

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 3, 2015

Time: 8:30 a.m. – 12:30 p.m.

## INSTRUCTIONS TO CANDIDATES

- Write your candidate number here \_\_\_\_\_. Your name must not appear.
  - Do not break the seal of this book until the supervisor tells you to do so.
  - Special conditions generally applicable to all questions on this examination are found at the front of this book.
  - All questions should be answered in accordance with laws, rules and regulations in effect as of May 31, 2015.
  - This examination consists of 57 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.
  - 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.
  - 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.
  - 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.
  - 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.
  - Do not spend too much time on any one question. If a question seems too difficult, leave it and go on.
  - 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.
  - Clearly indicated answer choices in the test book can be an aid in grading examinations in the unlikely event of a lost answer sheet.
  - Use the blank portions of each page for your scratch work. Extra blank pages are provided at the back of the examination book.
  - 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:
    - Name  
(include last name, first name and middle initial)
    - Candidate Number  
(Candidate/Eligibility Number, use leading zeros if needed to make it a five digit number)
    - Test Site Code  
(the supervisor will supply the number)
    - Examination Part  
(code the examination that you are taking by blackening the circle to the left of "Course EA-2, Segment F")
    - 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.)
- In box titled "Complete this section only if instructed to do so", fill in the circle to indicate if you are using a calculator and write in the make and model number.
- In the box titled "Signature and Date" sign your name and write today's date. **If the answer sheet is not signed, it will not be graded.**
- Leave the boxes titled "Test Code" and "Form Code" blank.
- On the back of the answer sheet fill in the Booklet Number in the space provided.
- 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 2015**  
**January 11, 2016**

<b>Question</b>	<b>Answer</b>		<b>Question</b>	<b>Answer</b>
<b>1</b>	<b>B</b>		<b>31</b>	<b>B</b>
<b>2</b>	<b>D</b>		<b>32</b>	<b>C</b>
<b>3</b>	<b>D</b>		<b>33</b>	<b>C</b>
<b>4</b>	<b>D</b>		<b>34</b>	<b>B</b>
<b>5</b>	<b>D</b>		<b>35</b>	<b>B</b>
<b>6</b>	<b>C</b>		<b>36</b>	<b>D</b>
<b>7</b>	<b>D</b>		<b>37</b>	<b>A</b>
<b>8</b>	<b>E</b>		<b>38</b>	<b>E</b>
<b>9</b>	<b>A</b>		<b>39</b>	<b>B</b>
<b>10</b>	<b>A</b>		<b>40</b>	<b>C</b>
<b>11</b>	<b>A</b>		<b>41</b>	<b>B</b>
<b>12</b>	<b>B</b>		<b>42</b>	<b>B</b>
<b>13</b>	<b>B</b>		<b>43</b>	<b>B</b>
<b>14</b>	<b>B</b>		<b>44</b>	<b>A</b>
<b>15</b>	<b>A</b>		<b>45</b>	<b>C</b>
<b>16</b>	<b>D</b>		<b>46</b>	<b>D</b>
<b>17</b>	<b>A</b>		<b>47</b>	<b>C</b>
<b>18</b>	<b>B</b>		<b>48</b>	<b>C</b>
<b>19</b>	<b>B</b>		<b>49</b>	<b>A</b>
<b>20</b>	<b>D</b>		<b>50</b>	<b>B</b>
<b>21</b>	<b>A</b>		<b>51</b>	<b>D</b>
<b>22</b>	<b>B</b>		<b>52</b>	<b>C</b>
<b>23</b>	<b>A</b>		<b>53</b>	<b>B</b>
<b>24</b>	<b>A</b>		<b>54</b>	<b>C</b>
<b>25</b>	<b>B</b>		<b>55</b>	<b>A</b>
<b>26</b>	<b>C</b>		<b>56</b>	<b>D</b>
<b>27</b>	<b>D</b>		<b>57</b>	<b>B</b>
<b>28</b>	<b>D</b>			
<b>29</b>	<b>B</b>			
<b>30</b>	<b>B</b>			

Data for Question 1 (2 points)

A plan with 150 active participants has expected administrative expenses for 2016 of \$5,000 payable by the trust.

The plan bases benefits on average compensation and service.

Assumed compensation increases: 3.0% per year.

Consider the following plan amendments adopted before 1/1/2016 with respect to the plan:

- I. Plan amendment I freezes service used in the plan formula on 12/31/2015.
- II. Plan amendment II freezes average compensation recognized under the plan formula as of 12/31/2015.
- III. Plan amendment III freezes all benefit accruals on 12/31/2015.

Question 1

Based on which, if any, of the above plan amendments may the 2016 target normal cost be greater than \$5,000?

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

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Data for Question 2 (3 points)

Valuation date: 1/1/2016.

Prefunding balance as of 1/1/2016: \$0.

Selected valuation results:

	<u>1/1/2015</u>	<u>1/1/2016</u>
Minimum required contribution	\$525,000	\$550,000
Funding shortfall	10,000	

Effective interest rate for 2016: 6.0%.

The sole contribution for the 2016 plan year, made on 6/1/2016: \$600,000.

$\$X$  is the prefunding balance as of 1/1/2017.

Question 2

In what range is  $\$X$ ?

- (A) Less than \$34,500
- (B) \$34,500 but less than \$35,500
- (C) \$35,500 but less than \$36,500
- (D) \$36,500 but less than \$37,500
- (E) \$37,500 or more

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Data for Question 3 (3 points)

Type of plan: Multiemployer.

Annual normal retirement benefit: \$1,000 per year of service.

Actuarial cost method: Entry age normal.

