

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

**ENROLLED ACTUARIES PENSION EXAMINATION, SEGMENT F**

**NOVEMBER 2015 EA-2, SEGMENT F, EXAMINATION**

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## **IMPORTANT**

**THESE FACTORS MAY BE USED FOR ALL QUESTIONS UNLESS OTHER FACTORS ARE PROVIDED,  
FOR BOTH SINGLE EMPLOYER AND MULTIEMPLOYER PLANS**

### **2015 EA-2 (Segment F) Examination - Selected Commutation Factors Interest Rates: 3.0%, 4.0%, and 5.0%**

| MALES | Interest Rate = 3.0% |              | Interest Rate = 4.0% |              | Interest Rate = 5.0% |              | MALES |
|-------|----------------------|--------------|----------------------|--------------|----------------------|--------------|-------|
| Age   | $D_x$                | $N_x^{(12)}$ | $D_x$                | $N_x^{(12)}$ | $D_x$                | $N_x^{(12)}$ | Age   |
| 60    | 162,371              | 2,658,791    | 90,937               | 1,340,228    | 51,213               | 684,044      | 60    |
| 61    | 156,901              | 2,498,928    | 87,029               | 1,251,083    | 48,545               | 634,053      | 61    |
| 62    | 151,492              | 2,344,506    | 83,220               | 1,165,800    | 45,979               | 586,684      | 62    |
| 63    | 146,148              | 2,195,463    | 79,513               | 1,084,278    | 43,512               | 541,836      | 63    |
| 64    | 140,836              | 2,051,750    | 75,886               | 1,006,428    | 41,132               | 499,414      | 64    |
| 65    | 135,583              | 1,913,322    | 72,353               | 932,161      | 38,844               | 459,331      | 65    |
| 66    | 130,379              | 1,780,124    | 68,907               | 861,387      | 36,641               | 421,497      | 66    |
| 67    | 125,183              | 1,652,127    | 65,525               | 794,031      | 34,511               | 385,832      | 67    |
| 68    | 120,037              | 1,529,303    | 62,227               | 730,017      | 32,462               | 352,260      | 68    |
| 69    | 114,973              | 1,411,587    | 59,029               | 669,256      | 30,500               | 320,698      | 69    |
| 70    | 109,959              | 1,298,912    | 55,912               | 611,656      | 28,614               | 291,062      | 70    |
| 71    | 105,032              | 1,191,212    | 52,893               | 557,128      | 26,812               | 263,274      | 71    |
| 72    | 100,146              | 1,088,419    | 49,948               | 505,585      | 25,078               | 237,257      | 72    |
| 73    | 95,292               | 990,498      | 47,069               | 456,957      | 23,407               | 212,945      | 73    |
| 74    | 90,457               | 897,422      | 44,251               | 411,179      | 21,797               | 190,276      | 74    |
| 75    | 85,635               | 809,175      | 41,490               | 368,193      | 20,242               | 169,192      | 75    |
| 76    | 80,779               | 725,766      | 38,761               | 327,954      | 18,730               | 149,643      | 76    |
| 77    | 75,938               | 647,206      | 36,087               | 290,418      | 17,272               | 131,581      | 77    |
| 78    | 71,068               | 573,500      | 33,448               | 255,541      | 15,857               | 114,958      | 78    |
| 79    | 66,174               | 504,676      | 30,846               | 223,285      | 14,484               | 99,730       | 79    |
| 80    | 61,264               | 440,752      | 28,282               | 193,614      | 13,153               | 85,856       | 80    |
| 81    | 56,348               | 381,741      | 25,763               | 166,487      | 11,868               | 73,292       | 81    |
| 82    | 51,418               | 327,652      | 23,283               | 141,860      | 10,623               | 61,995       | 82    |
| 83    | 46,499               | 278,489      | 20,853               | 119,691      | 9,424                | 51,922       | 83    |
| 84    | 41,695               | 234,192      | 18,519               | 99,909       | 8,289                | 43,018       | 84    |
| 85    | 36,971               | 194,662      | 16,263               | 82,424       | 7,210                | 35,224       | 85    |

