

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

Enrolled Actuaries Pension Examination, Segment F

EA-2, Segment F

Date: Tuesday, November 4, 2014

Time: 8:30 a.m. – 12:30 p.m.

INSTRUCTIONS TO CANDIDATES

1. Write your candidate number here _____. Your name must not appear.
2. Do not break the seal of this book until the supervisor tells you to do so.
3. Special conditions generally applicable to all questions on this examination are found at the front of this book.
4. All questions should be answered in accordance with laws, rules and regulations in effect as of May 31, 2014.
5. This examination consists of 55 multiple-choice questions of varying value. The point value for each question is shown in parentheses at the beginning of each question. Total point value is 160.
6. Your score will be based on the point values for the questions that you answer correctly. No credit will be given for omitted answers and no credit will be lost for wrong answers; hence, you should answer all questions even those for which you have to guess. Answer choices C, D, and E will be considered incorrect answers on True-False questions.
7. A separate answer sheet is inside the front cover of this book. During the time allotted for this examination, record all your answers on side 2 of the answer sheet. **NO ADDITIONAL TIME WILL BE ALLOWED FOR THIS PURPOSE.** No credit will be given for anything indicated in the examination book but not transferred to the answer sheet. Failure to stop writing or coding your answer sheet after time is called will result in the disqualification of your answer sheet or further disciplinary action.
8. Up to five answer choices are given with each question, each answer choice being identified by a key letter (A to E). For each question, blacken the oval on the answer sheet which corresponds to the key letter of the answer choice that you select.
9. Use a soft-lead pencil to mark the answer sheet. To facilitate correct mechanical scoring, be sure that, for each question, your pencil mark is dark and completely fills only the intended oval. Make no stray marks on the answer sheet. If you have to erase, do so completely.
10. Do not spend too much time on any one question. If a question seems too difficult, leave it and go on.
11. While every attempt is made to avoid defective questions, sometimes they do occur. If you believe a question is defective, the supervisor or proctor cannot give you any guidance beyond the instructions on the exam booklet.
12. Clearly indicated answer choices in the test book can be an aid in grading examinations in the unlikely event of a lost answer sheet.
13. Use the blank portions of each page for your scratch work. Extra blank pages are provided at the back of the examination book.
14. When the supervisor tells you to do so, break the seal on the book and remove the answer sheet.

On the front of the answer sheet, space is provided to write and code candidate information. Complete the information requested by printing in the squares and blackening the circles (one in each column) corresponding to the letters or numbers printed. For each empty box blacken the small circle immediately above the "A" circle. Fill out the boxes titled:
 - (a) Name
(include last name, first name and middle initial)
 - (b) Candidate Number
(Candidate/Eligibility Number, use leading zeros if needed to make it a five digit number)
 - (c) Test Site Code
(the supervisor will supply the number)
 - (d) Examination Part
(code the examination that you are taking by blackening the circle to the left of "Course EA-2, Segment F")
 - (e) Booklet Number
(booklet number can be found in the upper right-hand corner of this examination book. Use leading zeros if needed to make it a four digit number.)
15. After the examination, the supervisor will collect this book and the answer sheet separately. **DO NOT ENCLOSE THE ANSWER SHEET IN THE BOOK.** All books and answer sheets must be returned. **THE QUESTIONS ARE CONFIDENTIAL AND MAY NOT BE TAKEN FROM THE EXAMINATION ROOM.**

Answer Key EA-2F Fall 2014
October 22, 2014

Question	Answer		Question	Answer
1	B		31	B
2	C		32	A
3	B		33	D
4	D		34	A
5	D		35	A
6	A		36	B
7	A		37	D
8	B		38	B
9	A		39	B
10	D		40	B
11	D		41	A
12	D		42	B
13	B		43	C
14	B		44	B
15	A		45	A
16	D		46	A
17	C		47	C
18	C		48	D
19	A		49	C
20	B		50	B
21	D		51	B
22	C		52	D
23	B		53	D
24	A		54	C
25	A		55	B
26	C			
27	A			
28	C			
29	D			
30	E			

****BEGINNING OF EXAMINATION****

Data for Question 1 (4 points)

Valuation date: 1/1/2015.

The plan provides a temporary \$1,000 monthly supplement payable from retirement to age 62 to participants who complete 15 years of service and retire from active employment after attaining age 60.

Segment rates: {5.0%, 6.0%, 7.0% }.

Selected data for participant Smith:

Gender	Male
Date of birth	1/1/1955
Date of hire	1/1/1995

Assumed rates of retirement:

<u>Age</u>	<u>Rate</u>
60	35%
61	25%

No preretirement death is assumed.

$\$X$ is the portion of the funding target as of 1/1/2015 attributable to Smith's temporary supplement.

Question 1

In what range is $\$X$?

- (A) Less than \$9,500
- (B) \$9,500 but less than \$9,750
- (C) \$9,750 but less than \$10,000
- (D) \$10,000 but less than \$10,250
- (E) \$10,250 or more

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Data for Question 2 (3 points)

Selected information as of 1/1/2015:

Funding standard carryover balance	\$25,000
Prefunding balance	75,000
Minimum required contribution	\$100,000
Effective interest rate	6.0%

Actual rate of return on assets during 2015: (5.0%)

No quarterly installments are required for the 2015 plan year.

An election is made on 1/1/2015 to apply \$15,000 of the funding balances to the 2015 minimum required contribution.

A contribution of \$115,000 is made on 12/1/2015.

Question 2

In what range is the prefunding balance as of 1/1/2016?

- (A) Less than \$94,000
- (B) \$94,000 but less than \$95,000
- (C) \$95,000 but less than \$96,000
- (D) \$96,000 but less than \$97,000
- (E) \$97,000 or more

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Data for Question 3 (3 points)

Type of plan: Multiemployer.