Valuation interest rate: 7.0%.

Selected data for participant Smith:

Gender	Male
Date of birth	1/1/1955
Date of hire	1/1/2015

Question 3

In what range is the accrued liability for Smith as of 1/1/2016?

- (A) Less than \$8,000
- (B) \$8,000 but less than \$8,300
- (C) \$8,300 but less than \$8,600
- (D) \$8,600 but less than \$8,900
- (E) \$8,900 or more

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Data for Question 4 (4 points)

Type of plan: Multiemployer.

Credit balance as of 12/31/2015: \$25,000.

Valuation interest rate: 7.0%.

Normal cost as of 1/1/2016: \$200,000.

Amortization information as of 1/1/2016 for all bases established before 2016:

	<u>Years remaining</u>	<u>Outstanding balance</u>
Combined charge base	8	\$800,000
Experience gain	13	(300,000)
Experience loss	14	195,000

Experience loss for 2015 as of 1/1/2016: \$100,000.

The plan is amended on 12/31/2015 to pay each retired participant a one-time additional payment on 12/31/2016. This increases the plan's liability as of 1/1/2016 by \$30,000.

$\$X$  is the **smallest amount that satisfies the minimum funding standard** as of 12/31/2016.

Question 4

In what range is  $\$X$ ?

- (A) Less than \$300,000
- (B) \$300,000 but less than \$325,000
- (C) \$325,000 but less than \$350,000
- (D) \$350,000 but less than \$375,000
- (E) \$375,000 or more

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Data for Question 5 (3 points)

Type of plan: Multiemployer.

Plan effective date: 1/1/2010.

Actuarial cost method: Unit credit.

The plan was amended effective 1/1/2016.

Normal retirement benefit before amendment: \$25 per month for all years of service.

Normal retirement benefit after amendment: \$26 per month for all years of service.

Valuation interest rate: 6.0%.

Credit balance as of 12/31/2015: \$500.

Selected information as of 1/1/2016 (before amendment):

Actuarial (market) value of assets	\$985,000
Accrued liability for active participants	1,000,000
Accrued liability for inactive participants	0
Normal cost	35,000
Net amortization charges	1,000

**\$X** is the smallest amount that satisfies the minimum funding standard as of 12/31/2016.

Question 5

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

- (A) Less than \$40,500
- (B) \$40,500 but less than \$41,500
- (C) \$41,500 but less than \$42,500
- (D) \$42,500 but less than \$43,500
- (E) \$43,500 or more

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Data for Question 6 (4 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2016.

Actuarial cost method: Aggregate.

Credit balance as of 12/31/2015: \$50,000.

Valuation interest rate: 6.0%.

Selected information as of 1/1/2016:

Market value of assets	\$36,000,000
Actuarial value of assets	35,000,000
Present value of future benefits	45,000,000
Present value of expected 2016 compensation	2,500,000
Present value of expected future compensation	25,000,000

$\$X$  is the single contribution paid on 12/31/2016 in the **smallest amount that satisfies the minimum funding standard.**

Question 6

In what range is  $\$X$ ?

- (A) Less than \$950,000
- (B) \$950,000 but less than \$1,000,000
- (C) \$1,000,000 but less than \$1,050,000
- (D) \$1,050,000 but less than \$1,100,000
- (E) \$1,100,000 or more

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Data for Question 7 (5 points)

Type of plan: Multiemployer.

Normal retirement benefit: \$45 per month per year of service.

Actuarial cost method: Entry age normal.

No pre-retirement decrements other than death are assumed.

Valuation interest rate: 7.0%.

Selected data for participant Smith:

Date of birth	1/1/1955
Date of hire	1/1/2010

Selected commutation functions:

Age	$D_x$	$N_x^{(12)}$
55	23,710	290,227
61	15,356	168,534
65	11,394	115,172
70	7,638	67,909

For the 1/1/2016 valuation, the assumed retirement age for Smith changed from age 65 to age 70.

The plan suspends benefits and the plan sponsor timely provides a suspension of benefits notice.

As of 1/1/2016, Smith's accrued liability decreases by \$X due to the change in assumed retirement age.

Question 7

In what range is \$X?

- (A) Less than \$6,000
- (B) \$6,000 but less than \$7,000
- (C) \$7,000 but less than \$8,000
- (D) \$8,000 but less than \$9,000
- (E) \$9,000 or more

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Data for Question 8 (3 points)

The plan is not at-risk for 2016 and has always had over 500 participants.

Selected information as of 1/1/2016:

Market value of assets	\$875,000
Actuarial value of assets	800,000
Valuation results calculated for IRC 404 purposes	
Funding target	1,000,000
Target normal cost	80,000
Funding target with expected future compensation increases	1,200,000
At-risk funding target	1,300,000
At-risk target normal cost	90,000
Effective interest rate	4.50%

Question 8

In what range is the deduction limit for 2016?

- (A) Less than \$650,000
- (B) \$650,000 but less than \$750,000
- (C) \$750,000 but less than \$850,000
- (D) \$850,000 but less than \$950,000
- (E) \$950,000 or more

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Data for Question 9 (1 point)

The actuarial value of assets, as elected by the plan sponsor, is the average of the fair market value of assets on the valuation date and the adjusted fair market value of assets determined as of the preceding valuation date.

Consider the following statement:

The assumed earnings rate used for purposes of determining the actuarial value of assets is treated as an actuarial assumption rather than as part of the funding method.

Question 9

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 10 (1 point)

Consider the following statement regarding minimum funding for single employer plans:

In determining the funding balances for a plan year, the prior plan year's funding balances that were not applied to that prior plan year's minimum required contribution shall be adjusted to reflect the actual rate of return on plan assets for the prior plan year.

