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, 2010.

5. This examination consists of 52 multiple-choice questions of varying value. The point value for each question is shown in parenthesis 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. 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 side 1 of the answer sheet, space is provided to write and to code candidate information. Complete Blocks A through G as follows:

(a) in Block A, print your name and the name of this test center;

(b) in Block B, print your last name, first name and middle initial and code your name by blackening the ovals (one in each column) corresponding to the letters of your name; for each empty box, blacken the small rectangle immediately above the “A” oval;

(c) write your candidate number in Block C (as it appears on your ticket of admission for this examination) and write the number of this test center in Block D (the supervisor will supply the number);

(d) code your candidate number and center number by blackening the five ovals (one in each column) corresponding to the five digits of your candidate number and the three ovals (one in each column) corresponding to the last three digits of the test center number, respectively. Please be sure that your candidate number and the test center number are coded correctly;

(e) in Block E, code the examination that you are taking by blackening the oval to the left of “Course EA-2, Segment A.”

(f) in Block F, blacken the appropriate oval to indicate whether you are using a calculator; and

(g) in Block G, sign your name and write today's date. If the answer sheet is not signed, it will not be graded.

On side 2 of your answer sheet, space is provided at the top for the number of this examination book. Enter the examination book number, from the upper right-hand corner of this examination book, in the four boxes at the top of side 2 marked "BOOKLET 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.
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>27</td>
<td>C</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>28</td>
<td>D</td>
</tr>
<tr>
<td>3</td>
<td>B</td>
<td>29</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>A</td>
<td>30</td>
<td>D</td>
</tr>
<tr>
<td>5</td>
<td>B</td>
<td>31</td>
<td>E</td>
</tr>
<tr>
<td>6</td>
<td>B</td>
<td>32</td>
<td>C</td>
</tr>
<tr>
<td>7</td>
<td>A</td>
<td>33</td>
<td>D</td>
</tr>
<tr>
<td>8</td>
<td>A and B</td>
<td>34</td>
<td>B</td>
</tr>
<tr>
<td>9</td>
<td>C and D</td>
<td>35</td>
<td>B</td>
</tr>
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<td>10</td>
<td>C</td>
<td>36</td>
<td>A</td>
</tr>
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<td>11</td>
<td>E</td>
<td>37</td>
<td>A</td>
</tr>
<tr>
<td>12</td>
<td>B and C</td>
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<td>B and C</td>
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<td>13</td>
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<td>39</td>
<td>B</td>
</tr>
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<td>14</td>
<td>B</td>
<td>40</td>
<td>D</td>
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<td>B</td>
<td>41</td>
<td>B</td>
</tr>
<tr>
<td>16</td>
<td>B</td>
<td>42</td>
<td>A</td>
</tr>
<tr>
<td>17</td>
<td>B</td>
<td>43</td>
<td>B</td>
</tr>
<tr>
<td>18</td>
<td>B</td>
<td>44</td>
<td>C</td>
</tr>
<tr>
<td>19</td>
<td>C</td>
<td>45</td>
<td>C</td>
</tr>
<tr>
<td>20</td>
<td>D</td>
<td>46</td>
<td>C</td>
</tr>
<tr>
<td>21</td>
<td>C</td>
<td>47</td>
<td>A</td>
</tr>
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<td>B</td>
<td>48</td>
<td>C</td>
</tr>
<tr>
<td>23</td>
<td>C and D</td>
<td>49</td>
<td>D</td>
</tr>
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<td>24</td>
<td>A</td>
<td>50</td>
<td>B</td>
</tr>
<tr>
<td>25</td>
<td>D</td>
<td>51</td>
<td>E</td>
</tr>
<tr>
<td>26</td>
<td>B</td>
<td>52</td>
<td>A</td>
</tr>
</tbody>
</table>
Data for Question 1 (1 point)

A plan was amended in December 2010 to increase benefits effective 7/1/2011 and 7/1/2012.

Neither increase is precluded by IRC section 436.

Consider the following statement:

For the 1/1/2011 valuation, the 7/1/2011 increase must be included and the 7/1/2012 increase must not be included in the funding target and target normal cost.

Question 1

Is this statement true or false?

(A) True

(B) False
Data for Question 2 (1 point)

Consider the following statement:

A multiemployer plan’s funding status is considered to be “seriously endangered” if either of the following measures is true:

(a) The plan is less than 80% funded for the plan year.
(b) The plan has an accumulated funding deficiency for the current year, or is projected to have a funding deficiency within 7 years.

Question 2

Is the above statement true or false?

(A) True

(B) False
Data for Question 3 (1 point)

Consider the following statement concerning a plan merger:

For any multiemployer plan to be qualified under IRC section 401 after a merger, each participant in the plan would (if the plan then terminated) receive a benefit immediately after the merger which is equal to or greater than the benefit he would have been entitled to receive immediately before the merger (if the plan had terminated).

Question 3

Is the above statement true or false?

(A) True

(B) False
Data for Question 4 (1 point)

Consider the following statement:

The initial excise tax on a missed liquidity shortfall payment is 10%.

Question 4

Is the above statement true or false?

(A) True

(B) False
Data for Question 5 (1 point)

Consider the following statement:

A 10% excise tax is due on the amount of an accumulated funding deficiency in a multiemployer pension plan, with an additional 100% excise tax if not corrected timely.

Question 5

Is the above statement true or false?

(A) True

(B) False
Data for Question 6 (1 point)

Consider the following statement:

If the prior plan year was a six-month short plan year, the quarterly contribution requirement for the current plan year is equal to 25% of the lesser of (a) 90% of the current plan year’s minimum required contribution multiplied by 6/12ths, and (b) 100% of the prior plan year’s minimum required contribution.

Question 6

Is the above statement true or false?

(A) True

(B) False
Data for Question 7 (2 points)

Funding standard carryover and prefunding balances:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2010</th>
<th>1/1/2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding standard carryover balance</td>
<td>$5,500,000</td>
<td>$5,610,000</td>
</tr>
<tr>
<td>Prefunding balance</td>
<td>$5,000,000</td>
<td>$5,100,000</td>
</tr>
</tbody>
</table>

Selected valuation results:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2010</th>
<th>1/1/2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding target</td>
<td>$100,000,000</td>
<td>$120,000,000</td>
</tr>
<tr>
<td>Actuarial (market) value of assets</td>
<td>$90,000,000</td>
<td>$100,000,000</td>
</tr>
</tbody>
</table>

Consider the following statement:

The funding standard carryover balance may be applied to the minimum required contribution for 2011.

Question 7

Is the above statement true or false?

(A) True

(B) False
Data for Question 8  (3 points)

The 1/1/2010 AFTAP is 85%.

Prefunding balance as of 1/1/2011: $0.

Funding standard carryover balance as of 1/1/2011: $15,000.

Selected valuation results as of 1/1/2011:

- Effective interest rate: 6.0%
- Actuarial (market) value of assets: $92,000
- Funding target: $100,000
- Required quarterly installment: $13,000

The 2011 AFTAP was certified before 4/1/2011.

Optional forms of payment include:

- Life annuity
- 50% Joint and survivor annuity
- 75% Joint and survivor annuity
- Lump sum distributions less than $10,000

Consider the following statement:

The funding standard carryover balance may be used to satisfy the entire 4/15/2011 required quarterly installment.

Question 8

Is the above statement true or false?

(A) True

(B) False
Data for Question 9 (2 points)

Plan effective date: 1/1/2011.

Benefit formula: 1.5% of final average compensation for each year of benefit service.

Final average compensation: Average of all years of compensation beginning with date of hire.

No benefit service is credited before the plan effective date.

Data for plan participant Smith:

Date of birth 1/1/1980
Date of hire 1/1/2009
Key employee No
Compensation for 2009 $40,000
Compensation for 2010 $45,000
Compensation for 2011 $50,000

The plan is top heavy for the 2011 plan year.

\[ X = \text{Smith’s annual accrued benefit as of December 31, 2011.} \]

Question 9

In what range is \( X \)?