Actuarial cost method: Projected unit credit.

Valuation interest rate: 7.0%.

Compensation increase assumption: 3.0% per year.

Benefit formula: 2% of final year's compensation times years of service, maximum 25 years.

Selected data for participant Smith as of 1/1/2015:

Date of birth	1/1/1975
Date of hire	1/1/2005
Compensation for 2014 plan year	\$77,000

Selected annuity factor:

$$\ddot{a}_{65}^{(12)} = 10.11$$

Question 3

In what range is the normal cost for Smith as of 1/1/2015?

- (A) Less than \$5,000
- (B) \$5,000 but less than \$7,000
- (C) \$7,000 but less than \$9,000
- (D) \$9,000 but less than \$11,000
- (E) \$11,000 or more

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Data for Question 4 (4 points)

Type of plan: Multiemployer.

Early retirement provisions:

Eligibility	Age 55
Benefit amount for retirements:	
Before 1/1/2015	Accrued benefit, reduced 5.0% per year by which benefits commence before age 65
On and after 1/1/2015	Accrued benefit, reduced 3.0% per year by which benefits commence before age 65

Actuarial cost method: Unit credit.

Credit balance as of 12/31/2014: \$15,000.

Selected actuarial assumptions for 1/1/2015 valuation:

Interest rate	7.0%
Retirement	100% at age 62

Selected information (before plan amendment) as of 1/1/2015:

Actuarial (market) value of assets	\$1,270,000
Accrued liability for all active participants	1,170,000
Accrued liability for all other participants	410,000
Normal cost	240,000
Total amortization charges	140,000
Total amortization credits	60,000

All active participants are under age 60 as of 1/1/2015.

Question 4

In what range is the **smallest amount that satisfies the minimum funding standard** as of 12/31/2015?

- (A) Less than \$336,000
- (B) \$336,000 but less than \$342,000
- (C) \$342,000 but less than \$348,000
- (D) \$348,000 but less than \$354,000
- (E) \$354,000 or more

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Data for Question 5 (4 points)

Valuation date: 1/1/2015.

Funding standard carryover balance as of 1/1/2015: \$170,000.

Prefunding balance as of 1/1/2015: \$110,000.

Actual rate of return on assets for 2015: 22.50%.

Selected information as of 1/1/2015:

Minimum required contribution	\$260,000
Effective interest rate	6.20%

On 1/1/2015, the plan sponsor elects to apply \$250,000 of balances to offset the minimum required contribution for 2015.

For the 2015 plan year, the plan sponsor contributes \$300,000 on 7/1/2015 and \$200,000 on 7/1/2016.

$\$X$ is the maximum permissible amount the plan sponsor may elect to add to prefunding balance as of 1/1/2016, assuming the election takes place after the 7/1/2016 contribution.

Question 5

In what range is $\$X$?

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

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Data for Question 6 (2 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2015.

Actuarial cost method: Aggregate.

There are no pre-retirement decrements other than mortality.

On 1/1/2015, the plan is amended to increase the pre-retirement death benefit.

Consider the following statements with respect to the 2015 valuation for this defined benefit pension plan:

- I. The increase in the plan liability due to this amendment will be amortized over 15 years.
- II. The plan amendment and any assumption changes may establish one single amortization base for minimum funding purposes.
- III. The plan actuary must change the valuation assumptions.

Question 6

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

- (A) None
- (B) I only
- (C) II only
- (D) III only
- (E) The correct answer is not given by (A), (B), (C), or (D) above.

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Data for Question 7 (1 point)

Consider the following statement concerning the deductible limit for a multiemployer plan:

In determining the maximum deductible limit, an amendment increasing benefits adopted after the close of such plan year but no later than 2 years after the close of such plan year may be deemed to have been made on the first day of such plan year, at the election of the plan administrator.

Question 7

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 8 (4 points)

Valuation date: 1/1/2014.

Normal retirement benefit: 3% of highest consecutive three-year average compensation multiplied by years of service.

Segment rates: {5.0%, 6.0%, 7.0% }.

Assumed compensation increases: 3.0% per year.

Selected data for participant Smith:

Gender	Female
Date of birth	1/1/1950
Date of hire	1/1/2011
Date of participation	1/1/2013
2011 compensation	\$275,000
2012 compensation	275,000
2013 compensation	245,000

Question 8

What is the target normal cost for Smith?

- (A) Less than \$94,000
- (B) \$94,000 but less than \$98,000
- (C) \$98,000 but less than \$102,000
- (D) \$102,000 but less than \$106,000
- (E) \$106,000 or more

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Data for Question 9 (2 points)

An enrolled actuary is setting the retirement rate assumptions for a plan.

The plan offers actuarially reduced early retirement benefits starting at age 55.

The plan provides unreduced early retirement benefits starting at age 60.

The plan has 5,000 active participants.

Over the past 5 years, there has been a distribution of retirements from ages 55 through 65, and the average retirement age has been 62. The actuary knows of no reason to expect patterns to change significantly in the future.

Consider the following three sets of retirement rates:

<u>Age</u>	<u>I</u>	<u>II</u>	<u>III</u>
55	5%	0%	20%
56	2%	0%	20%
57	2%	8%	20%
58	2%	8%	12%
59	2%	10%	12%
60	15%	10%	10%
61	15%	10%	10%
62	30%	30%	30%
63	15%	0%	20%
64	15%	0%	20%
65	100%	100%	100%
Average Retirement Age	62	62	59

Question 9

Which of these sets of retirement rates would be most reasonable for the plan's funding valuation?

- (A) I
- (B) II
- (C) III

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Data for Question 10 (4 points)

Valuation date: 1/1/2015.

Normal retirement benefit: 1.5% times final year compensation times years of service.

Segment rates: {5.0%, 6.0%, 7.0% }.