Question 10

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 11 (4 points)

Normal retirement benefit: 1% of the highest consecutive five-year average compensation per year of service.

Death benefit: Lump sum equal to the greater of the participant's annual accrued benefit at time of death or \$10,000.

No pre-retirement decrements other than death are assumed.

Deaths are assumed to occur at the beginning of the year.

Assumed compensation increases: 5.0% per year.

Selected data for participant Smith as of 1/1/2016:

Age	60
Service	10
Compensation for all prior years	\$60,000

$\$X$  is the death benefit used to determine the 2016 target normal cost with respect to death at age 64.

Question 11

In what range is  $\$X$ ?

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

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Data for Question 12 (3 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2016.

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

Market value of assets as of 1/1/2016: \$50,000,000.

Asset loss/(gain) amounts:

During 2011	\$2,100,000
During 2012	(7,250,000)
During 2013	(4,500,000)
During 2014	550,000
During 2015	(9,250,000)

Question 12

In what range is the actuarial value of assets as of 1/1/2016?

- (A) Less than \$39,800,000
- (B) \$39,800,000 but less than \$44,800,000
- (C) \$44,800,000 but less than \$49,800,000
- (D) \$49,800,000 but less than \$54,800,000
- (E) \$54,800,000 or more

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Data for Question 13 (4 points)

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

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

Assumed compensation increases: 3.0% per year.

Data for all participants as of 1/1/2016:

	<u>Smith</u>	<u>Jones</u>
Gender	Female	Female
Age	60	65
Status	Active	Retired
2015 compensation	\$50,000	
Service	10	
Annual benefit		\$10,000
Benefit form		Single life annuity

Question 13

In what range is the funding target as of 1/1/2016?

- (A) Less than \$193,000
- (B) \$193,000 but less than \$197,000
- (C) \$197,000 but less than \$201,000
- (D) \$201,000 but less than \$205,000
- (E) \$205,000 or more

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Data for Question 14 (3 points)

Type of plan: Multiemployer.

Plan effective date: 1/1/2007.

Actuarial cost method: Attained age normal.

Valuation interest rate: 6.0%.

Initial liability under unit credit method: \$70,000.

Initial liability under entry age normal method: \$80,000.

Selected information as of 1/1/2016:

Actuarial (market) value of assets	\$350,000
Present value of future benefits	815,000
Present value of expected 2016 compensation	175,000
Present value of expected future compensation	2,000,000
Normal cost	40,000

There have been no other amortization bases established since 1/1/2007.

Question 14

In what range is the credit balance as of 12/31/2015?

- (A) Less than \$40,000
- (B) \$40,000 but less than \$55,000
- (C) \$55,000 but less than \$70,000
- (D) \$70,000 but less than \$85,000
- (E) \$85,000 or more

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Data for Question 15 (1 point)

Type of plan: Multiemployer.

Actuarial cost method: Entry age normal.

Consider the following statement relative to this plan's deduction limit:

When determining the plan's full funding limitation, the funding method must be the same as the method used for minimum funding purposes under IRC section 431.

Question 15

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 16 (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 two valuation dates.

The actual market value return on assets for the 2014 plan year was \$70,000 less than the expected market value return for the 2014 plan year.

Selected information:

	<u>2015 plan year</u>	<u>2016 plan year</u>
Segment rates	{3.0%, 4.0%, 5.0% }	{4.0%, 5.0%, 6.0% }
Effective interest rate	4.5%	5.5%

Assumed rate of return on assets for 2015: 7.0%.

Benefit payments and expenses are assumed to be paid on the last day of the plan year.

Selected asset information excluding contributions receivable:

	<u>2015</u>	<u>2016</u>
Beginning of year market value of assets	\$3,500,000	\$3,825,000
Benefit payments	350,000	
Expenses	25,000	

Contributions for the 2015 plan year:

<u>Date</u>	<u>Amount</u>
4/30/2015	\$100,000
9/15/2016	350,000

Question 16

In what range is the actuarial value of assets as of 1/1/2016?

- (A) Less than \$3,885,000
- (B) \$3,885,000 but less than \$3,895,000
- (C) \$3,895,000 but less than \$3,905,000
- (D) \$3,905,000 but less than \$3,915,000
- (E) \$3,915,000 or more

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Data for Question 17 (1 point)

A plan sponsor applies for a waiver of the minimum funding requirement for the 2016 plan year.

The waiver application is sent to the Secretary of the Treasury on 4/1/2017.

Consider the following statement:

No waiver of the minimum funding requirement may be granted for 2016.

Question 17

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 18 (5 points)

A plan had more than 100 participants on each day during the preceding plan year.

Selected information:

	<u>1/1/2015</u>	<u>1/1/2016</u>
Prefunding balance	\$10,000	\$0
Actuarial (market) value of assets	420,000	445,000
Funding target	680,000	700,000
Minimum required contribution	96,000	120,000

Benefit payments and expenses paid from trust:

	<u>Expenses</u>	<u>Lump sum payments</u>	<u>Annuity payments</u>
From 1/1/2015 to 3/31/2015	\$900	\$2,000	\$15,000
From 4/1/2015 to 6/30/2015	700	5,000	27,000
From 7/1/2015 to 9/30/2015	1,300	6,000	29,000
From 10/1/2015 to 12/31/2015	4,000	6,000	31,000
<u>From 1/1/2016 to 3/31/2016</u>	<u>800</u>	<u>6,000</u>	<u>2,000</u>
Total 1/1/2015 to 3/31/2016	\$7,700	\$25,000	\$104,000

Benefits under the plan have been continuously frozen since 2002.

