B), (C), or (D) above.

Data for Question 25 (2 points)

Consider the following statements regarding the minimum funding requirements for multiemployer plans for plan years beginning after 12/31/2007:

- I. The amortization period is 15 years for the change in liability due to all plan amendments effective on or after 1/1/2008.
- II. The alternative minimum funding standard account no longer applies.
- III. Assumptions must be individually reasonable.

Question 25

Which, if any, of the above statement(s) is (are) true?

- (A) I and II only
- (B) I and III only
- (C) II and III only
- (D) I, II, and III
- (E) The correct answer is not given by (A), (B), (C), or (D) above.

Data for Question 26 (2 points)

This question consists of an assertion in the left-hand column and a reason in the right-hand column.

ASSERTION

It is not necessary to consider the probability of participants electing a lump sum option when setting the assumptions for determining minimum funding requirements.

REASON

The funding target cannot reflect the interest rate subsidy, if any, inherent in lump sum distributions.

Question 26

Which of the following statements is true?

- (A) Both the assertion and the reason are true statements and the reason is a correct explanation of the assertion.
- (B) Both the assertion and the reason are true statements and the reason is NOT a correct explanation of the assertion.
- (C) The assertion is a true statement, but the reason is a false statement.
- (D) The assertion is a false statement, but the reason is a true statement.
- (E) Both the assertion and the reason are false statements.

2007

Data for Question 27 (2 points)

An additional funding charge was required for the 2007 plan year.

The 2008 funding target attainment percentage is 78%, determined without regard to the at-risk rules.

The 2008 funding target attainment percentage is 67%, determined using the additional actuarial assumptions for at-risk plans.

The plan has always had more than 500 participants.

Consider the following statement:

The plan is in at-risk status for the 2009 plan year.

Question 27

Is the above statement true or false?

(A) True

(B) False

Data for Question 28 (4 points)

Type of plan: Multiemployer.

Plan effective date: 1/1/1992.

The benefit formula was increased for all service effective 1/1/2008.

Valuation date: 1/1/2008.

Actuarial cost method: Unit credit.

Valuation interest rate: 7% per year.

Credit balance in funding standard account as of 12/31/2007: \$60,000.

Accrued liability after plan amendment as of 1/1/2008: \$9,710,000.

Actuarial (market) value of assets as of 1/1/2008: \$9,238,000.

Funding standard account amortization data as of 1/1/2008:

Outstanding balance of pre-2008 amortization bases	\$15,000
Experience loss during 2007	110,000

Question 28

In what range is the absolute value of the amortization amount in the funding standard account due to the plan amendment as of 1/1/2008?

- (A) Less than \$30,000
- (B) \$30,000 but less than \$34,000
- (C) \$34,000 but less than \$38,000
- (D) \$38,000 but less than \$42,000
- (E) \$42,000 or more

2007

Data for Question 29 (3 points)

Type of plan: Multiemployer.

Plan effective date: 1/1/1984.

Actuarial cost method: Entry age normal.

Valuation interest rate: 7% per year.

Credit balance in funding standard account as of 12/31/2007: \$75,500.

Actuarial (market) value of assets as of 1/1/2008: \$991,600.

Information on all funding standard account amortization bases as of 1/1/2008:

Outstanding balance of pre-2007 bases	\$404,600
Amortization of experience loss during 2007	6,770
Amortization of 2008 change in assumptions	8,180

Question 29

In what range is the accrued liability as of 1/1/2008?

- (A) Less than \$1,460,000
- (B) \$1,460,000 but less than \$1,490,000
- (C) \$1,490,000 but less than \$1,520,000
- (D) \$1,520,000 but less than \$1,550,000
- (E) \$1,550,000 or more

2007

Data for Question 30 (3 points)

Plan effective date: 1/1/1984.

Funding standard carryover balance as of 1/1/2008: \$125,000.

Selected valuation data as of 1/1/2008:

Funding target	\$5,000,000
Target normal cost	200,000
Actuarial (market) value of assets	4,200,000

Amortization factor for the 1/1/2008 shortfall amortization installment: 5.9982.

The employer makes a single contribution of \$X on 1/1/2008 in the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

Question 30

In what range is \$X?

- (A) Less than \$214,000
- (B) \$214,000 but less than \$222,000
- (C) \$222,000 but less than \$230,000
- (D) \$230,000 but less than \$238,000
- (E) \$238,000 or more



2007

Data for Question 31 (4 points)

Type of plan: Multiemployer plan.