(A) Less than $550

(B) $550 but less than $750

(C) $750 but less than $950

(D) $950 but less than $1,150

(E) $1,150 or more
Data for Question 10  (3 points)

Selected data for participant Smith:

- Date of birth: 12/31/1942
- Date of hire: 1/1/2005
- Date of participation: 1/1/2006
- Date of retirement: 12/31/2010
- Compensation for each year: $250,000
- Form of benefit elected: Life annuity

Plan’s actuarial equivalence interest rate: 7.5%.

The plan provides a preretirement death benefit equal to the present value of the accrued benefit.

The plan does not suspend benefits for participants working beyond normal retirement age.

Single life annuity factors at selected ages and interest rates:

<table>
<thead>
<tr>
<th>Age</th>
<th>5.0%</th>
<th>7.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>12.00</td>
<td>9.85</td>
</tr>
<tr>
<td>68</td>
<td>11.06</td>
<td>9.22</td>
</tr>
</tbody>
</table>

Question 10

In what range is Smith’s IRC section 415 limit as of 12/31/2010?

(A) Less than $116,000

(B) $116,000 but less than $121,000

(C) $121,000 but less than $126,000

(D) $126,000 but less than $131,000

(E) $131,000 or more
Data for Question 11 (4 points)

Accrued benefit: $50 per month for each year of service.

Segment rates at 1/1/2011: {5.0%, 6.0%, 7.0%}.

There is a pre-retirement mortality assumption.

Funding standard carryover balance as of 1/1/2010: $0.

Prefunding balances as of 1/1/2010 and 1/1/2011: $0 and $2,950.

Selected valuation results:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2010</th>
<th>1/1/2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuarial (market) value of assets</td>
<td>$66,000</td>
<td>$65,000</td>
</tr>
<tr>
<td>Funding target</td>
<td>$66,000</td>
<td></td>
</tr>
<tr>
<td>Target normal cost</td>
<td>$4,000</td>
<td></td>
</tr>
<tr>
<td>Effective interest rate</td>
<td></td>
<td>6.50%</td>
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<tr>
<td>Shortfall amortization factor</td>
<td></td>
<td>5.9982</td>
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</table>

Data for all plan participants:

<table>
<thead>
<tr>
<th></th>
<th>Smith</th>
<th>Jones</th>
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<tbody>
<tr>
<td>Date of birth</td>
<td>1/1/1970</td>
<td>1/1/1960</td>
</tr>
<tr>
<td>Date of hire</td>
<td>1/1/2000</td>
<td>1/1/1985</td>
</tr>
</tbody>
</table>

Selected commutation functions for 1/1/2011:

<table>
<thead>
<tr>
<th>Age</th>
<th>Segment rate 1</th>
<th>Segment rate 2</th>
<th>Segment rate 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$D_\alpha$</td>
<td>$N_{\alpha}^{(l)}$</td>
<td>$D_\alpha$</td>
</tr>
<tr>
<td>41</td>
<td>13,345</td>
<td>-</td>
<td>9,047</td>
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<tr>
<td>51</td>
<td>8,097</td>
<td>-</td>
<td>4,993</td>
</tr>
<tr>
<td>65</td>
<td>-</td>
<td>44,828</td>
<td>-</td>
</tr>
<tr>
<td>71</td>
<td>-</td>
<td>25,396</td>
<td>-</td>
</tr>
</tbody>
</table>

The employer makes a single contribution of $X$ on 4/15/2012 in the **smallest amount that satisfies the minimum funding standard** for 2011.

Question 11

In what range is $X$?

(A) Less than $1,900

(B) $1,900 but less than $2,100

(C) $2,100 but less than $2,300

(D) $2,300 but less than $2,500

(E) $2,500 or more
Data for Question 12 (4 points)

The plan is amended effective 1/1/2011.

Normal retirement benefit:

<table>
<thead>
<tr>
<th></th>
<th>Before 2011</th>
<th>After 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0% of final year compensation for each year of service</td>
<td>4.0% of final year compensation for each year of service</td>
</tr>
</tbody>
</table>

Valuation date: 1/1/2011.

Funding standard carryover balance as of 1/1/2011: $5,000.

Salary increase: 3.0%.

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

Actuarial value of assets: $50,000.

Data for sole participant Smith, who is the owner of the business:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of birth</td>
<td>1/1/1972</td>
</tr>
<tr>
<td>Date of hire</td>
<td>1/1/2002</td>
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<tr>
<td>Expected date of retirement</td>
<td>1/1/2037</td>
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<tr>
<td>2010 compensation</td>
<td>$100,000</td>
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</table>

Selected annuity factors at the indicated interest rates:

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<thead>
<tr>
<th>$A_{0:12}^{(12)}$</th>
<th>5.0%</th>
<th>6.0%</th>
<th>7.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>11.665</td>
<td>10.770</td>
<td>9.989</td>
</tr>
</tbody>
</table>

Question 12

In what range is the deduction limit for the plan year beginning 1/1/2011?

(A) Less than $60,000
(B) $60,000 but less than $100,000
(C) $100,000 but less than $140,000
(D) $140,000 but less than $180,000
(E) $180,000 or more
Data for Question 13 (2 points)

Consider the following statements regarding excise taxes on multiemployer plans in critical status:

I. A contributing employer that fails to make a contribution required by an automatic surcharge applicable for the period before timely adoption of a rehabilitation plan is not subject to an excise tax for failure to meet minimum funding standards.

II. A contributing employer that fails to timely make a contribution required under the plan’s timely adopted rehabilitation plan is subject to an excise tax in the amount of 100% of this required contribution.

III. Due to unanticipated and material fluctuations in the stock market, the plan’s enrolled actuary has certified that the plan failed to make the scheduled progress under its rehabilitation plan for three consecutive plan years. The IRS may waive the excise tax for this failure to meet the minimum funding standards.

Question 13

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

(A) I and II only

(B) I and III only

(C) II and III only

(D) I, II, and III

(E) The correct answer is not given by (A), (B), (C), or (D) above.
Data for Question 14  (3 points)

Normal retirement age: 62.

Without regard to the IRC section 415 benefit limit, the annual early retirement benefit provided to Smith by the plan provisions is $180,000.

Plan’s early retirement factor at age 61: 0.9235.

Data for plan participant Smith:

<table>
<thead>
<tr>
<th>Date of birth</th>
<th>1/1/1950</th>
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</thead>
<tbody>
<tr>
<td>Date of hire</td>
<td>1/1/2001</td>
</tr>
<tr>
<td>Date of participation</td>
<td>1/1/2002</td>
</tr>
<tr>
<td>Date of retirement</td>
<td>12/31/2010</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>$100,000</td>
</tr>
<tr>
<td>2008</td>
<td>$125,000</td>
</tr>
<tr>
<td>2009</td>
<td>$300,000</td>
</tr>
<tr>
<td>2010</td>
<td>$167,000</td>
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Selected commutation functions using applicable mortality rate and 5.0% interest:

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<th>Age</th>
<th>( N_x^{(12)} )</th>
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</thead>
<tbody>
<tr>
<td>61</td>
<td>618,223</td>
</tr>
<tr>
<td>62</td>
<td>571,733</td>
</tr>
</tbody>
</table>

Question 14

In what range is the annual benefit payable to Smith from the plan on 12/31/2010?

(A) Less than $162,000

(B) $162,000 but less than $167,000

(C) $167,000 but less than $172,000

(D) $172,000 but less than $177,000

(E) $177,000 or more
Data for Question 15 (4 points)

Type of plan: Multiemployer.

Normal retirement benefit: 1.0% of final compensation for each year of service.

Actuarial cost method: Entry age normal.

Valuation date: 1/1/2011.

Valuation interest rate: 6.0%.

Salary increase: 3.0%.

Selected annuity factor at 6.0%:

\[ \ddot{a}_{65}^{(12)} = 11.00 \]

Selected data for participant Smith:

<table>
<thead>
<tr>
<th>Date of birth</th>
<th>1/1/1952</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of hire</td>
<td>1/1/2002</td>
</tr>
<tr>
<td>Date of termination</td>
<td>12/31/2010</td>
</tr>
<tr>
<td>2010 compensation</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

Question 15

What is the absolute value of the gain or loss to the plan due to the termination of Smith?