Selected information as of 1/1/2015:

Funding standard carryover balance	\$1,000
Prefunding balance	5,000
Actuarial (market) value of assets	55,000
Compensation increase assumption	3% per year
Effective interest rate	7%
Shortfall amortization bases arising in prior years	None

Selected data for sole participant Smith:

Date of birth	1/1/1972
Date of hire	1/1/2000
2014 compensation	\$100,000

Selected annuity factors:

	<u>5.0%</u>	<u>6.0%</u>	<u>7.0%</u>
$\ddot{a}_{65}^{(12)}$	11.83	10.91	10.11

The plan sponsor did not make any election to use funding balances to meet the 2015 minimum requirement.

Question 10

In what range is the **minimum required contribution**?

- (A) Less than \$2,300
- (B) \$2,300 but less than \$3,300
- (C) \$3,300 but less than \$4,300
- (D) \$4,300 but less than \$5,300
- (E) \$5,300 or more

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Data for Question 11 (3 points)

Prefunding balance as of 1/1/2014: \$25,000.

Selected information as of 1/1/2014:

Actuarial (market) value of assets	\$1,100,000
Funding target	1,000,000
Minimum required contribution	100,000
Effective interest rate	6%

Actual rate of return on plan assets for 2014: 10%.

Required quarterly installments for 2014 plan year: \$0.

There was no election made to use the prefunding balance for the 2014 plan year.

Contribution paid on 2/1/2015 for the 2014 plan year: \$150,000.

$\$X$ is the maximum prefunding balance as of 1/1/2015.

Question 11

In what range is $\$X$?

- (A) Less than \$66,000
- (B) \$66,000 but less than \$68,000
- (C) \$68,000 but less than \$70,000
- (D) \$70,000 but less than \$72,000
- (E) \$72,000 or more

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Data for Question 12 (5 points)

Type of plan: Multiemployer.

Normal retirement benefit: 2% of final compensation per year of service.

Actuarial cost method: Projected unit credit.

Selected actuarial assumptions as of 1/1/2015:

Interest rate	7.5%
Compensation increases	3.5% per year

Data for active participant Smith as of 1/1/2015:

Date of birth	1/1/1973
Date of hire	1/1/2011
2014 compensation	\$78,000

Selected annuity factors:

	<u>7.0%</u>	<u>7.5%</u>
$\ddot{a}_{65}^{(12)}$	10.11	9.72

$\$X$ is the change in Smith's normal cost as of 1/1/2015 if the sole assumption change is a reduction in the assumed interest rate from 7.5% to 7.0% for the 2015 valuation.

$\$Y$ is the change in Smith's normal cost as of 1/1/2015 if the sole assumption change is a reduction in the assumed compensation increase from 3.5% to 3.0% for the 2015 valuation.

Question 12

In what range is $|\$X| + |\$Y|$?

- (A) Less than \$500
- (B) \$500 but less than \$1,000
- (C) \$1,000 but less than \$1,500
- (D) \$1,500 but less than \$2,000
- (E) \$2,000 or more

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Data for Question 13 (4 points)

Valuation date: 1/1/2015.

Segment rates: {5.0%, 6.0%, 7.0% }.

Compensation increase assumption: 10% per year

Accrued benefit: 8% of final three-year average compensation multiplied by years of service.

Data for sole participant Smith:

Gender	Male
Date of birth	1/1/1952
Date of hire	1/1/2012
	<u>Compensation</u>
2012	\$100,000
2013	150,000
2014	200,000

Question 13

In what range is the target normal cost as of 1/1/2015?

- (A) Less than \$220,000
- (B) \$220,000 but less than \$240,000
- (C) \$240,000 but less than \$260,000
- (D) \$260,000 but less than \$280,000
- (E) \$280,000 or more

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Data for Question 14 (4 points)

Valuation date: 1/1/2015.

Type of plan: Multiemployer.

Disability benefit: Immediate accrued benefit reduced 5% for each year benefit commencement precedes age 65.

Actuarial cost method: Unit credit.

Interest rate: 7.0%.

Pre-retirement decrements: None, other than disability occurring at beginning of year.

<u>Age</u>	<u>Disability rate</u>
63	0.065
64	0.075

Data for participant Smith:

Date of birth	1/1/1952
Monthly accrued benefit	\$4,500

Selected annuity factors:	$\ddot{a}_{63}^{(12)}$	$\ddot{a}_{64}^{(12)}$	$\ddot{a}_{65}^{(12)}$
Disabled mortality	9.00	8.65	8.35
Healthy mortality	10.55	10.33	10.11

Question 14

In what range is the accrued liability for Smith as of 1/1/2015?

- (A) Less than \$467,000
- (B) \$467,000 but less than \$474,000
- (C) \$474,000 but less than \$481,000
- (D) \$481,000 but less than \$488,000
- (E) \$488,000 or more

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Data for Question 15 (2 points)

Valuation date: 1/1/2015.

The plan sponsor elected to apply \$200,000 in funding standard carryover balance on 1/1/2015 to offset the minimum required contribution for 2015.

The 2015 minimum required contribution was later determined to be \$180,000 as of 1/1/2015, so an excess election of \$20,000 exists for the 2015 plan year.

Consider the following statements regarding the excess funding balance usage:

- I. If such an excess election is not timely revoked, it has the same effect as an election to reduce the applicable balance to the extent of the excess.
- II. One of the conditions for the revocation of the excess election to be valid is that written notification of the revocation must be provided to the plan's enrolled actuary and the plan administrator.
- III. The revocation of the excess election must be completed on or before 9/15/2016 to be considered timely.

Question 15

Which, if any, of the above statements 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.

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Data for Question 16 (3 points)

Valuation date: 1/1/2015.

Asset valuation method: Fair market value.

Effective interest rate for 2014: 6.5%.

Rate of return on plan assets during 2014: 8.5%.

Effective interest rate for 2015: 5.0%.