Valuation interest rate: 7% per year.

Valuation data for retired participant Smith as of 1/1/2007:

Date of birth	1/1/1947
Retirement date	1/1/2002
Monthly benefit	\$1,250
Payment form selected	Life and 10 year certain

Smith died on 12/31/2007.

Selected commutation functions:

<u>Age</u>	<u><math>D_x</math></u>	<u><math>N_x^{(12)}</math></u>
60	16,285	187,842
61	15,127	171,557
65	11,154	117,315
66	10,305	106,161

Question 31

In what range is the absolute value of the mortality (gain)/loss during 2007 due to Smith's death?

- (A) Less than \$113,000
- (B) \$113,000 but less than \$114,000
- (C) \$114,000 but less than \$115,000
- (D) \$115,000 but less than \$116,000
- (E) \$116,000 or more

Data for Question 32 (2 points)

Consider the following statements concerning the funding of single employer defined benefit plans under PPA:

- I. Beginning 1/1/2008, the carryover balance may be used to reduce a plan's **minimum required contribution** only if the plan meets certain funding requirements.
- II. Beginning 1/1/2008, the actuarial value of assets must be between 90% and 110% of the fair market value of assets.
- III. Beginning 1/1/2008, a single blended interest rate may be used to determine the plan's target normal cost.

Question 32

Which, if any, of the above statement(s) is (are) true?

- (A) I and II only
- (B) I and III only
- (C) II and III only
- (D) I, II, and III
- (E) The correct answer is not given by (A), (B), (C), or (D) above.

2007

Data for Question 33 (5 points)

Type of plan: Multiemployer plan.

Normal retirement benefit: 2% of final three-year average salary per year of service.

Early retirement eligibility: Age 63.

Early retirement benefit: Accrued benefit, reduced by 5% for each year by which the benefit commencement date precedes age 65. The accrued benefit will not be reduced if the participant has at least 25 years of service.

Selected actuarial assumptions:

Valuation interest rate	7% per year	
Compensation increases	3% per year	
Retirement rates	<u>Age</u>	<u>Rate</u>
	63	0.25
	64	0.50
	65	1.00

Data for participant Smith:

Date of birth	1/1/1955
Date of hire	1/1/1994
Compensation during 2007	\$17,000

Selected annuity values:  $\ddot{a}_{63}^{(12)} = 12.36$        $\ddot{a}_{64}^{(12)} = 11.49$        $\ddot{a}_{65}^{(12)} = 10.60$

Question 33

In what range is the present value of future benefits for Smith as of 1/1/2008?

- (A) Less than \$58,500
- (B) \$58,500 but less than \$59,500
- (C) \$59,500 but less than \$60,500
- (D) \$60,500 but less than \$61,500
- (E) \$61,500 or more

Data for Question 34 (4 points)

Type of plan: Multiemployer plan.

Normal retirement benefit: \$35 per month per year of service.

Early retirement eligibility: Age 55 and 10 years of service.

Early retirement benefit: Accrued benefit reduced  $1/180^{\text{th}}$  per month for the first 60 months and  $1/360^{\text{th}}$  per month for the next 60 months by which the benefit commencement precedes age 65.

Actuarial cost method: Unit credit.

Selected actuarial assumptions:

Valuation interest rate 7% per year

Retirement rates	<u>Age</u>	<u>Rate</u>
	55	0.40
	62	0.80
	65	1.00

Data for participant Smith:

Date of birth	1/1/1959
Date of hire	1/1/1985

Selected annuity values:

$$\ddot{a}_{55}^{(12)} = 13.66 \qquad \ddot{a}_{62}^{(12)} = 12.85 \qquad \ddot{a}_{65}^{(12)} = 10.50$$

Question 34

In what range is the accrued liability for Smith as of 1/1/2008?

- (A) Less than \$40,000
- (B) \$40,000 but less than \$52,000
- (C) \$52,000 but less than \$64,000
- (D) \$64,000 but less than \$76,000
- (E) \$76,000 or more

2007

Data for Question 35 (3 points)

Plan effective date: 1/1/1990.

An additional funding charge was required for the 2007 plan year.

Credit balance in funding standard account as of 12/31/2007: \$10,000.

Selected valuation results as of 1/1/2008:

Funding target	\$1,050,000
Target normal cost	49,000
Actuarial value of assets	990,000
Market value of assets	940,000

Amortization factor for the 1/1/2008 shortfall amortization installment: 5.9982.