(A) Less than $20,000

(B) $20,000 but less than $35,000

(C) $35,000 but less than $50,000

(D) $50,000 but less than $65,000

(E) $65,000 or more
Data for Question 16 (4 points)

Plan effective date: 7/1/2001.

Plan year: 7/1 - 6/30.

Normal retirement benefit: 6.0% of highest 5 consecutive year average compensation for each year of service.

Valuation date: 7/1/2011.

Segment rates: {5.0%, 6.0%, 6.5%}.

Pre-retirement mortality: None.

Data for sole plan participant Smith:

Date of birth 7/1/1961
Date of hire 7/1/2001

<table>
<thead>
<tr>
<th>Plan year end</th>
<th>Compensation</th>
<th>Plan year end</th>
<th>Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/30/2006</td>
<td>$230,000</td>
<td>6/30/2009</td>
<td>$210,000</td>
</tr>
<tr>
<td>6/30/2007</td>
<td>$215,000</td>
<td>6/30/2010</td>
<td>$250,000</td>
</tr>
<tr>
<td>6/30/2008</td>
<td>$230,000</td>
<td>6/30/2011</td>
<td>$200,000</td>
</tr>
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</table>

Selected commutation functions:

<table>
<thead>
<tr>
<th>Age</th>
<th>Segment rate 1</th>
<th>Segment rate 2</th>
<th>Segment rate 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$D_x$</td>
<td>$N_x^{(T2)}$</td>
<td>$D_x$</td>
</tr>
<tr>
<td>50</td>
<td>85,511</td>
<td>1,491,273</td>
<td>53,234</td>
</tr>
<tr>
<td>60</td>
<td>51,213</td>
<td>713,162</td>
<td>28,999</td>
</tr>
<tr>
<td>65</td>
<td>38,821</td>
<td>482,841</td>
<td>20,965</td>
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<tr>
<td>70</td>
<td>28,602</td>
<td>309,979</td>
<td>14,731</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Segment rate 1</th>
<th>Segment rate 2</th>
<th>Segment rate 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$N_x^{(T2)}$</td>
<td>$D_x$</td>
<td>$N_x^{(T2)}$</td>
</tr>
<tr>
<td>50</td>
<td>1,491,273</td>
<td>53,234</td>
<td>781,250</td>
</tr>
<tr>
<td>60</td>
<td>713,162</td>
<td>28,999</td>
<td>368,975</td>
</tr>
<tr>
<td>65</td>
<td>482,841</td>
<td>20,965</td>
<td>240,861</td>
</tr>
<tr>
<td>70</td>
<td>309,979</td>
<td>14,731</td>
<td>149,149</td>
</tr>
</tbody>
</table>

Question 16

In what range is the funding target as of 7/1/2011?

(A) Less than $575,000

(B) $575,000 but less than $595,000

(C) $595,000 but less than $615,000

(D) $615,000 but less than $635,000

(E) $635,000 or more
USE THIS PAGE FOR YOUR SCRATCH WORK

EXTRA BLANK PAPER IS PROVIDED AT THE END OF THE EXAM BOOK
Data for Question 17 (2 points)

Average compensation: Highest average 36 consecutive months of compensation.

Data for participant Smith:

Date of retirement 11/1/2010

Monthly compensation paid each month during indicated calendar year:

<table>
<thead>
<tr>
<th>Year</th>
<th>Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>$17,500</td>
</tr>
<tr>
<td>2008</td>
<td>$19,000</td>
</tr>
<tr>
<td>2009</td>
<td>$21,000</td>
</tr>
<tr>
<td>2010</td>
<td>$22,500</td>
</tr>
</tbody>
</table>

Question 17

In what range is the average monthly compensation that should be used in the calculation of Smith’s accrued benefit as of 11/1/2010?

(A) Less than $19,000
(B) $19,000 but less than $19,500
(C) $19,500 but less than $20,000
(D) $20,000 but less than $20,500
(E) $20,500 or more
Data for Question 18  (3 points)

A defined benefit plan has mandatory employee contributions of 1.0% of pay.

There is no funding standard carryover balance or prefunding balance as of 1/1/2011.

Plan-related expenses expected to be paid from plan assets during the 2011 plan year: $104,000.

The plan was exempt from establishing a shortfall amortization base in all years before the 2011 plan year.

Selected valuation results as of 1/1/2011:

- Total plan compensation for all employees: $10,000,000
- Actuarial (market) value of assets: $34,100,000
- Funding target: $33,900,000
- Target normal cost (before adjustment for expenses and employee contributions): $1,615,000

Question 18

In what range is the minimum required contribution for 2011?

(A) Less than $1,400,000
(B) $1,400,000 but less than $1,500,000
(C) $1,500,000 but less than $1,600,000
(D) $1,600,000 but less than $1,700,000
(E) $1,700,000 or more
USE THIS PAGE FOR YOUR SCRATCH WORK

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Data for Question 19  (4 points)

Effective date:  1/1/2004.

Normal retirement benefit:  3.0% of high consecutive 3-year average compensation per year of service.

Plan actuarial equivalence assumptions:
  Interest rate  4.5%
  Mortality  Applicable mortality table

Data for plan participant Smith:

<table>
<thead>
<tr>
<th>Date of birth</th>
<th>1/1/1946</th>
<th>High consecutive 3-year average compensation</th>
<th>$235,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of hire</td>
<td>1/1/1991</td>
<td>Form of payment elected</td>
<td>Lump sum</td>
</tr>
<tr>
<td>Date of retirement</td>
<td>1/1/2011</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IRC section 415(b) limit for 2011 for purposes of this question: $200,000.

Commutation functions at the applicable interest rates and other selected rates and the applicable mortality table:

<table>
<thead>
<tr>
<th>Age</th>
<th>Segment rate 1</th>
<th>Segment rate 2</th>
<th>Segment rate 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$D_x$</td>
<td>$N_x^{(T2)}$</td>
<td>$D_x$</td>
</tr>
<tr>
<td>65</td>
<td>38,856</td>
<td>466,449</td>
<td>20,984</td>
</tr>
<tr>
<td>70</td>
<td>28,646</td>
<td>298,073</td>
<td>14,754</td>
</tr>
<tr>
<td>85</td>
<td>7,617</td>
<td>40,156</td>
<td>3,403</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Segment rate 1</th>
<th>Segment rate 2</th>
<th>Segment rate 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$D_x$</td>
<td>$N_x^{(T2)}$</td>
<td>$D_x$</td>
</tr>
<tr>
<td>65</td>
<td>52,992</td>
<td>664,276</td>
<td>28,534</td>
</tr>
<tr>
<td>70</td>
<td>40,010</td>
<td>432,084</td>
<td>20,542</td>
</tr>
<tr>
<td>85</td>
<td>11,429</td>
<td>61,450</td>
<td>5,087</td>
</tr>
</tbody>
</table>

There have always been fewer than 100 participants in the plan.

Question 19

In what range is the lump sum payable to Smith as of 1/1/2011?

(A) Less than $1,450,000
(B) $1,450,000 but less than $1,550,000
(C) $1,550,000 but less than $1,650,000
(D) $1,650,000 but less than $1,750,000
(E) $1,750,000 or more

Exam EA-2 (Segment A) Fall 2010                  - 37 -                  GO ON TO NEXT PAGE
Pension
Data for Question 20  (4 points)

Plan effective date:  1/1/2000.

The plan had no carryover balance as of 1/1/2008.

Prefunding balances:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2010</th>
<th>1/1/2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prefunding balance</td>
<td>$500,000</td>
<td>$600,000</td>
</tr>
<tr>
<td>Balance applied?</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Selected valuation results:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2010</th>
<th>1/1/2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuarial (market) value of assets</td>
<td>$15,000,000</td>
<td>$17,000,000</td>
</tr>
<tr>
<td>Funding target</td>
<td>$15,500,000</td>
<td>$16,750,000</td>
</tr>
<tr>
<td>Target normal cost</td>
<td>$750,000</td>
<td>$900,000</td>
</tr>
</tbody>
</table>

Shortfall amortization factors at both 1/1/2010 and 1/1/2011:

- 7-year shortfall amortization factor: 5.9982
- 6-year shortfall amortization factor: 5.2932

A single contribution of $X$ is to be made on 1/1/2011 in the **smallest amount that satisfies the minimum funding standard** for the 2011 plan year.