Annuities with a purchase price of \$200,000 were purchased between 10/1/2015 and 12/31/2015.

Value of the plan's liquid assets as of 3/31/2016: \$505,000.

**\$X** is the smallest amount that must be contributed for the 2016 plan year on 4/15/2016 to satisfy the quarterly contribution, including any liquidity shortfall.

Question 18

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

- (A) Less than \$25,000
- (B) \$25,000 but less than \$35,000
- (C) \$35,000 but less than \$45,000
- (D) \$45,000 but less than \$55,000
- (E) \$55,000 or more

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Data for Question 19 (1 point)

A plan is amended to provide that lump sums will be offered during a limited early retirement window.

Consider the following statement related to selection of actuarial assumptions for minimum funding purposes:

Only the probabilities of electing the available forms of payment should be considered during a review of assumptions.

Question 19

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 20 (4 points)

Type of plan: Multiemployer.

Credit balance as of 12/31/2015: \$1,350,000.

Valuation interest rate: 6.25%.

Selected information as of 1/1/2016:

Market value of assets	\$5,700,000
Actuarial value of assets	5,575,000
Actuarial accrued liability	10,300,000
Normal cost	150,000
Experience gain during 2015	95,000

Amortization information as of 1/1/2016 (excluding new 1/1/2016 amortization base):

Outstanding balance of amortization charges	\$7,490,000
Amortization charges	1,030,000
Outstanding balance of amortization credits	1,320,000
Amortization credits	150,000

A contribution of \$600,000 is paid on 9/1/2016 for the 2016 plan year.

Question 20

In what range is the credit balance as of 12/31/2016?

- (A) Less than \$932,500
- (B) \$932,500 but less than \$942,500
- (C) \$942,500 but less than \$952,500
- (D) \$952,500 but less than \$962,500
- (E) \$962,500 or more

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Data for Question 21 (1 point)

Plan year: 11/1 - 10/31.

Valuation date: 11/1/2016.

Valuation interest rate: 24-month average segment rates with no lookback.

Consider the following statement:

Under HATFA, the segment rates are adjusted using the 25-year average of the segment rates for the period ending 9/30/2015, as limited by the permissible corridor.

Question 21

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 22 (3 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2016.

Normal retirement benefit: 60% of final three-year average compensation reduced prorata for years of service less than 30 at normal retirement date.

Actuarial cost method: Projected unit credit.

Valuation interest rate: 6.0%.

Assumed compensation increases: 3.0% per year.

Data for participant Smith as of 1/1/2016:

Gender	Male
Age	55
Years of service	10
Compensation:	
Before 2015	\$100,000
2015	250,000

Assume that the IRC section 401(a)(17) compensation limit for 2016 is \$265,000.

Question 22

In what range is the actuarial accrued liability for Smith as of 1/1/2016?

- (A) Less than \$250,000
- (B) \$250,000 but less than \$350,000
- (C) \$350,000 but less than \$450,000
- (D) \$450,000 but less than \$550,000
- (E) \$550,000 or more

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Data for Question 23 (1 point)

Consider the following statement regarding minimum funding for single employer plans:

If the value of plan assets is less than the funding target for the plan year, the minimum required contribution for the plan year is the sum of any target normal cost, shortfall amortization charge and waiver amortization charge.

Question 23

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 24 (3 points)

Selected information for the 2016 plan year:

Funding standard carryover balance	\$25,000
Prefunding balance	520,000
Required quarterly installments	200,000
Effective interest rate	5.0%

On each quarterly due date, the plan sponsor elected to use funding balances to meet the quarterly requirements to the extent possible.

$\$X$  is the smallest contribution as of 10/15/2016 to satisfy the 10/15/2016 required quarterly installment.

Question 24

In what range is  $\$X$ ?

- (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 25 (1 point)

A plan has no funding balances as of the first day of the plan year.

$\$X$  is the minimum required contribution determined as of the first day of the plan year.

$\$Y$  is the contributions for the plan year that were actually deposited by the last day of the plan year, discounted at the effective interest rate to the first day of the plan year.

Consider the following statement:

A 10% excise tax is applied to the excess, if any, of  $\$X$  over  $\$Y$ .

Question 25

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 26 (3 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2016.

Actuarial cost method: Frozen initial liability.

There are no inactive participants.

Selected valuation results at 1/1/2016 (before plan amendment):

Present value of future benefits	\$500,000
Present value of future normal costs	200,000

The plan was amended on 12/20/2015, effective 1/1/2016, to increase benefits for all service by 10%.

Increase in entry age normal accrued liability at 1/1/2016 due to plan amendment: \$20,000.

$\$X$  is the present value of future normal costs after the plan amendment.

Question 26

In what range is  $\$X$ ?

- (A) Less than \$215,500
- (B) \$215,500 but less than \$225,500
- (C) \$225,500 but less than \$235,500
- (D) \$235,500 but less than \$245,500
- (E) \$245,500 or more

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Data for Question 27 (3 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2016.

Actuarial cost method: Entry age normal.

Valuation interest rate: 7.0%.

Credit balance as of 12/31/2015: \$19,000.

Selected valuation results at 1/1/2016:

Normal cost	\$26,000
Amortization charges	75,000
Amortization credits	40,000

Employer contributions for 2016 plan year:

<u>Date</u>	<u>Amount</u>
9/1/2016	\$51,000
1/15/2017	20,000

Question 27

In what range is the credit balance as of 12/31/2016?