The employer makes a single contribution of \$X on 1/1/2008 in the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

Question 35

In what range is \$X?

- (A) Less than \$34,000
- (B) \$34,000 but less than \$42,000
- (C) \$42,000 but less than \$50,000
- (D) \$50,000 but less than \$58,000
- (E) \$58,000 or more

2007

Data for Question 36 (3 points)

An additional funding charge was required for the 2007 plan year.

Credit balance in the funding standard account as of 12/31/2007: \$20,000.

Selected valuation results as of 1/1/2008:

Funding target without regard to at-risk assumptions	\$600,000
Funding target reflecting additional actuarial assumptions for at-risk plans	700,000
Actuarial (market) value of assets	580,000
Effective interest rate	7.0%

The number of plan participants has never exceeded 500.

Consider the following statements:

- I. The plan sponsor may elect to apply any remaining funding standard carryover balance against the 2009 **minimum required contribution**.
- II. The plan is considered at-risk for 2009.
- III. The plan is subject to a shortfall amortization charge in 2008.

Question 36

Which, if any, of the above statement(s) is (are) true?

- (A) I and II only
- (B) I and III only
- (C) II and III only
- (D) I, II, and III
- (E) The correct answer is not given by (A), (B), (C), or (D) above.

2007

Data for Question 37 (3 points)

The plan was not subject to IRC section 412(l) for the 2007 plan year.

Credit balance in the funding standard account as of 12/31/2007: \$5,000.

Selected valuation results as of 1/1/2008:

Funding target	\$1,050,000
Target normal cost	49,000
Actuarial value of assets	990,000
Market value of assets	930,000

Amortization factor for the 1/1/2008 shortfall amortization installment: 5.9982.

The employer makes a single contribution of \$X on 1/1/2008 in the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

Question 37

In what range is \$X?

- (A) Less than \$45,000
- (B) \$45,000 but less than \$49,000
- (C) \$49,000 but less than \$53,000
- (D) \$53,000 but less than \$57,000
- (E) \$57,000 or more

Question 38 (1 point)

Consider the following statement regarding a defined benefit plan determined to be in at-risk status in the 2008 plan year.

The at-risk funding target must be determined using the assumption that all employees who are not otherwise assumed to retire as of the valuation date but who will be eligible to elect benefits in the plan year or in the next 10 succeeding plan years will retire at the earliest date permitted under the plan, but not before the last day of the 2008 plan year.

Question 38

Is the above statement true or false?

(A) True

(B) False



2007

Data for Question 39 (1 point)

Consider the following statement regarding a defined benefit plan with a funding standard carryover balance on 1/1/2009.

The unused portion of the funding standard carryover balance is adjusted from 1/1/2008 to 1/1/2009 using the effective interest rate for the 2008 plan year.

Question 39

Is the above statement true or false?

- (A) True
- (B) False

2007

Data for Question 40 (5 points)

Interest rates as of 1/1/2008:

Current liability basis, reflecting pre-PPA rules	5.78%
Segment rates ignoring IRC section 430(h)(2)(G)	(5%, 6%, 7%)

Credit balance in the funding standard account as of 12/31/2007: \$0.

Data for participant Smith as of 1/1/2008:

Benefit commencement date	1/1/2006
Monthly benefit	\$1,750
Form of benefit selected	10-year certain only

The employer has not elected to forego the interest rate transition rules in IRC section 430(h)(2)(G).

Question 40

In what range is the funding target for Smith as of 1/1/2008?

- (A) Less than \$136,100
- (B) \$136,100 but less than \$136,400
- (C) \$136,400 but less than \$136,700
- (D) \$136,700 but less than \$137,000
- (E) \$137,000 or more

Data for Question 41 (3 points)

Assume that, as of 2013, a defined benefit plan has the following history:

<u>Year</u>	<u>Funding target attainment percentage</u>	<u>At-risk funding attainment percentage</u>
2010	74%	65%
2011	78%	68%
2012	79%	71%
2013	78%	69%

Consider the following statements:

- I. The plan was in at-risk status for 2011.
- II. The plan was in at-risk status for 2012.
- III. The plan was in at-risk status for 2013.

Question 41

Which, if any, of the above statement(s) is (are) true?

- (A) I and II only
- (B) I and III only
- (C) II and III only
- (D) I, II, and III
- (E) The correct answer is not given by (A), (B), (C), or (D) above.