Fair market value of assets as of 1/1/2015 (excluding receivables): \$2,500,000.

Contributions deposited for the 2014 plan year:

<u>Date</u>	<u>Amount</u>
6/15/2015	\$100,000
8/15/2015	300,000

$\$X$ is equal to the actuarial value of assets as of 1/1/2015.

Question 16

In what range is $\$X$?

- (A) Less than \$2,875,000
- (B) \$2,875,000 but less than \$2,879,000
- (C) \$2,879,000 but less than \$2,883,000
- (D) \$2,883,000 but less than \$2,887,000
- (E) \$2,887,000 or more

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Data for Question 17 (3 points)

Plan type: Statutory hybrid (cash balance).

The plan permits an immediate lump sum payment equal to the participant's hypothetical account balance upon termination of employment.

Selected assumptions as of 1/1/2015:

Interest crediting rate	5.5%
Segment rates	{4.0%, 5.0%, 6.0% }
Form of payment	Lump sum

Data for participant Smith as of 1/1/2015:

Age	62
Account balance	\$500,000

Question 17

In what range is the funding target for participant Smith as of 1/1/2015?

- (A) Less than \$500,000
- (B) \$500,000 but less than \$520,000
- (C) \$520,000 but less than \$540,000
- (D) \$540,000 but less than \$560,000
- (E) \$560,000 or more

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Data for Question 18 (5 points)

Plan effective date: 1/1/2010.

Segment rates for 2015: {5.0%, 6.0%, 7.0%}.

The plan is determined to be at-risk only in 2012, 2014 and 2015.

Selected information as of 1/1/2015:

Number of participants	1,130
Prefunding balance	\$400,000
Actuarial (market) value of assets	16,500,000
Funding target without regard to at-risk assumptions	15,300,000
At-risk funding target disregarding 5-year transition and loads	17,700,000

Information about the remaining shortfall amortization installments as of 1/1/2015:

<u>Year established</u>	<u>Installment</u>	<u>Outstanding balance</u>
2011	\$120,000	\$343,128
2012	15,000	55,848
2013	82,000	372,772
2014	75,000	<u>396,990</u>
Total		\$1,168,738

$\$X$ is the 2015 shortfall installment as of 1/1/2015.

Question 18

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

- (A) Less than \$40,000
- (B) \$40,000 but less than \$70,000
- (C) \$70,000 but less than \$100,000
- (D) \$100,000 but less than \$130,000
- (E) \$130,000 or more

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Data for Question 19 (1 point)

Consider the following statement with respect to selection of actuarial assumptions for a single-employer plan:

Combined mortality tables (annuitants and non-annuitants) are only permitted for plans with 500 or fewer participants.

Question 19

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 20 (4 points)

Valuation date: 1/1/2015.

Type of plan: Multiemployer.

Normal retirement benefit: 1.25% of final three-year average compensation per year of service.

Late retirement benefit: 1.25% of final three-year average compensation per year of service without actuarial increases.

Actuarial cost method: Projected unit credit.

Selected assumptions:

Valuation interest rate	5.0%
Compensation increases	2.5% per year
Retirement age	Normal retirement or current age if later

Data for selected plan participants:	<u>Smith</u>	<u>Jones</u>
Date of birth	1/1/1948	1/1/1960
Date of hire	1/1/2000	1/1/2008
2012 compensation	\$40,000	\$62,000
2013 compensation	\$49,000	\$65,000
2014 compensation	\$52,000	\$68,000

Selected annuity factors:

$$\ddot{a}_{65}^{(12)} = 11.83 \quad \ddot{a}_{66}^{(12)} = 11.50 \quad \ddot{a}_{67}^{(12)} = 11.18$$

The plan sponsor has distributed all required suspension of benefits notices.

$\$X$ is the total accrued liability for Smith and Jones as of 1/1/2015.

Question 20

In what range is $\$X$?

- (A) Less than \$145,000
- (B) \$145,000 but less than \$155,000
- (C) \$155,000 but less than \$165,000
- (D) \$165,000 but less than \$175,000
- (E) \$175,000 or more

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Data for Question 21 (4 points)

Plan year: 1/1/2015.

Selected information as of 1/1/2015:

Minimum required contribution	\$820,000
Required quarterly installment	150,000
Effective interest rate	5.0%

All contributions made for the 2015 plan year:

<u>Date</u>	<u>Amount</u>
7/15/2015	\$300,000
10/15/2015	150,000
1/15/2016	150,000
9/15/2016	\$X

\$X is the smallest amount that satisfies the minimum funding standard as of 9/15/2016.

Question 21

In what range is **\$X**?

- (A) Less than \$243,000
- (B) \$243,000 but less than \$253,000
- (C) \$253,000 but less than \$263,000
- (D) \$263,000 but less than \$273,000
- (E) \$273,000 or more

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Data for Question 22 (4 points)

Asset valuation method: The average of the market value of assets on the valuation date and the adjusted market value of assets for the preceding valuation date.

Segment rates for 2014: {5.5%, 6.5%, 7.5% }.

Segment rates for 2015: {5.0%, 6.0%, 7.0% }.

Selected information:

	<u>1/1/2014</u>	<u>1/1/2015</u>
Market value (excluding receivables)	\$250,000	\$328,000
Benefit payments, paid on 7/1	20,000	
Expenses, paid on 7/1	4,000	
Assumed rate of return	6.50%	
Effective interest rate	6.25%	5.50%

For the 2014 plan year, a contribution of \$20,000 is deposited on 1/2/2014 and another contribution of \$10,000 is deposited on 9/1/2015.

$\$X$ is the actuarial value of assets for the plan year beginning 1/1/2015.

Question 22

In what range is $\$X$?