- (A) Less than \$23,000
- (B) \$23,000 but less than \$25,000
- (C) \$25,000 but less than \$27,000
- (D) \$27,000 but less than \$29,000
- (E) \$29,000 or more

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Data for Question 28 (3 points)

Type of plan: Multiemployer.

Actuarial cost method: Unit credit.

Valuation date: 1/1/2016.

Valuation interest rate: 6.0%.

Selected data for retired participant Smith:

Gender	Male
Date of birth	1/1/1950
Date of retirement	1/1/2015
Date of death	12/31/2015
Monthly benefit	\$1,000
Form of annuity	10-year certain and life

Question 28

In what range is the gain as of 1/1/2016 due to Smith's death?

- (A) Less than \$40,000
- (B) \$40,000 but less than \$43,000
- (C) \$43,000 but less than \$46,000
- (D) \$46,000 but less than \$49,000
- (E) \$49,000 or more

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Data for Question 29 (3 points)

Type of plan: Multiemployer.

Normal retirement benefit: 1% of final three-year average compensation per year of service, limited to 30 years.

Actuarial cost method: Projected unit credit.

Selected assumptions:

Valuation interest rate	6.0%
Compensation increase	3.0% per year

Selected participant data for Smith:

Gender	Female
Date of birth	1/1/1958
Date of hire	1/1/1985
2015 compensation	\$60,000

$\$X$  is the actuarial accrued liability for Smith as of 1/1/2016.

$\$Y$  is the normal cost for Smith as of 1/1/2016.

Question 29

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

- (A) Less than \$160,000
- (B) \$160,000 but less than \$165,000
- (C) \$165,000 but less than \$170,000
- (D) \$170,000 but less than \$175,000
- (E) \$175,000 or more

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Data for Question 30 (4 points)

Funding standard carryover balance as of 1/1/2015: \$50,000.

Prefunding balance as of 1/1/2015: \$0.

Effective interest rate for 2015: 6.0%.

Actual rate of return on assets for 2015: 10.0%.

Minimum required contribution for 2015: \$250,000.

There are no required quarterly contributions for the 2015 plan year.

The plan sponsor elects on 1/1/2015 to apply \$20,000 of funding standard carryover balance to offset the minimum required contribution for 2015.

The plan sponsor contributes \$300,000 on 7/1/2016 for the 2015 plan year.

$\$X$  is the maximum permissible prefunding balance as of 1/1/2016.

$\$Y$  is the funding standard carryover balance as of 1/1/2016.

Question 30

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

- (A) Less than \$15,000
- (B) \$15,000 but less than \$15,500
- (C) \$15,500 but less than \$16,000
- (D) \$16,000 but less than \$16,500
- (E) \$16,500 or more

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Data for Question 31 (4 points)

Segment rates for 2016: {5.0%, 6.0%, 7.0% }.

At-risk status for plan years:

<u>Plan year</u>	<u>Status</u>
2012	Not at-risk
2013	Not at-risk
2014	Not at-risk
2015	At-risk
2016	At-risk

Selected information as of 1/1/2016:

Prefunding balance	\$0
Actuarial (market) value of assets	10,000,000
Funding target without regard to at-risk assumptions	15,000,000
Target normal cost without regard to at-risk assumptions	1,000,000
At-risk funding target	18,000,000
At-risk target normal cost	1,200,000
Number of participants	1,000

Information regarding shortfall amortization installments established prior to 1/1/2016 and not yet fully amortized:

Sum of installments	\$1,500,000
Present value of installments as of 1/1/2016	4,000,000

$\$X$  is the **minimum required contribution** for the 2016 plan year.

Question 31

In what range is  $\$X$ ?

- (A) Less than \$2,750,000
- (B) \$2,750,000 but less than \$3,000,000
- (C) \$3,000,000 but less than \$3,250,000
- (D) \$3,250,000 but less than \$3,500,000
- (E) \$3,500,000 or more

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Data for Question 32 (2 points)

Early retirement eligibility: Age 55.

Selected active participant data:

	<u>Date of Birth</u>
Smith	1/1/1962
Jones	1/1/1967
Brown	1/1/1972
Green	1/1/1977

Question 32

In determining the at-risk funding target for the 2016 plan year, how many of the above participants are assumed to retire at age 55?

- (A) 0
- (B) 1
- (C) 2
- (D) 3
- (E) 4

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Data for Question 33 (4 points)

Plan effective date: 1/1/2011.

Valuation date: 1/1/2015.

Accrued benefit: 9% of highest five-year average compensation per year of service.

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

Selected data for participant Smith:

Gender	Male
Date of birth	1/1/1978
Date of hire	1/1/2008

<u>Year</u>	<u>Compensation</u>
Before 2011	\$100,000
2011	300,000
2012	100,000
2013	100,000
2014	300,000

Selected annuity values:

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

Question 33

In what range is the 2015 funding target for Smith?

- (A) Less than \$100,000
- (B) \$100,000 but less than \$125,000
- (C) \$125,000 but less than \$150,000
- (D) \$150,000 but less than \$175,000
- (E) \$175,000 or more

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Data for Question 34 (3 points)

Selected information as of 1/1/2015:

Minimum required contribution	\$40,000
Effective interest rate	4.0%
Segment rates	{ 3.0%, 4.0%, 5.0% }

There were no quarterly contribution requirements for 2015.

Segment rates for 2016: { 5.0%, 6.0%, 7.0% }.

The sole contribution for the 2015 plan year, made on 12/31/2015: \$20,000.

The plan received a waiver for the 2015 unpaid minimum required contribution.