2007

Data for Question 42 (3 points)

An additional funding charge was required for the 2007 plan year.

Credit balance in funding standard account as of 12/31/2007: \$100,000.

Selected valuation results as of 1/1/2008:

Funding target	\$5,500,000
Target normal cost	200,000
Actuarial (market) value of assets	5,000,000
Effective interest rate	5.75%

Amortization factor for the 1/1/2008 shortfall amortization installment: 5.9982.

The employer makes a single contribution of \$X on 12/31/2008 in the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

Question 42

In what range is \$X?

- (A) Less than \$200,000
- (B) \$200,000 but less than \$210,000
- (C) \$210,000 but less than \$220,000
- (D) \$220,000 but less than \$230,000
- (E) \$230,000 or more

Data for Question 43 (4 points)

Type of plan: Multiemployer plan.

Actuarial cost method: Unit credit.

Form of benefit:

While participant is alive	\$100,000 per year payable on 1/1 of each year
After participant dies	\$50,000 per year payable on 1/1 of each year to the retiree's beneficiary

Valuation interest rate: 7% per year.

Data for retired participant Smith:

Date of birth	1/1/1937
Beneficiary's date of birth	1/1/1940

Selected annuity values:

$$\ddot{a}_{67} = 8.30 \quad \ddot{a}_{68} = 8.10 \quad \ddot{a}_{70} = 7.60 \quad \ddot{a}_{71} = 7.40 \quad \ddot{a}_{67:70} = 6.10$$

Smith receives the scheduled \$100,000 payment on 1/1/2007.

\$X = mortality gain if Smith survives to 1/1/2008, but his beneficiary dies during 2007.

\$Y = mortality gain if Smith dies during 2007, but his beneficiary survives to 1/1/2008.

Question 43

In what range is the absolute value of the sum of \$X + \$Y?

- (A) Less than \$500,000
- (B) \$500,000 but less than \$575,000
- (C) \$575,000 but less than \$650,000
- (D) \$650,000 but less than \$725,000
- (E) \$725,000 or more

Data For Question 44 (1 point)

Consider the following statement:

PPA requires that the funding target for a plan in at-risk status be calculated under the assumption that all active participants will elect a joint & survivor form of benefit at the earliest retirement age permitted under the plan.

Question 44

Is the above statement true or false?

- A) True
- B) False

Data for Question 45 (4 points)

Plan effective date: 1/1/1984.

Type of plan: Multiemployer plan.

Actuarial cost method: Unit credit.

Valuation interest rate: 7% per year.

Credit balance in the funding standard account as of 12/31/2007: \$3,000.

Selected information on all outstanding pre-2008 amortization bases as of 1/1/2008:

Net outstanding balance	\$45,900
Net amortization charge	9,000

The benefit formula was increased for all service effective 1/1/2008. The formula change increased both the accrued liability and the normal cost by 10%.

Selected valuation results as of 1/1/2008 (before plan changes):

Accrued liability	\$270,000
Normal cost	22,000
Actuarial (market) value of assets	250,000

The employer makes a single contribution of \$X on 12/31/2008 in the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

Question 45

In what range is \$X?

- (A) Less than \$32,500
- (B) \$32,500 but less than \$35,000
- (C) \$35,000 but less than \$37,500
- (D) \$37,500 but less than \$40,000
- (E) \$40,000 or more

2007

Data for Question 46 (3 points)

The plan was not subject to IRC section 412(l) for the 2007 plan year.

Credit balance in the funding standard account as of 12/31/2007: \$2,000.

Selected valuation results as of 1/1/2008:

Funding target	\$115,000
Target normal cost	12,250
Actuarial (market) value of assets	107,000
Effective interest rate	6.00%

Amortization factor for the 1/1/2008 shortfall amortization installment: 5.9982.

The employer makes a single contribution of \$X on 12/31/2008 in the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

Question 46

In what range is \$X?

- (A) Less than \$10,500
- (B) \$10,500 but less than \$11,000
- (C) \$11,000 but less than \$11,500
- (D) \$11,500 but less than \$12,000
- (E) \$12,000 or more



2007

Data for Question 47 (3 points)

Consider the following three defined benefit plans maintained by three unrelated employers:

	<u>Plan X</u>	<u>Plan Y</u>	<u>Plan Z</u>
Funding standard carryover balance as of 1/1/2008	\$12,000	\$0	\$4,000
1/1/2008 funding target without regard to at-risk assumptions	112,000	106,000	95,000
1/1/2008 funding target determined using the additional actuarial assumptions for at-risk plans	125,000	124,000	118,000
Actuarial value of assets as of 1/1/2008	74,000	85,000	64,000
Number of plan participants during each day of 2008	950	750	550
Number of plan participants as of 1/1/2009	1,000	750	450

Question 47

Which, if any, of the above plans is (are) considered to be in at-risk status for 2009?