- (A) Less than \$304,500
- (B) \$304,500 but less than \$304,750
- (C) \$304,750 but less than \$305,000
- (D) \$305,000 but less than \$305,250
- (E) \$305,250 or more

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Data for Question 23 (1 point)

Plan expenses are paid from the pension trust.

The plan requires mandatory employee contributions.

The plan has a funding shortfall.

Consider the following statement:

The target normal cost cannot be less than the present value of all benefits expected to accrue or be earned during the plan year.

Question 23

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 24 (1 point)

Consider the following statement:

Any funding standard carryover balance must be reduced to zero prior to using the prefunding balance to reduce the minimum required contribution.

Question 24

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 25 (1 point)

Consider the following statement with respect to selection of actuarial assumptions for a single-employer plan:

Regardless of size, a plan is permitted to use either the static mortality table or the generational mortality table for funding purposes.

Question 25

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 26 (3 points)

Valuation segment rates for the 1/1/2011 valuation: {5.0%, 6.0%, 7.0% }.

Effective interest rate for 2011: 6.0%.

Shortfall amortization base established as of 1/1/2011: \$55,000.

In 2011 an election is made to use a 15-year alternative amortization schedule under the Pension Relief Act of 2010. The 2011 amortization schedule was not treated as fully amortized in any year from 2012-2015.

Extraordinary dividend and redemption payments for 2014: \$17,500.

There were no installment acceleration amounts before 2014.

$\$X$ is the required installment for the 2015 plan year with respect to the shortfall amortization base established 1/1/2011.

Question 26

In what range is $\$X$?

- (A) Less than \$6,100
- (B) \$6,100 but less than \$7,100
- (C) \$7,100 but less than \$8,100
- (D) \$8,100 but less than \$9,100
- (E) \$9,100 or more

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Data for Question 27 (2 points)

Type of plan: Multiemployer.

Plan year: 10/1 – 9/30.

Valuation date: 10/1/2014.

Date of projected funding deficiency: 9/30/2022.

The plan sponsor has adopted a plan to improve the plan's funding status.

The plan is projected to have sufficient assets to pay benefits timely for at least the next 30 years.

The plan sponsor provided notice to affected parties on 12/14/2014.

The plan sponsor filed for the automatic extension of amortization on 12/15/2014.

Consider the following statement:

The plan sponsor is eligible for the automatic extension of amortization periods for multiemployer plans.

Question 27

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 28 (3 points)

Type of plan: Multiemployer.

Actuarial cost method: Unit credit.

Valuation date: 1/1/2015.

Annual normal retirement benefit: \$60 per month for each year of service, payable monthly.

Early retirement benefit: Accrued benefit reduced by 3% for each year prior to age 65.

Valuation interest rate: 6.0%.

Data for plan participant Smith:

Gender	Male
Date of birth	1/1/1952
Date of hire	1/1/1994
Date of retirement	12/31/2014

$\$X$ is the absolute value as of 1/1/2015 of the total gain or loss attributable to Smith's retirement.

Question 28

In what range is $\$X$?

- (A) Less than \$10,000
- (B) \$10,000 but less than \$15,000
- (C) \$15,000 but less than \$20,000
- (D) \$20,000 but less than \$25,000
- (E) \$25,000 or more

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Data for Question 29 (3 points)

Plan type: Multiemployer.

Asset valuation method (adopted 1/1/2005): Smoothed market value using a smoothing period of three years, as described in Rev. Proc. 2000-40.

Valuation interest rate: 7.0%.

Asset gain for 2013: \$3,000.

Selected asset information:

	<u>1/1/2014</u>	<u>1/1/2015</u>
Market value of assets	\$50,000	\$40,000
Benefit payments and expenses, paid on 7/1	1,500	
Contribution, paid 11/1	5,000	

Question 29

In what range is the actuarial value of assets as of 1/1/2015?

- (A) Less than \$35,000
- (B) \$35,000 but less than \$40,000
- (C) \$40,000 but less than \$45,000
- (D) \$45,000 but less than \$50,000
- (E) \$50,000 or more

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Data for Question 30 (4 points)

Valuation date: 1/1/2015.

Accrued benefit: 10% of final three-year average compensation multiplied by years of service.

Segment rates: { 1.7%, 4.3%, 5.5% }.

Adjusted segment rates: { 5.0%, 6.0%, 7.0% }.

Actuarial (market) value of plan assets: \$200,000.

Compensation increase assumption: 0% per year.

Data for sole participant Smith:

Date of birth	1/1/1970
Date of hire	1/1/2012
2012 compensation	\$100,000
2013 compensation	150,000
2014 compensation	175,000

Selected annuity factors:

	<u>5.5%</u>	<u>7.0%</u>
$\ddot{a}_{65}^{(12)}$	11.35	10.11

$\$X$ is equal to the deduction limit as of 1/1/2015.

Question 30

In what range is $\$X$?

- (A) Less than \$75,000
- (B) \$75,000 but less than \$105,000
- (C) \$105,000 but less than \$135,000
- (D) \$135,000 but less than \$165,000
- (E) \$165,000 or more

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Data for Question 31 (2 points)

Consider the following statements with respect to a waiver of the minimum required contribution for the 2014 plan year:

- I. The amortization period is 5 years beginning with the 2015 plan year.
- II. The interest rate used to determine the waiver amortization installments is the effective interest rate for the 2014 plan year.
- III. If the funding shortfall is zero for a plan year after the 2014 plan year, the waiver amortization bases and installments are reduced to zero.

Question 31

Which, if any, of the above statements 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.

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Data for Question 32 (1 point)

Valuation date: 1/1/2015.

Normal retirement benefit: \$48 per month for each year of service.

The plan sponsor adopts an amendment on 11/15/2014 to increase the benefit rate to \$60 per month for service completed after 5/31/2015, effective 6/1/2015.

No action is required under the provisions of IRC section 436 for the amendment to take effect.