**Question 20**

In what range is $X$?

(A) Less than $330,000

(B) $330,000 but less than $345,000

(C) $345,000 but less than $360,000

(D) $360,000 but less than $375,000

(E) $375,000 or more
Data for Question 21  (2 points)

The plan sponsor is considering the following plan changes to be adopted before 1/1/2011.

Scenario A amends the retirement benefit formula to increase the dollar multiplier from $30 to $40 for service earned after 8/1/2011.

Scenario B amends the retirement benefit formula to cease the dollar multiplier of $30 for all benefit accruals after 8/1/2011 (i.e., freeze all benefit accruals on 7/31/2011).

Scenario C amends the retirement benefit formula to increase the dollar multiplier from $30 to $40 for all years of service if the participant earned an hour of service on or after 8/1/2011.

The plan amendments are permitted under IRC section 436(c).

Define the following items:

- TNC-A = the 2011 target normal cost for Scenario A.
- TNC-B = the 2011 target normal cost for Scenario B.
- TNC-C = the 2011 target normal cost for Scenario C.

Question 21

Which of the following statement is true?

(A)  TNC-A > TNC-B > TNC-C
(B)  TNC-A > TNC-C > TNC-B
(C)  TNC-C > TNC-A > TNC-B
(D)  TNC-C > TNC-B > TNC-A
(E)  The correct answer is not given by (A), (B), (C), or (D) above.
Data for Question 22 (3 points)

Effective date: 1/1/2009.

For 2011, the plan is not at-risk.

Selected valuation results as of 1/1/2011:

- Actuarial (market) value of assets: $300,000
- Funding target (not-at-risk): $320,000
  Target normal cost (not-at-risk): $60,000
- Funding target (at-risk for IRC 404 purposes): $500,000
  Target normal cost (at-risk for IRC 404 purposes): $90,000
- Funding target (not-at-risk) with future salary increases: $405,000
  Funding target (at-risk for IRC 404 purposes) with future salary increases: $740,000
- Effective interest rate: 6.0%

Question 22

In what range is the deduction limit for 2011?

(A) Less than $310,000
(B) $310,000 but less than $360,000
(C) $360,000 but less than $410,000
(D) $410,000 but less than $460,000
(E) $460,000 or more
Data for Question 23 (5 points)

Plan effective date: 1/1/2000.

The plan has a lump sum option.


The sponsor did not apply or add to the prefunding balance for the 2010 plan year.

Actual rate of return for plan year ending 12/31/2010: 6.67%

Selected valuation results:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2010</th>
<th>1/1/2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding target</td>
<td>$3,850,000</td>
<td></td>
</tr>
<tr>
<td>Target normal cost</td>
<td>$300,000</td>
<td></td>
</tr>
<tr>
<td>Actuarial value of assets</td>
<td>$2,500,000</td>
<td></td>
</tr>
<tr>
<td>Shortfall installment (created at 1/1/2010)</td>
<td>$25,000</td>
<td></td>
</tr>
<tr>
<td>7-year shortfall amortization factor</td>
<td>5.9982</td>
<td></td>
</tr>
<tr>
<td>6-year shortfall amortization factor</td>
<td>5.2932</td>
<td></td>
</tr>
<tr>
<td>Funding target attainment percentage</td>
<td>70%</td>
<td></td>
</tr>
</tbody>
</table>

The employer makes a single contribution of X on 1/1/2011 in the **smallest amount that satisfies the minimum funding standard** for the 2011 plan year.

**Question 23**

In what range is X?

(A) Less than $521,000

(B) $521,000 but less than $541,000

(C) $541,000 but less than $561,000

(D) $561,000 but less than $581,000

(E) $581,000 or more
Data for Question 24  (4 points)

Type of plan: Multiemployer.

Valuation interest rate: 7.0%.

Benefits are payable annually at the beginning of the year.

Data for selected plan participants as of 1/1/2011:

<table>
<thead>
<tr>
<th></th>
<th>Smith</th>
<th>Jones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current age</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Retirement age</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Annual benefit</td>
<td>$1,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>Benefit form</td>
<td>Life with 10-year certain</td>
<td>Life with 10-year certain</td>
</tr>
</tbody>
</table>

Selected commutation functions and mortality rates:

<table>
<thead>
<tr>
<th>Age</th>
<th>$D_x$</th>
<th>$N_x$</th>
<th>$q_x$</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>10,000</td>
<td>102,245</td>
<td>0.010</td>
</tr>
<tr>
<td>75</td>
<td>4,322</td>
<td>33,380</td>
<td>0.027</td>
</tr>
</tbody>
</table>

Smith dies during 2011.

Question 24

In what range is the absolute value of the mortality gain or loss attributable to Smith and Jones as of 1/1/2012?

(A) Less than $3,550

(B) $3,550 but less than $7,100

(C) $7,100 but less than $10,650

(D) $10,650 but less than $14,200

(E) $14,200 or more
Data for Question 25 (2 points)

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

**ASSERTION**
When choosing expected rates of retirement for a pension plan, the plan actuary should not consider whether or not the plan sponsor offers post-retirement medical benefits (under a separate plan) to participants who retire under the pension plan.

**REASON**
The cost of benefits provided from a separate plan is not included in the liabilities calculated for the pension plan.

---

**Question 25**
Which of the following statement(s) is/are true?

(A) Both the assertion and the reason are true statements and the reason is a correct explanation of the assertion.

(B) Both the assertion and the reason are true statements and the reason is not a correct explanation of the assertion.

(C) The assertion is a true statement, but the reason is a false statement.

(D) The assertion is a false statement, but the reason is a true statement.

(E) Both the assertion and the reason are false statements.
Data for Question 26 (3 points)

Plan effective date: 1/1/1995.

Normal retirement benefit: $100 per month for each year of service.

The plan defines actuarial equivalence as the applicable interest and mortality under IRC section 417(e) with no pre-retirement mortality.

Applicable 417(e) segment rates: \{5.0\%, 6.0\%, 7.0\%\}.

Selected information for participant Smith:
- Date of birth 1/1/1966
- Date of hire 1/1/1996
- Date of termination 1/1/2011

Selected commutation functions:

<table>
<thead>
<tr>
<th>Age</th>
<th>Segment rate 1</th>
<th>Segment rate 2</th>
<th>Segment rate 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$D_x$</td>
<td>$N_x^{(12)}$</td>
<td>$D_x$</td>
</tr>
<tr>
<td>45</td>
<td>109,730</td>
<td>1,848,847</td>
<td>71,627</td>
</tr>
<tr>
<td>65</td>
<td>38,821</td>
<td>465,050</td>
<td>20,965</td>
</tr>
<tr>
<td>70</td>
<td>28,602</td>
<td>296,871</td>
<td>14,731</td>
</tr>
<tr>
<td>85</td>
<td>7,564</td>
<td>39,772</td>
<td>3,379</td>
</tr>
</tbody>
</table>

Selected commutation functions:

$D_x$ $N_x^{(12)}$
$46,943$ $625,535$
$11,387$ $116,222$
$7,635$ $68,985$
$1,521$ $7,420$

Smith receives a lump sum on 1/1/2011 equal to the present value of his accrued benefit.

Question 26

In what range is the lump sum payment Smith receives on 1/1/2011?

(A) Less than $46,000
(B) $46,000 but less than $50,500
(C) $50,500 but less than $55,000
(D) $55,000 but less than $59,500
(E) $59,500 or more

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Data for Question 27 (4 points)

Type of plan: Multiemployer.

Plan effective date: 1/1/1983.

Actuarial cost method: Frozen initial liability.

Valuation interest rate: 7.0%.

Initial unfunded accrued liability: $5,000,000.