| FEMALES | Interest Rate = 3.0% |              | Interest Rate = 4.0% |              | Interest Rate = 5.0% |              | FEMALES |
|---------|----------------------|--------------|----------------------|--------------|----------------------|--------------|---------|
| Age     | $D_x$                | $N_x^{(12)}$ | $D_x$                | $N_x^{(12)}$ | $D_x$                | $N_x^{(12)}$ | Age     |
| 60      | 163,946              | 2,815,736    | 91,820               | 1,409,832    | 51,710               | 715,452      | 60      |
| 61      | 158,455              | 2,654,307    | 87,891               | 1,319,814    | 49,026               | 664,972      | 61      |
| 62      | 153,040              | 2,498,334    | 84,071               | 1,233,674    | 46,449               | 617,127      | 62      |
| 63      | 147,696              | 2,347,743    | 80,355               | 1,151,306    | 43,973               | 571,812      | 63      |
| 64      | 142,409              | 2,202,470    | 76,734               | 1,072,610    | 41,591               | 528,931      | 64      |
| 65      | 137,188              | 2,062,454    | 73,210               | 997,492      | 39,304               | 488,388      | 65      |
| 66      | 132,027              | 1,927,631    | 69,778               | 925,855      | 37,104               | 450,092      | 66      |
| 67      | 126,914              | 1,797,948    | 66,431               | 857,611      | 34,988               | 413,958      | 67      |
| 68      | 121,864              | 1,673,349    | 63,174               | 792,673      | 32,956               | 379,901      | 68      |
| 69      | 116,876              | 1,553,771    | 60,006               | 730,951      | 31,005               | 347,839      | 69      |
| 70      | 111,948              | 1,439,153    | 56,923               | 672,358      | 29,132               | 317,693      | 70      |
| 71      | 107,073              | 1,329,440    | 53,921               | 616,811      | 27,333               | 289,385      | 71      |
| 72      | 102,271              | 1,224,568    | 51,007               | 564,226      | 25,610               | 262,842      | 72      |
| 73      | 97,500               | 1,124,484    | 48,160               | 514,523      | 23,950               | 237,993      | 73      |
| 74      | 92,792               | 1,029,141    | 45,394               | 467,631      | 22,359               | 214,773      | 74      |
| 75      | 88,114               | 938,493      | 42,691               | 423,476      | 20,828               | 193,115      | 75      |
| 76      | 83,512               | 852,489      | 40,072               | 381,985      | 19,364               | 172,959      | 76      |
| 77      | 78,949               | 771,068      | 37,519               | 343,083      | 17,957               | 154,239      | 77      |
| 78      | 74,383               | 694,211      | 35,009               | 306,715      | 16,596               | 136,906      | 78      |
| 79      | 69,860               | 621,902      | 32,564               | 272,827      | 15,290               | 120,908      | 79      |
| 80      | 65,379               | 554,096      | 30,182               | 241,355      | 14,037               | 106,193      | 80      |
| 81      | 60,944               | 490,749      | 27,864               | 212,235      | 12,836               | 92,706       | 81      |
| 82      | 56,559               | 431,815      | 25,610               | 185,403      | 11,685               | 80,398       | 82      |
| 83      | 52,225               | 377,242      | 23,421               | 160,797      | 10,584               | 69,218       | 83      |
| 84      | 47,950               | 326,976      | 21,297               | 138,349      | 9,533                | 59,115       | 84      |
| 85      | 43,741               | 280,955      | 19,241               | 117,995      | 8,530                | 50,042       | 85      |

## IMPORTANT

THESE FACTORS MAY BE USED FOR ALL QUESTIONS UNLESS OTHER FACTORS ARE PROVIDED,  
FOR BOTH SINGLE EMPLOYER AND MULTIEMPLOYER PLANS