$\$X$  is the waiver amortization installment as of 1/1/2016.

Question 34

In what range is  $\$X$ ?

- (A) Less than \$4,475
- (B) \$4,475 but less than \$4,625
- (C) \$4,625 but less than \$4,775
- (D) \$4,775 but less than \$4,925
- (E) \$4,925 or more

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Data for Question 35 (4 points)

Type of plan: Multiemployer.

Plan effective date: 1/1/1970.

Actuarial cost method: Unit credit.

Valuation date: 1/1/2016

Valuation interest rate: 8.0%.

Credit balance as of 12/31/2015: \$50,000.

Selected information as of 1/1/2016:

Market value of assets	\$2,590,000
Actuarial value of assets	3,090,000
Accrued liability	3,720,000
Normal cost	40,000

Amortization information as of 1/1/2016, not including an experience loss of \$80,000 for the plan during 2015:

	<u>Outstanding balance</u>	<u>Amortization amount</u>
Charge bases	\$1,650,000	\$160,000
Credit bases	1,050,000	100,000

A single contribution of \$X is made on 1/1/2016 in the smallest amount that satisfies the minimum funding standard.

Question 35

In what range is \$X?

- (A) Less than \$57,000
- (B) \$57,000 but less than \$59,000
- (C) \$59,000 but less than \$61,000
- (D) \$61,000 but less than \$63,000
- (E) \$63,000 or more

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Data for Question 36 (3 points)

Selected valuation results:

	<u>2014</u>	<u>2015</u>
Minimum required contribution	\$750,000	\$850,000
Effective interest rate	7.0%	4.0%
Required quarterly installments	None	None

A contribution of \$750,000 is made on 12/31/2014.

A contribution of \$750,000 is made on 7/1/2016 and applied to the 2015 plan year to the extent allowable.

No other contributions are made between 1/1/2014 and 9/15/2016.

$\$X$  is the excise tax due attributable to any unpaid minimum required contribution for the 2015 plan year.

Question 36

In what range is  $\$X$ ?

- (A) Less than \$19,200
- (B) \$19,200 but less than \$19,400
- (C) \$19,400 but less than \$19,600
- (D) \$19,600 but less than \$19,800
- (E) \$19,800 or more

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Data for Question 37 (4 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2016.

Normal retirement benefit: \$200 per month per year of service (up to a maximum of 20 years of service).

Pre-retirement death benefit: \$300,000 lump sum payment payable at the end of the year of death.

Actuarial cost method: Aggregate.

Valuation interest rate: 6.0%.

No pre-retirement decrements other than death are assumed.

	<u>Age 62</u>	<u>Age 63</u>	<u>Age 64</u>
Probability of death, decrement at end of year	0.0063	0.0075	0.0084

Selected data for participant Smith:

Gender	Male
Date of birth	1/1/1954
Date of hire	1/1/1986

Question 37

In what range is the present value of future benefits for Smith as of 1/1/2016?

- (A) Less than \$436,000
- (B) \$436,000 but less than \$437,000
- (C) \$437,000 but less than \$438,000
- (D) \$438,000 but less than \$439,000
- (E) \$439,000 or more

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Data for Question 38 (3 points)

Type of plan: Multiemployer.

Actuarial cost method: Entry age normal.

Valuation interest rate: 6.0%.

Credit balance as of 12/31/2015: \$500,000.

Normal cost for the 2016 plan year as of 1/1/2016: \$300,000.

Total amortization payments as of 1/1/2016 for all funding standard account bases established prior to 1/1/2016:

Charge base amortization payment total	\$30,000
Credit base amortization payment total	5,000

There was an experience gain of \$110,000 during 2015.

There are no contributions for the 2016 plan year.

Question 38

In what range is the 12/31/2016 credit balance?

- (A) Less than \$165,000
- (B) \$165,000 but less than \$175,000
- (C) \$175,000 but less than \$185,000
- (D) \$185,000 but less than \$195,000
- (E) \$195,000 or more

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Data for Question 39 (4 points)

Type of plan: Multiemployer.

Normal retirement benefit: 2.5% of highest year of compensation per year of service.

Actuarial cost method: Entry age normal.

Valuation interest rate: 7.0%.

Assumed compensation increases: 4.0% per year.

Selected data for participant Smith:

Date of birth	1/1/1959
Date of hire	1/1/2014
2014 compensation	\$67,300
2015 compensation	70,000

Selected annuity value:  $\ddot{a}_{65}^{(12)} = 12.41$ .

Question 39

In what range is the normal cost for Smith as of 1/1/2016?

- (A) Less than \$18,000
- (B) \$18,000 but less than \$19,000
- (C) \$19,000 but less than \$20,000
- (D) \$20,000 but less than \$21,000
- (E) \$21,000 or more

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Data for Question 40 (2 points)

Selected interest rates for 2016 plan year:

IRC section 430 24-month average for the 3<sup>rd</sup> segment rate: 5.00%

25-year average interest rate for stabilization under HATFA:

Segment 1	5.50%
Segment 2	7.00%
Segment 3	7.75%

Selected interest rates for 2021 plan year:

IRC section 430 24-month average for the 3<sup>rd</sup> segment rate: 5.00%

25-year average interest rate for stabilization under HATFA:

Segment 1	5.00%
Segment 2	6.50%
Segment 3	7.00%

$X\%$  is the difference between the 3<sup>rd</sup> segment rates used for minimum funding for the 2016 and 2021 plan years.

Question 40

In what range is  $|X\%|$ ?