Credit balance in the funding standard account as of 12/31/2010: $400,000.

Selected valuation results as of 1/1/2011:

<table>
<thead>
<tr>
<th>Present value future benefits</th>
<th>$35,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuarial (market) value of assets</td>
<td>$30,000,000</td>
</tr>
<tr>
<td>Present value of future compensation</td>
<td>$80,000,000</td>
</tr>
<tr>
<td>Total compensation</td>
<td>$8,000,000</td>
</tr>
</tbody>
</table>

The employer makes a single contribution of X on 12/31/2011 in the smallest amount that satisfies the minimum funding standard for the 2011 plan year.

Question 27

In what range is X?

(A) Less than $450,000

(B) $450,000 but less than $470,000

(C) $470,000 but less than $490,000

(D) $490,000 but less than $510,000

(E) $510,000 or more
Data for Question 28  (4 points)

Plan effective date:  1/1/2005.

Selected interest rates for all years:

Segment rates  \{5.0\%, 6.0\%, 7.0\%\}
Assumed annual rate of return on assets  \ 7.5\%

Funding standard carryover balance as of 1/1/2011:  $12,000.

Asset valuation method:

Current method  Market value of assets
Method under consideration  Market value of assets averaged over the valuation
date and the prior two valuation dates, in accordance
with IRS Notice 2009-22

Selected valuation results:

\begin{array}{c|c|c|c}
 & 1/1/2009 & 1/1/2010 & 1/1/2011 \\
\hline
Funding target & $2,000,000 & $2,100,000 & \\
Target normal cost & & $100,000 & \\
Market value of assets & $2,100,000 & $2,200,000 & $1,900,000 \\
\end{array}

Benefits paid for 2009 and 2010:  $50,000, paid at the end of each year.

7-year shortfall amortization factor:  5.9982.

Shortfall amortization installments and minimum required contributions for 2009 and 2010:  $0.

No contributions were made for 2008, 2009, and 2010.

Question 28

In what range is the absolute value of the difference in the 2011 minimum required contribution before and after the asset valuation method change being considered?

(A)  Less than $20,000
(B)  $20,000 but less than $25,000
(C)  $25,000 but less than $30,000
(D)  $30,000 but less than $35,000
(E)  $35,000 or more
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Data for Question 29  (2 points)

Consider the following statements regarding the actuary’s selection of actuarial assumptions for determining minimum required contributions:

I. For single employer plans: with the exception of prescribed assumptions, each actuarial assumption must be reasonable and must, in combination, offer the actuary’s best estimate of anticipated experience under the plan.

II. For multiemployer plans: assumptions should be reasonable only in aggregate.

III. Plans with more than 50 participants must use preretirement mortality assumptions.

Question 29

Which, if any, of the above statement(s) 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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EXTRA BLANK PAPER IS PROVIDED AT THE END OF THE EXAM BOOK
Data for Question 30  (3 points)

Participant data as of 12/31/2010:

<table>
<thead>
<tr>
<th>Employee</th>
<th>Present Value of Accrued Benefits</th>
<th>2010 Compensation</th>
<th>Ownership Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee 1</td>
<td>$450,000</td>
<td>$220,000</td>
<td>98%</td>
</tr>
<tr>
<td>Employee 2</td>
<td>$400,000</td>
<td>$140,000</td>
<td>0%</td>
</tr>
<tr>
<td>Employee 3</td>
<td>$200,000</td>
<td>$180,000</td>
<td>2%</td>
</tr>
<tr>
<td>Employee 4</td>
<td>$100,000</td>
<td>$200,000</td>
<td>0%</td>
</tr>
<tr>
<td>25 others</td>
<td>$400,000</td>
<td>$800,000</td>
<td>0%</td>
</tr>
</tbody>
</table>

The present value of accrued benefits above includes the present value of rollovers.

Employee 1, Employee 2, and Employee 3 are the only officers of the company.

Employee 1, Employee 2, and Employee 3 were all key employees before 2010.

Employee 2 received a rollover from a plan of another employer during 2009. The present value of the rollover account is $60,000 as of 12/31/2010.

Employee 4 received a rollover from a plan of another employer during 2008. The present value of the rollover account is $75,000 as of 12/31/2010.

Question 30

In what range is the plan’s top-heavy ratio for 2011?

(A) Less than 0.43

(B) 0.43 but less than 0.50

(C) 0.50 but less than 0.57

(D) 0.57 but less than 0.64

(E) 0.64 or more
Data for Question 31  (4 points)

The plan was exempt from establishing a shortfall amortization base in all years before the 2011 plan year.

Plan-related expenses expected to be paid from plan assets during the plan year:  $27,500.

Funding standard carryover balance as of 1/1/2011:  $200,000.

Prefunding balance as of 1/1/2011:  $500,000.

Selected valuation results as of 1/1/2011:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuarial (market) value of assets</td>
<td>$5,500,000</td>
</tr>
<tr>
<td>Funding target</td>
<td>$5,200,000</td>
</tr>
<tr>
<td>Target normal cost (excluding plan-related expenses)</td>
<td>$350,000</td>
</tr>
<tr>
<td>7-year shortfall amortization factor</td>
<td>5.9982</td>
</tr>
</tbody>
</table>

An election is made to apply the entire funding standard carryover balance and $150,000 of the prefunding balance to offset the 2011 minimum required contribution.

The employer makes a single contribution of X on 1/1/2011 in the smallest amount required to avoid an unpaid minimum required contribution for the 2011 plan year.

Question 31

In what range is X?

(A)  Less than $20,000
(B)  $20,000 but less than $40,000
(C)  $40,000 but less than $60,000
(D)  $60,000 but less than $80,000
(E)  $80,000 or more
Data for Question 32 (5 points)

Selected plan provisions:

Earliest early retirement age 55
Early retirement reduction 3.0% per year by which benefits begin before age 65

Plan has been in at-risk status for the 2008, 2009, and 2010 plan years.

Segment rates for 2011: \{5.0\%, 6.0\%, 7.0\%\}.

There is a pre-retirement mortality assumption.

Selected data for participant Smith as of 1/1/2011:

<table>
<thead>
<tr>
<th>Date of birth</th>
<th>1/1/1956</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual accrued benefit</td>
<td>$10,000</td>
</tr>
<tr>
<td>Marital status</td>
<td>Single</td>
</tr>
</tbody>
</table>

Selected commutation functions:

<table>
<thead>
<tr>
<th>Age</th>
<th>(D_x)</th>
<th>(N_x^{(T2)})</th>
<th>(D_x)</th>
<th>(N_x^{(T2)})</th>
<th>(D_x)</th>
<th>(N_x^{(T2)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>66,478</td>
<td>984,873</td>
<td>39,470</td>
<td>526,954</td>
<td>23,550</td>
<td>285,466</td>
</tr>
<tr>
<td>56</td>
<td>63,164</td>
<td>919,914</td>
<td>37,148</td>
<td>488,548</td>
<td>21,957</td>
<td>262,646</td>
</tr>
<tr>
<td>60</td>
<td>51,243</td>
<td>691,251</td>
<td>29,016</td>
<td>356,431</td>
<td>16,518</td>
<td>185,907</td>
</tr>
<tr>
<td>61</td>
<td>48,568</td>
<td>641,235</td>
<td>27,242</td>
<td>328,228</td>
<td>15,363</td>
<td>169,918</td>
</tr>
<tr>
<td>65</td>
<td>38,856</td>
<td>466,449</td>
<td>20,984</td>
<td>231,910</td>
<td>11,398</td>
<td>116,537</td>
</tr>
<tr>
<td>75</td>
<td>20,282</td>
<td>176,044</td>
<td>9,963</td>
<td>81,453</td>
<td>4,926</td>
<td>38,046</td>
</tr>
<tr>
<td>76</td>
<td>18,789</td>
<td>156,446</td>
<td>9,142</td>
<td>71,867</td>
<td>4,478</td>
<td>33,325</td>
</tr>
</tbody>
</table>

Question 32

In what range is the absolute value of the difference between the not-at-risk and the at-risk funding target, ignoring any phase-in, for Smith as of 1/1/2011?