### 2015 EA-2 (Segment F) Examination - Selected Commutation Factors Interest Rates: 5.0%, 6.0%, and 7.0%

| MALES | Interest Rate = 5.0% |              | Interest Rate = 6.0% |              | Interest Rate = 7.0% |              | MALES |
|-------|----------------------|--------------|----------------------|--------------|----------------------|--------------|-------|
| Age   | $D_x$                | $N_x^{(12)}$ | $D_x$                | $N_x^{(12)}$ | $D_x$                | $N_x^{(12)}$ | Age   |
| 60    | 51,213               | 684,044      | 28,999               | 353,283      | 16,509               | 184,514      | 60    |
| 61    | 48,545               | 634,053      | 27,229               | 325,094      | 15,356               | 168,534      | 61    |
| 62    | 45,979               | 586,684      | 25,547               | 298,636      | 14,273               | 153,674      | 62    |
| 63    | 43,512               | 541,836      | 23,948               | 273,822      | 13,254               | 139,868      | 63    |
| 64    | 41,132               | 499,414      | 22,424               | 250,573      | 12,295               | 127,054      | 64    |
| 65    | 38,844               | 459,331      | 20,977               | 228,812      | 11,394               | 115,172      | 65    |
| 66    | 36,641               | 421,497      | 19,601               | 208,466      | 10,547               | 104,166      | 66    |
| 67    | 34,511               | 385,832      | 18,287               | 189,467      | 9,748                | 93,985       | 67    |
| 68    | 32,462               | 352,260      | 17,039               | 171,752      | 8,998                | 84,580       | 68    |
| 69    | 30,500               | 320,698      | 15,858               | 155,254      | 8,296                | 75,904       | 69    |
| 70    | 28,614               | 291,062      | 14,738               | 139,909      | 7,638                | 67,909       | 70    |
| 71    | 26,812               | 263,274      | 13,679               | 125,657      | 7,023                | 60,553       | 71    |
| 72    | 25,078               | 237,257      | 12,673               | 112,439      | 6,446                | 53,795       | 72    |
| 73    | 23,407               | 212,945      | 11,718               | 100,203      | 5,904                | 47,597       | 73    |
| 74    | 21,797               | 190,276      | 10,808               | 88,902       | 5,395                | 41,927       | 74    |
| 75    | 20,242               | 169,192      | 9,943                | 78,491       | 4,917                | 36,751       | 75    |
| 76    | 18,730               | 149,643      | 9,113                | 68,928       | 4,464                | 32,042       | 76    |
| 77    | 17,272               | 131,581      | 8,325                | 60,176       | 4,040                | 27,772       | 77    |
| 78    | 15,857               | 114,958      | 7,570                | 52,197       | 3,639                | 23,915       | 78    |
| 79    | 14,484               | 99,730       | 6,850                | 44,957       | 3,262                | 20,449       | 79    |
| 80    | 13,153               | 85,856       | 6,162                | 38,423       | 2,907                | 17,349       | 80    |
| 81    | 11,868               | 73,292       | 5,507                | 32,561       | 2,574                | 14,595       | 81    |
| 82    | 10,623               | 61,995       | 4,883                | 27,340       | 2,261                | 12,164       | 82    |
| 83    | 9,424                | 51,922       | 4,291                | 22,728       | 1,968                | 10,037       | 83    |
| 84    | 8,289                | 43,018       | 3,739                | 18,691       | 1,699                | 8,193        | 84    |
| 85    | 7,210                | 35,224       | 3,221                | 15,189       | 1,450                | 6,608        | 85    |

| FEMALES | Interest Rate = 5.0% |              | Interest Rate = 6.0% |              | Interest Rate = 7.0% |              | FEMALES |
|---------|----------------------|--------------|----------------------|--------------|----------------------|--------------|---------|
| Age     | $D_x$                | $N_x^{(12)}$ | $D_x$                | $N_x^{(12)}$ | $D_x$                | $N_x^{(12)}$ | Age     |
| 60      | 51,710               | 715,452      | 29,281               | 367,702      | 16,669               | 191,248      | 60      |
| 61      | 49,026               | 664,972      | 27,499               | 339,237      | 15,508               | 175,111      | 61      |
| 62      | 46,449               | 617,127      | 25,808               | 312,513      | 14,418               | 160,103      | 62      |
| 63      | 43,973               | 571,812      | 24,202               | 287,442      | 13,395               | 146,153      | 63      |
| 64      | 41,591               | 528,931      | 22,675               | 263,940      | 12,432               | 133,200      | 64      |
| 65      | 39,304               | 488,388      | 21,225               | 241,929      | 11,529               | 121,181      | 65      |
| 66      | 37,104               | 450,092      | 19,849               | 221,335      | 10,680               | 110,041      | 66      |
| 67      | 34,988               | 413,958      | 18,540               | 202,086      | 9,883                | 99,726       | 67      |
| 68      | 32,956               | 379,901      | 17,298               | 184,115      | 9,135                | 90,186       | 68      |
| 69      | 31,005               | 347,839      | 16,121               | 167,356      | 8,434                | 81,372       | 69      |
| 70      | 29,132               | 317,693      | 15,004               | 151,747      | 7,776                | 73,240       | 70      |
| 71      | 27,333               | 289,385      | 13,945               | 137,229      | 7,159                | 65,747       | 71      |
| 72      | 25,610               | 262,842      | 12,942               | 123,744      | 6,583                | 58,852       | 72      |
| 73      | 23,950               | 237,993      | 11,989               | 111,238      | 6,041                | 52,517       | 73      |
| 74      | 22,359               | 214,773      | 11,087               | 99,662       | 5,534                | 46,709       | 74      |
| 75      | 20,828               | 193,115      | 10,231               | 88,968       | 5,059                | 41,392       | 75      |
| 76      | 19,364               | 172,959      | 9,422                | 79,108       | 4,615                | 36,537       | 76      |
| 77      | 17,957               | 154,239      | 8,655                | 70,037       | 4,200                | 32,111       | 77      |
| 78      | 16,596               | 136,906      | 7,924                | 61,718       | 3,809                | 28,090       | 78      |
| 79      | 15,290               | 120,908      | 7,231                | 54,112       | 3,444                | 24,449       | 79      |
| 80      | 14,037               | 106,193      | 6,576                | 47,181       | 3,103                | 21,161       | 80      |
| 81      | 12,836               | 92,706       | 5,956                | 40,889       | 2,784                | 18,205       | 81      |
| 82      | 11,685               | 80,398       | 5,371                | 35,201       | 2,487                | 15,557       | 82      |
| 83      | 10,584               | 69,218       | 4,819                | 30,083       | 2,211                | 13,197       | 83      |
| 84      | 9,533                | 59,115       | 4,300                | 25,502       | 1,954                | 11,104       | 84      |
| 85      | 8,530                | 50,042       | 3,811                | 21,426       | 1,716                | 9,259        | 85      |