Consider the following statement:

The amendment must be reflected in the 1/1/2015 target normal cost.

Question 32

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 33 (3 points)

Selected valuation results:

	<u>1/1/2014</u>	<u>1/1/2015</u>
Minimum required contribution	\$500,000	\$600,000
Effective interest rate	7.0%	6.0%
Funding shortfall	Yes	No
Funding balances	None	None

A 2015 plan year contribution of \$50,000 was made on 2/15/2015.

$\$X$ is the smallest amount necessary to satisfy the first quarterly contribution installment on 4/15/2015.

Question 33

In what range is $\$X$?

- (A) Less than \$74,000
- (B) \$74,000 but less than \$74,500
- (C) \$74,500 but less than \$75,000
- (D) \$75,000 but less than \$75,500
- (E) \$75,500 or more

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Data for Question 34 (4 points)

Valuation date: 1/1/2015.

Segment rates for 2014: {4.0%, 5.0%, 6.0% }.

Segment rates for 2015: {3.0%, 4.0%, 5.0% }.

Selected information as of 1/1/2015:

Actuarial (market) value of assets	\$1,500,000
Funding target	1,900,000
Target normal cost	100,000
Funding balances	None

Data for existing funding waivers:

	<u>Year for which Funding Waiver was Granted</u>	
	<u>2013</u>	<u>2014</u>
Funding waiver amount	\$200,000	\$100,000
Funding waiver installment	44,000	22,658

No funding waiver was granted to the plan sponsor before the 2013 plan year. There are no shortfall amortization bases for 2014 or earlier plan years.

$\$X$ is the maximum funding waiver as of 1/1/2015 permitted under IRC section 412(c) for 2015.

Question 34

In what range is $\$X$?

- (A) Less than \$120,000
- (B) \$120,000 but less than \$124,000
- (C) \$124,000 but less than \$128,000
- (D) \$128,000 but less than \$132,000
- (E) \$132,000 or more

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Data for Question 35 (1 point)

Consider the following statement:

The plan actuary should consider the plan's definition of what constitutes a disability (for example, Social Security disability benefit eligibility) in setting a disability incidence assumption for funding purposes.

Question 35

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 36 (1 point)

Consider the following statement related to IRC section 4971 taxes for failure to meet minimum funding standards:

Only the employer responsible for contributing to or under the plan, not other controlled group members, is liable for the tax.

Question 36

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 37 (4 points)

Valuation date: 1/1/2015.

Type of plan: Multiemployer.

Asset valuation method adopted 1/1/2005: Smoothed market value using a smoothing period of five years, as described in Rev. Proc. 2000-40.

Selected asset information:

Asset (gain)/loss amounts:

During 2013	\$59,000
During 2012	33,000
During 2011	19,000

	<u>1/1/2014</u>	<u>1/1/2015</u>
Market value of assets	\$620,000	\$635,000
Actuarial value of assets	650,000	

Assumed rate of return for 2014: 6.0%.

Contribution paid on 8/1/2014 for the 2014 plan year: \$55,000.

Benefit payments and expenses paid uniformly throughout 2014: \$80,000.

Question 37

In what range is the actuarial value of assets as of 1/1/2015?

- (A) Less than \$610,000
- (B) \$610,000 but less than \$635,000
- (C) \$635,000 but less than \$660,000
- (D) \$660,000 but less than \$685,000
- (E) \$685,000 or more

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Data for Question 38 (1 point)

Type of plan: Multiemployer.

The plan is in endangered status at 1/1/2014.

Consider the following statement:

The plan sponsor must adopt and implement a rehabilitation plan.

Question 38

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 39 (3 points)

Type of plan: Multiemployer.

Actuarial cost method: Frozen initial liability.

Interest rate: 7.0%.

Credit balance as of 12/31/2014: \$0.

Selected information as of 1/1/2015:

Unfunded accrued liability	\$34,000
Actuarial (market) value of assets	261,000

Data for all participants as of 1/1/2015:

	<u>Smith</u>	<u>Jones</u>	<u>Brown</u>
Status	Active	Active	Retired
Age	50	60	65
Projected monthly benefit at normal retirement	\$2,500	\$3,500	\$1,250

The plan's formula is unrelated to compensation.

Selected annuity factor:

$$\ddot{a}_{65}^{(12)} = 10.11$$

Question 39

In what range is the normal cost as of 1/1/2015?

- (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

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Data for Question 40 (1 point)

Plan freeze date: 1/1/2007.

Current AFTAP: 75.00%.

The plan provides a Social Security level income option.

Consider the following statement:

Valuations should not reflect an assumption that Social Security level income options will be elected until the AFTAP for that year is at least 80%.

Question 40

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 41 (1 point)

A plan sponsor makes an election on March 1, 2015 to use funding balance to meet quarterly required contributions and offset the minimum required contribution for the 2015 plan year. On June 1, 2015 a deemed reduction reduces the funding balance for 2015.

Consider the following statement:

The deemed reduction reduces the funding balance available to be applied to the 2015 minimum required contribution and may result in a late April 15, 2015 quarterly.

Question 41

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 42 (1 point)

Consider the following statement with regard to a plan sponsor who fails to make the minimum required contribution to a defined benefit plan within 8½ months after the close of the plan year:

A tax is imposed equal to 10% of the aggregate unpaid minimum required contributions as of the end of the plan year adjusted with interest at the plan's effective interest rate to the last date for making the minimum required contribution for the plan year.

Question 42

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 43 (5 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2015.

Normal retirement benefit: 50% of final compensation.

Actuarial cost method: Entry age normal.

Valuation interest rate: 7.0%.

Assumed compensation increase: 3.0% per year.

Selected information for participant Smith:

Date of birth	1/1/1965
Date of hire	1/1/2000
2014 compensation	\$50,000

Selected annuity factor:

$$\ddot{a}_{65}^{(12)} = 10.11$$

Question 43

In what range is Smith's accrued liability as of 1/1/2015?