- (A) Plans X and Y only
- (B) Plans X and Z only
- (C) Plans Y and Z only
- (D) Plans X, Y, and Z
- (E) The correct answer is not given by (A), (B), (C), or (D) above.

2007

Data for Question 48 (3 points)

The plan was not subject to IRC section 412(l) for the 2007 plan year.

Credit balance in funding standard account as of 12/31/2007: \$12,000.

Selected valuation results as of 1/1/2008:

Funding target	\$64,000
Target normal cost	21,000
Actuarial (market) value of assets	60,000
Effective interest rate	6.00%

Amortization factor for the 1/1/2008 shortfall amortization installment: 5.9982.

The employer makes a single contribution of \$X on 12/31/2008 in the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

Question 48

In what range is \$X?

- (A) Less than \$10,000
- (B) \$10,000 but less than \$11,000
- (C) \$11,000 but less than \$12,000
- (D) \$12,000 but less than \$13,000
- (E) \$13,000 or more

Data for Question 49 (1 point)

A multiemployer plan that is classified as Seriously Endangered cannot pay lump sum payments or any other form of accelerated payment.

Question 49

Is the above statement true or false?

(A) True

(B) False

2007

Data for Question 50 (3 points)

An additional funding charge was required for the 2007 plan year.

Credit balance in funding standard account as of 12/31/2007: \$20,000.

Selected valuation results as of 1/1/2008:

Funding target	\$1,650,000
Target normal cost	44,800
Actuarial (market) value of assets	1,680,000
Effective interest rate	5.75%

Amortization factor for the 1/1/2008 shortfall amortization installment: 5.9982.

The employer makes a single contribution of \$X on 12/31/2008 in the **smallest amount that satisfies the minimum funding standard** for the 2008 plan year.

Question 50

In what range is \$X?

- (A) Less than \$16,000
- (B) \$16,000 but less than \$26,000
- (C) \$26,000 but less than \$36,000
- (D) \$36,000 but less than \$46,000
- (E) \$46,000 or more

2007

Data for Question 51 (4 points)

Normal retirement benefit: \$10 per month times years of service.

Valuation interest rates:

Segment rates      (5%, 6%, 7%)  
Effective rate      5.75%

Data for active participants as of 1/1/2008:

<u>Number</u>	<u>Age</u>	<u>Service</u>
100	50	20

Funding target as of 1/1/2008 attributable to inactive plan participants: \$750,000.

Selected commutation values:

<u>Age</u>	<u>5.00% Interest</u>		<u>6.00% Interest</u>		<u>7.00% Interest</u>	
	<u><math>N_x^{(12)}</math></u>	<u><math>D_x</math></u>	<u><math>N_x^{(12)}</math></u>	<u><math>D_x</math></u>	<u><math>N_x^{(12)}</math></u>	<u><math>D_x</math></u>
65	4,108	368	2,052	199	1,035	108
70	2,534	263	1,220	136	593	70
85	292	59	126	26	55	12

Question 51

In what range is the funding target as of 1/1/2008?

- (A) Less than \$1,620,000
- (B) \$1,620,000 but less than \$1,650,000
- (C) \$1,650,000 but less than \$1,680,000
- (D) \$1,680,000 but less than \$1,710,000
- (E) \$1,710,000 or more

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**2007 EA-2A Examination Answer Key**

<b><u>Question</u></b>	<b><u>Answer</u></b>		<b><u>Question</u></b>	<b><u>Answer</u></b>
1	B		41	A
2	B		42	C
3	C		43	B
4	B		44	B
5	B		45	B
6	C		46	B
7	B		47	B
8	C		48	A
9	D		49	B
10	B		50	A
11	C		51	B
12	B			
13	C			
14	B			
15	B			
16	D			
17	A			
18	B			
19	D			
20	B			
21	C			
22	B			
23	D			
24	C			
25	C			
26	E			
27	B			
28	D			
29	B			
30	C			
31	D			
32	A			
33	C			
34	B			
35	D			
36	B			
37	A			
38	A			
39	B			
40	A			

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