**2014 EA-2 (Segment F) Examination - Selected Amortization Factors**

**Segment Rates = {3.0%, 4.0%, 5.0%}**

| <b><u>Remaining Period</u></b> | <b><u>Amortization Factor</u></b> |
|--------------------------------|-----------------------------------|
| 7 years                        | 6.3293                            |
| 6 years                        | 5.5390                            |
| 5 years                        | 4.7171                            |
| 4 years                        | 3.8286                            |
| 3 years                        | 2.9135                            |
| 2 years                        | 1.9709                            |

**Segment Rates = {5.0%, 6.0%, 7.0%}**

| <b><u>Remaining Period</u></b> | <b><u>Amortization Factor</u></b> |
|--------------------------------|-----------------------------------|
| 7 years                        | 5.9982                            |
| 6 years                        | 5.2932                            |
| 5 years                        | 4.5460                            |
| 4 years                        | 3.7232                            |
| 3 years                        | 2.8594                            |
| 2 years                        | 1.9524                            |

**LIMITS AND TABLES**  
(Included with the 2015 EA-2 (Segment F) examination)

| <b>Maximum Benefit Limit<br/>IRC section 415(b)</b> |                      |
|---|----------------------|
| <u>Year</u>   | <u>Limit at SSRA</u> |
| 2000  | 135,000              |
| 2001  | 140,000              |
| <u>Year</u>   | <u>Limit at 65</u>   |
| 2002-2003   | 160,000              |
| 2004  | 165,000              |
| 2005  | 170,000              |
| 2006  | 175,000              |
| 2007  | 180,000              |
| 2008  | 185,000              |
| 2009-2011   | 195,000              |
| 2012  | 200,000              |
| 2013  | 205,000              |
| 2014-2015   | 210,000              |

| <b>Compensation Limit<br/>IRC section 401(a)(17)</b> |              |
|--|--------------|
| <u>Year</u>  | <u>Limit</u> |
| 2000-2001  | 170,000      |
| 2002-2003  | 200,000      |
| 2004   | 205,000      |
| 2005   | 210,000      |
| 2006   | 220,000      |
| 2007   | 225,000      |
| 2008   | 230,000      |
| 2009-2011  | 245,000      |
| 2012   | 250,000      |
| 2013   | 255,000      |
| 2014   | 260,000      |
| 2015   | 265,000      |

| <b>Key Employee Compensation<br/>IRC section 416</b> |                |                 |
|--|----------------|-----------------|
| <u>Year</u>  | <u>Officer</u> | <u>1% owner</u> |
| 2003   | 130,000        | 150,000         |
| 2004   | 130,000        | 150,000         |
| 2005   | 135,000        | 150,000         |
| 2006   | 140,000        | 150,000         |
| 2007   | 145,000        | 150,000         |
| 2008   | 150,000        | 150,000         |
| 2009-2011  | 160,000        | 150,000         |
| 2012-2013  | 165,000        | 150,000         |
| 2014-2015  | 170,000        | 150,000         |

| <b>Highly Compensated Employee<br/>Compensation<br/>IRC section 414(q)</b> |              |
|--|--------------|
| <u>Year</u>  | <u>Limit</u> |
| 2000-2001  | 85,000       |
| 2002-2004  | 90,000       |
| 2005   | 95,000       |
| 2006   | 100,000      |
| 2007   | 100,000      |
| 2008   | 105,000      |
| 2009-2011  | 110,000      |
| 2012-2014  | 115,000      |
| 2015   | 120,000      |

2015

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

2015

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



2015

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

## 2015

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

2015

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

2015

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

2015

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

2015

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

2015

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

2015

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



# 2015

## 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

2015

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

2015

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

2015

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

2015

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

## 2015

### 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

2015

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

# 2015

## 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



2015

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

## 2015

### 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

2015

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

## 2015

### 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

2015

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

2015

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

2015

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

2015

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



2015

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

2015

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

2015

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

# 2015

## 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

2015

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

2015

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

2015

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

## 2015

### 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



2015

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

## 2015

### 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

## 2015

### 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

# 2015

## 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

## 2015

### 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

2015

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

2015

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

2015

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



2015

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

2015

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

2015

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

2015

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

2015

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

# 2015

## 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

2015

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

2015

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



## 2015

### 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

2015

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

## 2015

### 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

2015

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

2015

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

## 2015

### 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

2015

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

**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>      |  |                 |               |