- (A) Less than \$85,000
- (B) \$85,000 but less than \$90,000
- (C) \$90,000 but less than \$95,000
- (D) \$95,000 but less than \$100,000
- (E) \$100,000 or more

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Data for Question 44 (3 points)

Valuation date: 1/1/2015.

Selected information as of 1/1/2015:

Actuarial (market) value of assets	\$5,000,000
Minimum required contribution	900,000
Effective interest rate	5.0%
Valuation results calculated for IRC 404 purposes	
Funding target	7,000,000
Target normal cost	600,000
Funding target with future compensation increases	10,000,000
At-risk funding target	9,000,000
At-risk target normal cost	800,000
At-risk funding target with future compensation increases	11,000,000

The plan is not at-risk for 2015 and has always had over 500 participants.

Question 44

In what range is the deduction limit for 2015?

- (A) Less than \$9,000,000
- (B) \$9,000,000 but less than \$9,650,000
- (C) \$9,650,000 but less than \$10,300,000
- (D) \$10,300,000 but less than \$10,950,000
- (E) \$10,950,000 or more

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Data for Question 45 (4 points)

Valuation date: 1/1/2015.

Type of plan: Statutory hybrid (cash balance).

Annual compensation credit: \$50,000, provided on the last day of each plan year.

Interest crediting rate: Actual rate of return on plan assets on the beginning of year balance.

Segment rates: {5.0%, 6.0%, 7.0% }.

Interest crediting rate assumption:

Prior to 1/1/2015	0.0%
On and after 1/1/2015	4.0%

Assumed form of payment: Lump sum.

Historical rate of return on plan assets:

2012	(10)%
2013	(12)%
2014	0%

Data for participant Smith:

Date of birth	1/1/1955
Date of hire	1/1/2012

$\$X$ is the change in the 1/1/2015 funding target for Smith due to the assumption change.

Question 45

In what range is $\$X$?

- (A) Less than \$19,000
- (B) \$19,000 but less than \$21,000
- (C) \$21,000 but less than \$23,000
- (D) \$23,000 but less than \$25,000
- (E) \$25,000 or more

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Data for Question 46 (1 point)

A plan provides a post-retirement death benefit of \$200 per year of service.

Consider the following statement:

The 1/1/2015 funding target for the death benefit is determined based on a death benefit of \$200 multiplied by a participant's years of service as of 1/1/2015.

Question 46

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 47 (3 points)

Type of plan: Multiemployer.

Actuarial cost method: Aggregate.

Valuation interest rate: 7.0%.

Credit balance at 12/31/2014: \$20,000.

Selected information as of 1/1/2015:

Actuarial (market) value of assets	\$2,530,000
Present value of future benefits	3,930,000
Present value of future compensation	4,770,000
Total compensation for all employees	540,000

$\$X$ is the **smallest amount that satisfies the minimum funding standard** as of 12/31/2015.

Question 47

In what range is $\$X$?

- (A) Less than \$140,000
- (B) \$140,000 but less than \$150,000
- (C) \$150,000 but less than \$160,000
- (D) \$160,000 but less than \$170,000
- (E) \$170,000 or more

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Data for Question 48 (5 points)

Type of Plan: Multiemployer.

Normal retirement benefit: 2% of final compensation per year of service.

Actuarial cost method: Aggregate.

Credit balance at 12/31/2013: \$0.

Selected information as of 1/1/2014:

Actuarial (market) value of assets	\$10,000,000
Present value of future benefits	30,000,000
Present value of future compensation	200,000,000
Expected total compensation for 2014	10,000,000
Valuation interest rate	7.0%
Compensation increase assumption	6.0% per year

All participants are active and under age 50. There were no new entrants during 2014.

The contribution for 2014 was the normal cost paid at 1/1/2014.

Plan experience was as assumed for 2014 except salaries, which increased by 10%.

$\$X$ is the contribution in the **smallest amount that satisfies the minimum funding standard** as of 12/31/2015, if all assumptions had been met.

$\$Y$ is the contribution in the **smallest amount that satisfies the minimum funding standard** as of 12/31/2015, based on actual plan experience.

Question 48

In what range is $|\$X - \$Y|$?

- (A) Less than \$45,000
- (B) \$45,000 but less than \$55,000
- (C) \$55,000 but less than \$65,000
- (D) \$65,000 but less than \$75,000
- (E) \$75,000 or more

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Data for Question 49 (4 points)

Valuation date: 1/1/2015.

Effective interest rate: 7.0%.

Funding target attainment percentage for the 2015 plan year: 90%.

Required quarterly installment due 4/15/2015: \$300,000.

Contribution paid on 2/1/2015 in the form of liquid assets: \$250,000.

Value of the plan's liquid assets as of 3/31/2015 (prior to adjustment): \$900,000.

Disbursements paid from the trust over the past 12 months ending 3/31/2015:

Payments for monthly benefits	\$265,000
Payments for administrative expenses	22,000
Payments for lump sums	250,000
Purchase of annuities	200,000

The plan had more than 100 participants on each day during 2014.

$\$X$ is the liquidity shortfall as of 3/31/2015.

Question 49

In what range is $\$X$?

- (A) Less than \$35,000
- (B) \$35,000 but less than \$70,000
- (C) \$70,000 but less than \$105,000
- (D) \$105,000 but less than \$140,000
- (E) \$140,000 or more

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Data for Question 50 (4 points)

Type of plan: Multiemployer.

Actuarial cost method: Entry age normal.

Valuation interest rate: 7.00%.

Credit balance as of 12/31/2013: \$1,000,000.