- (A) Less than 1.60%
- (B) 1.60% but less than 1.80%
- (C) 1.80% but less than 2.00%
- (D) 2.00% but less than 2.20%
- (E) 2.20% or more

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Data for Question 41 (4 points)

Type of plan: Hybrid (cash balance).

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

Interest crediting rate: 4.0%, credited at the end of the year on the beginning of year balance.

Assumed form of payment: Single life annuity.

Selected data for participant Smith as of 1/1/2016:

Gender	Male
Date of birth	1/1/1956
Hypothetical account balance	\$100,000

Age 65 single life annuity value per plan's fixed actuarial equivalence basis: 12.21.

Question 41

In what range is the funding target for Smith as of 1/1/2016?

- (A) Less than \$73,000
- (B) \$73,000 but less than \$82,000
- (C) \$82,000 but less than \$91,000
- (D) \$91,000 but less than \$100,000
- (E) \$100,000 or more

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Data for Question 42 (1 point)

A plan sponsor switches actuarial consulting firms.

Consider the following statement related to selection of actuarial assumptions for minimum funding purposes:

Before the new Enrolled Actuary can sign the Form 5500 Schedule SB, the new Enrolled Actuary must perform an experience study to review all assumptions employed by the prior actuary.

Question 42

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 43 (1 point)

A multiemployer plan receives a payment for an employer's withdrawal liability.

Consider the following statement:

For purposes of the plan's funding standard account, this amount is not considered an employer contribution.

Question 43

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 44 (1 point)

Consider the following statement:

If there was no funding shortfall in 2015, there is no liquidity requirement for 2016.

Question 44

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 45 (2 points)

The plan actuary considers changing the mortality assumption used to determine the 1/1/2015 funding target.

The plan has a total of 2,425 participants.

Consider the following choices for the mortality assumption:

- I. The prescribed static mortality table for the valuation year, with combined annuitant/nonannuitant rates.
- II. The prescribed mortality table as of the base year, with generational projection using Projection Scale AA and with separate rates for annuitants and nonannuitants.
- III. A static plan-specific substitute mortality table based on the plan's actual experience.

Question 45

Which, if any, of the above mortality assumptions would be permitted?

- (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 46 (4 points)

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

Selected information as of:

	<u>1/1/2014</u>	<u>1/1/2015</u>	<u>1/1/2016</u>
Prefunding balance			\$500
Actuarial (market) value of assets			10,000
Funding target			12,900
Target normal cost	\$150	\$200	250
Minimum required contribution	350	500	

The plan was exempt from establishing a shortfall amortization base in all plan years before 2014.

Question 46

In what range is the minimum required contribution for 2016?

- (A) Less than \$790
- (B) \$790 but less than \$820
- (C) \$820 but less than \$850
- (D) \$850 but less than \$880
- (E) \$880 or more

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Data for Question 47 (4 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2016.

Actuarial cost method: Unit credit.

Credit balance as of 12/31/2014: \$50,000.

Valuation interest rate: 7.5%.

Normal cost as of 1/1/2015: \$500,000.

Combined charge base excluding 2014 experience:

<u>Years remaining</u>	<u>Amortization amount</u>
8	\$200,000

There are no credit bases.

Amortization amount for experience loss during 2014: \$80,000

The sole contribution for the 2015 plan year, made on 12/31/2015: \$50,000.

A funding waiver for 2015 was granted to avoid any funding deficiency.

Selected information as of 1/1/2016:

Normal cost	\$475,000
Experience loss during 2015	50,000

**\$X** is the smallest amount that satisfies the minimum funding standard as of 1/1/2016.

Question 47

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

- (A) Less than \$550,000
- (B) \$550,000 but less than \$700,000
- (C) \$700,000 but less than \$850,000
- (D) \$850,000 but less than \$1,000,000
- (E) \$1,000,000 or more

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Data for Question 48 (4 points)

Type of plan: Multiemployer.

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

Selected asset information:

	<u>1/1/2015</u>	<u>1/1/2016</u>
Market value of assets	\$186,000	\$207,000
Actuarial value of assets	200,000	

Assumed rate of return on assets for 2015: 7.5%.

The sole contribution for the 2015 plan year, made on 4/1/2015: \$20,000.

Benefit payments paid on 7/1/2015: \$21,500.

Asset loss/(gain) amounts:

<u>During plan year</u>	<u>Loss/(gain)</u>
2012	\$10,000
2013	5,000
2014	20,000

Question 48

In what range is the actuarial value of assets as of 1/1/2016?

- (A) Less than \$201,000
- (B) \$201,000 but less than \$209,000
- (C) \$209,000 but less than \$217,000
- (D) \$217,000 but less than \$225,000
- (E) \$225,000 or more

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Data for Question 49 (1 point)

A single employer plan has received waivers of the minimum funding requirements for 2000, 2006, and 2011.

Consider the following statement:

It is possible for this plan to receive a waiver of the minimum required contribution for 2016.

Question 49

Is the above statement true or false?

- (A) True
- (B) False

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Data for Question 50 (2 points)

Type of plan: Multiemployer.

Valuation date: 10/1/2015.

The required contribution rate under the collective bargaining agreement is \$2.20 per hour.

Employer A was required to contribute for 700,000 hours for the plan year ending 9/30/2016.

The plan first entered critical status as of 10/1/2014 and remained in critical status as of 10/1/2015.

On 12/31/2016, Employer A adopts a collective bargaining agreement consistent with the terms of a schedule in the rehabilitation plan.

Consider the following statement:

The surcharge for Employer A is \$77,000 for the plan year ending 9/30/2016.

Question 50

Is the above statement true or false?