(A) Less than $33,000

(B) $33,000 but less than $35,000

(C) $35,000 but less than $37,000

(D) $37,000 but less than $39,000

(E) $39,000 or more
Data for Question 33 (2 points)

Valuation date: 1/1/2011.

The benefit formula for Plan A is a pay-related formula based on the final 3-year average compensation.

The benefit formula for Plan B is a not a pay-related formula.

The two plans have the same funding target, target normal cost, and actuarial (market) value of plan assets.

Neither plan is in at-risk status.

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

**ASSERTION**
The 2011 deduction limit for Plan A is larger than the 2011 deduction limit for Plan B.

**REASON**
For Plan B, the impact of future salary increases is not reflected in the cushion amount.

Question 33
Which of the following statements is true?

(A) Both the assertion and the reason are true statements and the reason is a correct explanation of the assertion.

(B) Both the assertion and the reason are true statements and the reason is NOT a correct explanation of the assertion.

(C) The assertion is a true statement, but the reason is a false statement.

(D) The assertion is a false statement, but the reason is a true statement.

(E) Both the assertion and the reason are false statements.
Data for Question 34 (3 points)

Plan effective date: 1/1/2011.

Selected valuation results:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2012</th>
<th>1/1/2013</th>
<th>1/1/2014</th>
<th>1/1/2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding target using not-at-risk assumptions</td>
<td>$1,000,000</td>
<td>$1,200,000</td>
<td>$1,150,000</td>
<td>$1,100,000</td>
</tr>
<tr>
<td>Target normal cost using not-at-risk assumptions</td>
<td></td>
<td></td>
<td></td>
<td>$33,000</td>
</tr>
<tr>
<td>Actuarial (market) value of assets</td>
<td>$940,000</td>
<td>$900,000</td>
<td>$880,000</td>
<td>$860,000</td>
</tr>
<tr>
<td>Funding target using at-risk assumptions</td>
<td>$1,300,000</td>
<td>$1,500,000</td>
<td>$1,450,000</td>
<td>$1,400,000</td>
</tr>
<tr>
<td>Target normal cost using at-risk assumptions</td>
<td></td>
<td></td>
<td></td>
<td>$40,000</td>
</tr>
</tbody>
</table>

Prefunding balance as of each 1/1: $0.

The plan was not in at-risk status for either the 2011 or the 2012 plan year.

There have always been at least 600 participants in the plan.

Question 34

In what range is the target normal cost for 2015?

(A) Less than $34,000
(B) $34,000 but less than $36,000
(C) $36,000 but less than $38,000
(D) $38,000 but less than $40,000
(E) $40,000 or more
USE THIS PAGE FOR YOUR SCRATCH WORK
Data for Question 35 (4 points)

Type of plan: Multiemployer.

Normal retirement benefit: $40 per month per year of service.

Early retirement eligibility: Age 55.

Early retirement benefit: Unreduced accrued benefit.

Valuation date: 1/1/2011.

Actuarial cost method: Unit credit.

Valuation interest rate: 7.5%.

Pre-retirement mortality: None.

Data for participant Smith:

Date of birth 1/1/1956
Date of hire 1/1/2001

The actuary changes the retirement and mortality assumptions.

Retirement rates and selected annuity factors:

<table>
<thead>
<tr>
<th>X</th>
<th>Old assumptions</th>
<th>New assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( q_x^{(ret)} )</td>
<td>( \overline{a}_x^{(12)} )</td>
</tr>
<tr>
<td>55</td>
<td>10%</td>
<td>11.10</td>
</tr>
<tr>
<td>62</td>
<td>25%</td>
<td>9.86</td>
</tr>
<tr>
<td>65</td>
<td>100%</td>
<td>9.25</td>
</tr>
</tbody>
</table>

Question 35

In what range is the absolute value of the change in liability for Smith due to the change in assumptions?

(A) Less than $700

(B) $700 but less than $1,100

(C) $1,100 but less than $1,500

(D) $1,500 but less than $1,900

(E) $1,900 or more
Data for Question 36 (4 points)

Effective interest rate for both 2010 and 2011 plan years: 7.0%.

Funding standard carryover balance as of 1/1/2010: $0.

Prefunding balance as of 1/1/2010: $0.

Funding target attainment percentage as of 1/1/2010: 90%.

Minimum required contribution for 2010: $100,000.

Contribution for 2010 made on 10/15/2010: $125,000.

There were no required quarterly installments due for 2010.

Actual rate of return on assets for 2010: 5.0%.

Minimum required contribution for 2011: $125,000.

The employer elects, on the due date for each quarterly contribution, to use any available funding standard carryover balance and prefunding balance in the amount necessary to satisfy required quarterly installments.

The employer makes additional contributions of $X on 4/15/2011 and $Y on 7/15/2011 in the smallest additional amount necessary to satisfy the required quarterly installments.

Question 36

In what range is $X + $Y?

(A) Less than $30,000

(B) $30,000 but less than $35,000

(C) $35,000 but less than $40,000

(D) $40,000 but less than $45,000

(E) $45,000 or more
Data for Question 37 (2 points)

Plan effective date: 1/1/2000.

Selected valuation results as of 1/1/2010:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding target</td>
<td>$10,000</td>
</tr>
<tr>
<td>Actuarial (market) value of plan assets</td>
<td>$9,700</td>
</tr>
<tr>
<td>Funding standard carryover balance</td>
<td>$0</td>
</tr>
<tr>
<td>Prefunding balance</td>
<td>$200</td>
</tr>
</tbody>
</table>

The plan sponsor did not elect to use the prefunding balance to offset the minimum required contribution.

Consider the following statement:

The plan is exempt from establishing a shortfall amortization base for 2010.

Question 37

Is the above statement true or false?

(A) True

(B) False
Data for Question 38 (3 points)

Effective interest rate: 5.0%.

Actuarial (market) value of assets as of 1/1/2011: $240,000.

Selected valuation results as of 1/1/2011:

<table>
<thead>
<tr>
<th>Funding target</th>
<th>Not at-risk assumptions</th>
<th>$220,000</th>
<th>At-risk assumptions for section 404(o) purposes</th>
<th>$235,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding target, including effects of future compensation increases</td>
<td>$280,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target normal cost</td>
<td>$15,000</td>
<td>$17,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Amounts previously contributed to the trust but not yet deducted as of 1/1/2011: $12,000.

Question 38

In what range is the deduction limit for 2011?

(A) Less than $164,000

(B) $164,000 but less than $175,000

(C) $175,000 but less than $186,000

(D) $186,000 but less than $197,000

(E) $197,000 or more
**Data for Question 39 (5 points)**

Normal retirement benefit: 1.5% of final compensation for each year of service.

Early retirement eligibility: Age 62 with 20 or more years of service.

Early retirement reduction: 6.0% per year before age 65.

Valuation assumptions:

- **Segment rates**: {4.0%, 6.0%, 8.0%}
- **Retirement rates**: 25% at age 62, 100% at age 65
- **Pre-retirement mortality**: None

**Data for participant Smith:**

- Date of birth: 1/1/1951
- Date of hire: 1/1/1981
- 2010 compensation: $100,000

**Selected commutation functions:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Segment rate 1</th>
<th>Segment rate 2</th>
<th>Segment rate 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$D_x$</td>
<td>$N_x^{(12)}$</td>
<td>$D_x$</td>
</tr>
<tr>
<td>60</td>
<td>4,990</td>
<td>65,080</td>
<td>2,830</td>
</tr>
<tr>
<td>62</td>
<td>4,460</td>
<td>55,610</td>
<td>2,480</td>
</tr>
<tr>
<td>65</td>
<td>3,750</td>
<td>43,270</td>
<td>2,030</td>
</tr>
<tr>
<td>80</td>
<td>1,190</td>
<td>7,920</td>
<td>560</td>
</tr>
</tbody>
</table>

**Question 39**

In what range is the 1/1/2011 funding target for Smith?