Selected information:

Plan year beginning	<u>1/1/2014</u>	<u>1/1/2015</u>
Actuarial (market) value of assets	\$6,250,000	\$6,280,000
Accrued liability	7,000,000	7,000,000
Normal cost	350,000	375,000
Amortization of outstanding charge bases established on or before 1/1/2014	500,000	475,000
Amortization of outstanding credit bases established on or before 1/1/2014	100,000	80,000

A single contribution of \$300,000 is made on 12/31/2014 for the 2014 plan year.

A single contribution of **\$X** is made on 12/31/2015 in the **smallest amount that satisfies the minimum funding standard** for the 2015 plan year.

Question 50

In what range is **\$X**?

- (A) Less than \$190,000
- (B) \$190,000 but less than \$200,000
- (C) \$200,000 but less than \$210,000
- (D) \$210,000 but less than \$220,000
- (E) \$220,000 or more

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Data for Question 51 (3 points)

Valuation date: 1/1/2014.

Plan effective date: 1/1/2009.

Benefit formula: 10% of high three-year average compensation per year of service.

Segment rates: {5.5%, 6.5%, 7.5% }.

Selected data for participant Smith:

Date of birth	1/1/1970
Date of hire	1/1/2007
High three-year average compensation	\$200,000

Selected annuity factors at age 65:

	<u>5.5%</u>	<u>6.5%</u>	<u>7.5%</u>
$\ddot{a}_{65}^{(12)}$	11.41	10.54	9.79

$\$X$ is the funding target for Smith as of 1/1/2014.

Question 51

In what range is $\$X$?

- (A) Less than \$220,000
- (B) \$220,000 but less than \$255,000
- (C) \$255,000 but less than \$290,000
- (D) \$290,000 but less than \$325,000
- (E) \$325,000 or more

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Data for Question 52 (4 points)

Type of plan: Multiemployer.

Valuation date: 10/1/2014.

Actuarial cost method: Unit credit.

Valuation interest rate: 7.0%.

Credit balance as of 9/30/2013: \$820,000.

Selected information:

	<u>10/1/2013</u>	<u>10/1/2014</u>
Actuarial (market) value of assets	\$5,750,000	\$4,700,000
Accrued liability	6,070,000	6,750,000
Normal cost	450,000	450,000
Amortization of outstanding base	525,000	
Contribution made on 9/30/2014	565,000	

All bases were combined and offset as of 10/1/2013, including bases established as of 10/1/2013.

A single contribution $\$X$ is made on 9/30/2015 for the plan year ending 9/30/2015 in the **smallest amount that satisfies the minimum funding standard** for that year.

Question 52

In what range is $\$X$?

- (A) Less than \$600,000
- (B) \$600,000 but less than \$671,500
- (C) \$671,500 but less than \$743,000
- (D) \$743,000 but less than \$814,500
- (E) \$814,500 or more

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Data for Question 53 (3 points)

Funding standard carryover balance as of 1/1/2014: \$50,000.

Prefunding balance as of 1/1/2014: \$0.

Effective interest rate for 2014: 6.00%.

Actual rate of return on assets for 2014: 4.00%.

Minimum required contribution for 2014: \$150,000.

No quarterly installments are required for the 2014 plan year.

The plan sponsor elects to apply \$20,000 of the funding standard carryover balance as of 1/1/2014 to offset the minimum required contribution for 2014 on 7/1/2014.

The plan sponsor contributes \$200,000 on 7/1/2014 allocated toward the remaining minimum required contribution for 2014.

$\$X$ is the maximum prefunding balance as of 1/1/2015.

Question 53

In what range is $\$X$?

- (A) Less than \$66,250
- (B) \$66,250 but less than \$66,750
- (C) \$66,750 but less than \$67,250
- (D) \$67,250 but less than \$67,750
- (E) \$67,750 or more

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Data for Question 54 (4 points)

Valuation date: 1/1/2015.

Annual normal retirement benefit: \$1,200 per year of service, payable monthly.

Early retirement eligibility: Age 55.

Early retirement reduction: 4% per year prior to age 65.

Selected data for participant Smith:

Date of birth	1/1/1951
Date of hire	1/1/2005
Date of retirement	12/31/2014
Elected form of annuity	Ten-year certain only

Selected annuity factors:

	$\ddot{a}_{64}^{(12)}$	$\overline{ \ddot{a}}^{(12)}$
Plan assumptions	10.30	7.30
Funding assumptions	11.50	7.69

$\$X$ is the funding target as of 1/1/2015 assuming a single life annuity form of payment.

$\$Y$ is the funding target as of 1/1/2015 given the form of payment elected.

Question 54

In what range is $|\$X - \$Y|$?

- (A) Less than \$2,500
- (B) \$2,500 but less than \$5,000
- (C) \$5,000 but less than \$7,500
- (D) \$7,500 but less than \$10,000
- (E) \$10,000 or more

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Data for Question 55 (3 points)

Valuation date: 1/1/2015.

Normal retirement benefit: 1.5% times final-year compensation times years of service.

Segment rates for the 2014 and 2015 valuations: {5.5%, 6.5%, 7.5% }.

Compensation increase assumption: 3% per year.

Selected data for sole participant Smith:

Date of birth	1/1/1972
Date of hire	1/1/1998
2013 compensation	\$50,000
2014 compensation	75,000

Selected age 65 annuity factors for 2015:

<u>5.5%</u>	<u>6.5%</u>	<u>7.5%</u>
11.41	10.54	9.79

$\$X$ = 1/1/2015 funding target.

$\$Y$ = 1/1/2015 funding target calculated as if the actual 2014 compensation was equal to the expected compensation at 1/1/2014.

Question 55

In what range is $|\$X - \$Y|$?

- (A) Less than \$10,500
- (B) \$10,500 but less than \$12,500
- (C) \$12,500 but less than \$14,500
- (D) \$14,500 but less than \$16,500
- (E) \$16,500 or more

****END OF EXAMINATION****

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