(A) True

(B) False

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Data for Question 51 (3 points)

Funding standard carryover balance as of 1/1/2015: \$300,000.

Prefunding balance as of 1/1/2015: \$300,000.

Selected results as of 1/1/2015:

Target normal cost	\$425,000
Shortfall amortization charge	75,000
Effective interest rate	6.0%

Rate of return on assets during 2015: 20.0%.

The plan sponsor contributes the **smallest amount that satisfies the minimum funding standard** on 12/31/2015.

**\$X** is the prefunding balance as of 1/1/2016.

Question 51

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

- (A) Less than \$35,000
- (B) \$35,000 but less than \$75,000
- (C) \$75,000 but less than \$115,000
- (D) \$115,000 but less than \$155,000
- (E) \$155,000 or more

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Data for Question 52 (2 points)

Type of plan: Multiemployer.

The plan sponsor received a five-year automatic extension in 2011. The sponsor has not requested any other extensions.

The plan sponsor submits an application for an IRC section 431(d) amortization extension to the Secretary of the Treasury in 2016. The 2016 request is to extend the previously granted extension by 5 years.

ASSERTION	REASON
The plan sponsor can receive the requested additional five-year extension for the period of time specified in the application.	A plan sponsor can receive an additional extension that, coupled with the extension already earned, will not exceed 15 years.

Question 52

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, but 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 reason are false statements

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Data for Question 53 (3 points)

Valuation date: 1/1/2016.

Funding standard carryover balance as of 1/1/2016: \$12,000.

Prefunding balance as of 1/1/2016: \$600,000.

Selected information:

	<u>1/1/2015</u>	<u>1/1/2016</u>
Minimum required contribution	\$630,000	\$645,000
Funding shortfall	500,000	450,000
Effective interest rate		6.5%

The plan sponsor makes the first contribution for the 2016 plan year of \$10,000 on 4/15/2016.

$\$X$  is the smallest amount of prefunding balance as of 1/1/2016 that can be elected on 4/15/2016 to satisfy the remaining amount of the first quarterly installment required for the 2016 plan year.

Question 53

In what range is  $\$X$ ?

- (A) Less than \$110,000
- (B) \$110,000 but less than \$122,500
- (C) \$122,500 but less than \$135,000
- (D) \$135,000 but less than \$147,500
- (E) \$147,500 or more

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Data for Question 54 (4 points)

Plan effective date: 1/1/1980.

Valuation date: 1/1/2015.

Normal retirement benefit: 6.5% of final three-year average compensation per year of service.

Assumed compensation increases: 0% per year.

No shortfall amortization bases were established prior to 2015.

Actuarial (market) value of assets: \$240,000.

Prefunding balance: \$0.

Selected valuation results as of 1/1/2015 (before reflecting 2015 increases, if any, in the IRC sections 401(a)(17) and 415 limits):

Funding target	\$240,000
Target normal cost	80,000

Selected data for sole participant Smith:

Date of birth	1/1/1952
Date of hire	1/1/2012
2012 compensation	\$290,000
2013 compensation	295,000
2014 compensation	300,000

7-year shortfall amortization factor for 2015: 5.9982.

The employer makes a single contribution of \$X on 1/1/2015 in the **smallest amount that satisfies the minimum funding standard** for the 2015 plan year.

Question 54

In what range is \$X?

- (A) Less than \$79,000
- (B) \$79,000 but less than \$80,500
- (C) \$80,500 but less than \$82,000
- (D) \$82,000 but less than \$83,500
- (E) \$83,500 or more

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Data for Question 55 (3 points)

Valuation date: 1/1/2016.

Type of plan: Hybrid (cash balance).

Death benefit: Hypothetical account balance as of the date of death.

Interest crediting rate: 4.0% credited at the end of the year on the beginning of year balance.

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

No pre-retirement decrements other than death are assumed.

Deaths are assumed to occur at the beginning of the year.

Selected data for sole participant Smith:

Date of birth	1/1/1954
Marital status	Single
Hypothetical account balance as of 1/1/2016	\$100,000

Selected mortality rates:

Age	<u>62</u>	<u>63</u>	<u>64</u>
$q_x$	0.0060	0.0069	0.0077

$\$X$  is the portion of the funding target due to the death decrement.

Question 55

In what range is  $\$X$ ?

- (A) Less than \$2,030
- (B) \$2,030 but less than \$2,070
- (C) \$2,070 but less than \$2,110
- (D) \$2,110 but less than \$2,150
- (E) \$2,150 or more

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Data for Question 56 (3 points)

Funding standard carryover balance as of 1/1/2015: \$150,000.

Prefunding balance as of 1/1/2015: \$100,000.

Selected information as of 1/1/2015:

Minimum required contribution	\$500,000
Required quarterly contribution	0
Effective interest rate	6.0%

The plan sponsor does not elect to apply the funding balances for the 2015 plan year.

Rate of return on plan assets during 2015: 12.0%.

The sole contribution for the 2015 plan year, made on 12/31/2015: \$750,000.

Question 56

What is the prefunding balance on 1/1/2016?

- (A) Less than \$300,000
- (B) \$300,000 but less than \$315,000
- (C) \$315,000 but less than \$330,000
- (D) \$330,000 but less than \$345,000
- (E) \$345,000 or more

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Data for Question 57 (1 point)

Consider the following statement related to selection of actuarial assumptions for minimum funding purposes:

All assumptions, other than those prescribed by law, should reflect the plan sponsor's best estimate of experience under the plan.

Question 57

Is the above statement true or false?

- (A) True
- (B) False

**\*\*END OF EXAMINATION\*\***

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