(A) Less than $340,000

(B) $340,000 but less than $365,000

(C) $365,000 but less than $390,000

(D) $390,000 but less than $415,000

(E) $415,000 or more
Data for Question 40  (4 points)

Effective date:  1/1/2009.

Segment rates for 2011:  \{5.0\%, 6.0\%, 7.0\%\}.

Shortfall amortization base as of 1/1/2009:  $0.

Waived funding deficiency for 2009 as of 1/1/2009: $40,000.

2009 waiver amortization factor:  4.6228.

Shortfall amortization base as of 1/1/2010:  $9,000.

7-year shortfall amortization factor for 2010:  5.9253.

The minimum required contribution for 2010 was made on 1/1/2010.

Selected valuation results as of 1/1/2011:

- Actuarial (market) value of assets $280,000
- Funding target $300,000
- Target normal cost $30,000

7-year shortfall amortization factor for 2011:  5.9982.
6-year shortfall amortization factor for 2011:  5.2932.

Question 40

In what range is the **minimum required contribution** for 2011?

(A)  Less than $36,000
(B)  $36,000 but less than $36,900
(C)  $36,900 but less than $37,800
(D)  $37,800 but less than $38,700
(E)  $38,700 or more
Valuation date: 1/1/2011.

The plan does not offer any accelerated benefit distributions.

Segment rates for all years: \{5.0\%, 6.0\%, 7.0\%\}.

Funding standard carryover and prefunding balances:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2010</th>
<th>1/1/2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding standard carryover balance</td>
<td>$480,000</td>
<td></td>
</tr>
<tr>
<td>Prefunding balance</td>
<td>$62,500</td>
<td>$50,000</td>
</tr>
</tbody>
</table>

Selected valuation results:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2010</th>
<th>1/1/2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding target</td>
<td></td>
<td>$6,920,000</td>
</tr>
<tr>
<td>Actuarial (market) value of assets</td>
<td></td>
<td>$5,600,000</td>
</tr>
<tr>
<td>Effective interest rate</td>
<td></td>
<td>6.06%</td>
</tr>
</tbody>
</table>

Data for all shortfall amortization bases established before 1/1/2011:

<table>
<thead>
<tr>
<th>Date established</th>
<th>Original shortfall amortization base</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/2009</td>
<td>$1,330,000</td>
</tr>
<tr>
<td>1/1/2010</td>
<td>$200,000</td>
</tr>
</tbody>
</table>

Actual rate of return on assets for 2010: -20.0\% (negative 20.0\%).

Shortfall amortization factors for all years:

<table>
<thead>
<tr>
<th>Year</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-year</td>
<td>4.5459</td>
</tr>
<tr>
<td>6-year</td>
<td>5.2932</td>
</tr>
<tr>
<td>7-year</td>
<td>5.9982</td>
</tr>
</tbody>
</table>

The plan sponsor did not elect to apply the funding standard carryover or prefunding balance for the 2010 plan year.

**Question 41**

In what range is the shortfall amortization charge as of 1/1/2011?

(A) Less than $350,000

(B) $350,000 but less than $354,000

(C) $354,000 but less than $358,000

(D) $358,000 but less than $362,000

(E) $362,000 or more
Data for Question 42 (2 points)

The plan does not offer any accelerated benefit options

<table>
<thead>
<tr>
<th></th>
<th>1/1/2010</th>
<th>1/1/2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding standard carryover balance</td>
<td>$100,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Prefunding balance</td>
<td>$150,000</td>
<td>$300,000</td>
</tr>
</tbody>
</table>

Selected valuation results:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2010</th>
<th>1/1/2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuarial (market) value of assets</td>
<td>$1,000,000</td>
<td>$1,250,000</td>
</tr>
<tr>
<td>Funding target</td>
<td>$1,000,000</td>
<td>$1,250,000</td>
</tr>
</tbody>
</table>

Consider the following statements for the 2011 plan year:

I. The funding standard carryover and prefunding balances can be used to reduce the minimum required contribution.

II. The plan is subject to quarterly contribution requirements.

III. The plan’s funding shortfall is $0.

Question 42

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

(A) I and II only

(B) I and III only

(C) II and III only

(D) I, II, and III

(E) The correct answer is not given by (A), (B), (C), or (D) above
Data for Question 43  (3 points)

Data for participant Smith:

Date of birth 1/1/1966
Date of termination 1/1/2011
Vested monthly accrued benefit $2,500

Smith will receive a lump sum distribution on 1/1/2011 equal to the present value of his vested accrued benefit.

Plan actuarial equivalence for lump sum distributions:
- Interest basis: Applicable interest rate using 3-month lookback
- Pre-retirement mortality: None

30-year Treasury rate in effect October 2010 and December 2010: 4.0%.

Applicable segment rates in effect:
- October 2010 (before phase-in) {5.0%, 6.0%, 7.0%}
- December 2010 (before phase-in) {5.5%, 6.5%, 7.5%}

Selected annuity values:

<table>
<thead>
<tr>
<th>Interest rate</th>
<th>$d_{65}^{(12)}$</th>
<th>Interest rate</th>
<th>$d_{65}^{(12)}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0%</td>
<td>12.79</td>
<td>6.1%</td>
<td>10.78</td>
</tr>
<tr>
<td>5.0%</td>
<td>11.79</td>
<td>6.4%</td>
<td>10.53</td>
</tr>
<tr>
<td>5.5%</td>
<td>11.32</td>
<td>6.5%</td>
<td>10.44</td>
</tr>
<tr>
<td>5.8%</td>
<td>11.05</td>
<td>6.8%</td>
<td>10.19</td>
</tr>
<tr>
<td>6.0%</td>
<td>10.87</td>
<td>7.0%</td>
<td>10.02</td>
</tr>
</tbody>
</table>

Question 43

In what range is the lump sum distribution payable to Smith on 1/1/2011?

(A) Less than $85,000
(B) $85,000 but less than $95,000
(C) $95,000 but less than $105,000
(D) $105,000 but less than $115,000
(E) $115,000 or more
Data for Question 44  (4 points)

Type of plan:  Multiemployer.

Plan provisions:

- Normal retirement benefit: $185 per month for each year of service
- Early retirement eligibility: Age 62
- Early retirement benefit: Accrued benefit reduced by 3.0% for each year that benefit commencement date precedes age 65

Actuarial cost method:  Entry age normal.

Valuation interest rate:  7.0%.

Data for plan participant Smith:

- Date of birth: 1/1/1954
- Date of hire: 1/1/2002

Probability of retirement:

- Age 62: 50%
- Age 65: 100%

Selected commutation functions:

<table>
<thead>
<tr>
<th>Age</th>
<th>$D_x$</th>
<th>$N_x^{(12)}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>14,268</td>
<td>154,707</td>
</tr>
<tr>
<td>65</td>
<td>11,387</td>
<td>116,222</td>
</tr>
</tbody>
</table>

Question 44

In what range is Smith’s accrued liability as of 1/1/2011?

(A)  Less than $150,000

(B)  $150,000 but less than $155,000

(C)  $155,000 but less than $160,000

(D)  $160,000 but less than $165,000

(E)  $165,000 or more
Data for Question 45 (4 points)

Valuation date: 1/1/2011.

Segment rates for 2011: \{5.0\%, 6.0\%, 7.0\%\}.

Data for participant Smith:

- Date of birth: 1/1/1944
- Date of retirement: 1/1/2009
- Monthly benefit amount: $1,000
- Benefit form: 10-year certain and life

Selected commutation functions:

<table>
<thead>
<tr>
<th>Age</th>
<th>Segment rate 1 (D_x \ N_x^{(12)})</th>
<th>Segment rate 2 (D_x \ N_x^{(12)})</th>
<th>Segment rate 3 (D_x \ N_x^{(12)})</th>
<th>Effective interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>67</td>
<td>34,491</td>
<td>18,277</td>
<td>9,743</td>
<td>13,334</td>
</tr>
<tr>
<td>75</td>
<td>20,229</td>
<td>9,936</td>
<td>4,913</td>
<td>6,981</td>
</tr>
<tr>
<td>77</td>
<td>17,293</td>
<td>8,335</td>
<td>4,045</td>
<td>5,801</td>
</tr>
<tr>
<td>87</td>
<td>5,678</td>
<td>2,489</td>
<td>1,100</td>
<td>1,653</td>
</tr>
</tbody>
</table>

Selected annuity certain factors (payable monthly) as of 1/1/2011:

<table>
<thead>
<tr>
<th>Segment rates</th>
<th>Effective interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-year</td>
<td>6.53</td>
</tr>
<tr>
<td>10-year</td>
<td>7.69</td>
</tr>
</tbody>
</table>

Question 45

In what range is the funding target for Smith as of 1/1/2011?

(A) Less than $127,500

(B) $127,500 but less than $129,000

(C) $129,000 but less than $130,500

(D) $130,500 but less than $132,000

(E) $132,000 or more
Data for Question 46  (4 points)

Asset valuation method:  Average value of assets over one year.

Assumed annual rate of return on assets:  8.0%.

Segment rates for 2010:  \{5.0\%, 6.0\%, 7.0\%\}.

Effective interest rate for 2010:  6.0%.

Benefit payments and expenses are assumed to be paid mid-year.

Selected asset information:

<table>
<thead>
<tr>
<th>Plan year</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market value at 1/1 (excluding receivables)</td>
<td>$580,000</td>
<td>$795,000</td>
</tr>
<tr>
<td>Benefit payments</td>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td>Expenses</td>
<td>$35,000</td>
<td></td>
</tr>
</tbody>
</table>

Contributions for the 2010 plan year:

<table>
<thead>
<tr>
<th>Date</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/1/2010</td>
<td>$50,000</td>
</tr>
<tr>
<td>9/1/2011</td>
<td>$150,000</td>
</tr>
</tbody>
</table>

There were no contributions for the 2009 plan year made in 2010.

Question 46

In what range is the actuarial value of assets as of 1/1/2011?

(A)  Less than $830,000

(B)  $830,000 but less than $840,000

(C)  $840,000 but less than $850,000

(D)  $850,000 but less than $860,000

(E)  $860,000 or more
Data for Question 47  (2 points)

Selected valuation results as of 1/1/2011:

- Funding target $1,600,000
- Target normal cost $90,000
- Actuarial (market) value of assets $1,760,000

The plan has fewer than 500 participants.

There have been no benefit increases in the last six years.

Consider the following statement:

The deduction limit for 2011 is greater than $725,000.

Question 47

Which of the following describes the above statement?

(A) The statement is true
(B) The statement is false
(C) There is insufficient information to determine if the statement is true or false.
**Data for Question 48** (4 points)

Assumed annual rate of return on assets: 7.0%.

Segment rates for 2009: {5.0%, 5.5%, 6.0%}.
Segment rates for 2010: {5.0%, 6.5%, 8.0%}.
Segment rates for 2011: {5.0%, 6.0%, 7.0%}.

Actuarial value of assets: Average asset valuation method allowed under IRC section 430 using annual asset values over two years of experience.

Fair value of assets as of 1/1/2009: $1,700,000.
Fair value of assets as of 1/1/2010: $2,500,000.
Fair value of assets as of 1/1/2011: $2,450,000.

Contribution paid on 7/1/2009 for the 2009 plan year: $62,000.
Contribution paid on 7/1/2010 for the 2010 plan year: $66,000.

Benefit payments paid on 7/1/2009: $31,000.
Benefit payments paid on 7/1/2010: $33,000.

---

**Question 48**

In what range is the actuarial value of assets as of 1/1/2011?

(A) Less than $2,395,000

(B) $2,395,000 but less than $2,400,000

(C) $2,400,000 but less than $2,405,000

(D) $2,405,000 but less than $2,410,000

(E) $2,410,000 or more
Data for Question 49 (4 points)

Type of plan: Multiemployer.


Normal retirement benefit: 50% of final compensation.

Actuarial cost method: Entry age normal.

Valuation interest rate: 6.0%.

Assumed rate of compensation increases: 3.0%.

Data for participant Smith:

<table>
<thead>
<tr>
<th>Date of birth</th>
<th>1/1/1961</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of hire</td>
<td>1/1/1994</td>
</tr>
<tr>
<td>2010 compensation</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

Selected annuity factor:

\[
\dd_{65}^{(12)} = 11.3119
\]

Question 49

In what range is the accrued liability for participant Smith as of 1/1/2011?

(A) Less than $200,000
(B) $200,000 but less than $215,000
(C) $215,000 but less than $230,000
(D) $230,000 but less than $245,000
(E) $245,000 or more
Data for Question 50 (5 points)

Plan effective date: 1/1/2000.

Funding standard carryover balance and prefunding balance as of 1/1/2010: $0.

Selected valuation results:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2010</th>
<th>1/1/2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding target</td>
<td>$850,000</td>
<td>$986,800</td>
</tr>
<tr>
<td>Target normal cost</td>
<td>$100,000</td>
<td>$120,000</td>
</tr>
<tr>
<td>Actuarial (market) value of assets</td>
<td>$636,000</td>
<td>$902,000</td>
</tr>
<tr>
<td>Effective interest rate</td>
<td>6.0%</td>
<td>6.0%</td>
</tr>
</tbody>
</table>

Shortfall amortization factors at both 1/1/2010 and 1/1/2011:
- 7-year shortfall amortization factor: 5.9982
- 6-year shortfall amortization factor: 5.2932

No shortfall amortization bases were established before 2010.

Contribution for the 2010 plan year on 1/1/2010: $200,000.

Actual rate of return on assets for 2010: 10.0%.

The plan sponsor is considering the following two contribution options:

Option 1: After electing to reduce the entire prefunding balance, the plan sponsor is to make a single contribution of $X on 1/1/2011 in the smallest amount that satisfies the minimum funding standard for the 2011 plan year.

Option 2: Without electing to reduce any of the prefunding balance, the plan sponsor is to make a single contribution of $Y on 1/1/2011 in the smallest amount that satisfies the minimum funding standard for the 2011 plan year.

Question 50

In what range is $X$ minus $Y$?

(A) Less than ($12,500)

(B) ($12,500) but less than $12,500

(C) $12,500 but less than $37,500

(D) $37,500 but less than $62,500

(E) $62,500 or more
Data for Question 51  (4 points)

Type of plan: Multiemployer.

Plan effective date: 1/1/2010.

Actuarial cost method: Entry age normal.

Asset value method: Market value of assets.

Valuation interest rate: 7.0%.

Selected valuation results:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2010</th>
<th>1/1/2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accrued liability</td>
<td>$1,000,000</td>
<td>$1,184,000</td>
</tr>
<tr>
<td>Normal cost</td>
<td>$200,000</td>
<td>$220,000</td>
</tr>
<tr>
<td>Actuarial (market) value of assets</td>
<td>$0</td>
<td></td>
</tr>
</tbody>
</table>

A single contribution of $350,000 was made on 12/31/2010 for the 2010 plan year.

There were no benefit distributions or expenses paid from plan assets during 2010.

A single contribution of \( X \) is made on 12/31/2011 in the **smallest amount that satisfies the minimum funding standard** for the 2011 plan year.

---

Question 51

In what range is \( X \)?

(A) Less than $185,000

(B) $185,000 but less than $225,000

(C) $225,000 but less than $265,000

(D) $265,000 but less than $305,000

(E) $305,000 or more
Data for Question 52 (2 points)

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

**ASSERTION**
Anticipated rates of retirement may be lower than the long-term rates of retirement for a period after the expiration of an early retirement window with enhanced retirement benefits.

**REASON**
Participants who did not opt to retire under the early retirement window are generally less likely to retire for a period after the expiration of the early retirement window.

---

**Question 52**

Which of the following statement is true?

(A) Both the assertion and the reason are true statements and the reason is a correct explanation of the assertion.

(B) Both the assertion and the reason are true statements and the reason is NOT a correct explanation of the assertion.

(C) The assertion is a true statement, but the reason is a false statement.

(D) The assertion is a false statement, but the reason is a true statement.

(E) Both the assertion and the reason are false statements.

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**END OF EXAMINATION**
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