Data for Question 1 (1 point)

Consider the following statement with respect to the actuarial value of assets:

A change in the date used for determining the value of assets is a change in funding method.

Question 1

Is the above statement true or false?

(A) True

(B) False

Data for Question 2 (1 point)

A single employer plan had more than 100 participants in 2003.

The plan’s gateway funded current liability percentages for 2004 and each of the three preceding years are as follows:

<table>
<thead>
<tr>
<th>Plan Year</th>
<th>Gateway %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>85%</td>
</tr>
<tr>
<td>2003</td>
<td>92%</td>
</tr>
<tr>
<td>2002</td>
<td>89%</td>
</tr>
<tr>
<td>2001</td>
<td>95%</td>
</tr>
</tbody>
</table>

Consider the following statement:

The plan is subject to the additional required funding charge for the 2004 plan year.

Question 2

Is the above statement true or false?

(A) True

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

A single employer plan has funded current liability percentages of 98% for 2003 and 105% for 2004.

Consider the following statement:

The plan is exempt from the quarterly contribution requirement for 2004.

Question 3

Is the above statement true or false?

(A) True

(B) False
2004

Data for Question 4 (3 points)

Normal retirement benefit:

Prior to 2004 $30 per month for each year of service.
After 2003 $30 per month for each year of service as of 1/1/2004, plus $33 per month for each year of service after 1/1/2004.

Actuarial cost method: Attained age normal.

Selected valuation results as of 1/1/2004 before plan change:

- Present value of future benefits: $2,900,000
- Unit credit accrued liability: 1,500,000
- Present value of future service: 16,000
- Number of active participants: 1,000

All participants are active employees.

Question 4

In what range is the increase in the normal cost as of 1/1/2004 as a result of the plan amendment?

(A) Less than $9,000
(B) $9,000 but less than $12,000
(C) $12,000 but less than $15,000
(D) $15,000 but less than $18,000
(E) $18,000 or more
2004

Data for Question 5 (3 points)

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

Early retirement benefit: None.

Plan vesting schedule:

<table>
<thead>
<tr>
<th>Years of service</th>
<th>Percent vested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 3</td>
<td>0%</td>
</tr>
<tr>
<td>3</td>
<td>20%</td>
</tr>
<tr>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td>5</td>
<td>60%</td>
</tr>
<tr>
<td>6</td>
<td>80%</td>
</tr>
<tr>
<td>7 or more</td>
<td>100%</td>
</tr>
</tbody>
</table>

Actuarial cost method: Unit credit.

Selected actuarial assumptions:

Valuation interest rate 7% per year
Pre-retirement turnover rates Age Rate
63 0.06
64 0.00
65 1.00

Other pre-retirement decrements None

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

Data for participant Smith as of 1/1/2004: Date of birth 1/1/1941
Date of hire 1/1/1999

Selected annuity value: $$\ddot{a}_{65}^{(12)} = 9.24$$

Question 5

In what range is the total normal cost for Smith as of 1/1/2004?

(A) Less than $3,600
(B) $3,600 but less than $3,700
(C) $3,700 but less than $3,800
(D) $3,800 but less than $3,900
(E) $3,900 or more
2004

Data for Question 6 (4 points)

Actuarial cost method: Aggregate.

Normal retirement benefit: 2% of final three-year average compensation for each year of service.

Valuation interest rate: 7% per year.

Assumed compensation increases: 4% per year.

All participants are active and under age 60 on 1/1/2003.

Credit balance as of 12/31/2002: $0.

Selected valuation results as of 1/1/2003:

- Present value of future benefits: $200,000
- Compensation: 100,000
- Present value of future compensation: $1,500,000
- Actuarial (market) value of assets: 50,000

During 2003, the following occurred:

- Compensation increases for all participants were 3%
- Return on assets was 5%
- The minimum required contribution for 2003 was paid on 12/31/2003
- There were no deaths, terminations, or new entrants

Question 6

In what range is the normal cost for 2004 as of 1/1/2004?

(A) Less than $10,000
(B) $10,000 but less than $10,100
(C) $10,100 but less than $10,200
(D) $10,200 but less than $10,300
(E) $10,300 or more
Data for Question 7 (3 points)

Actuarial cost method: Aggregate.

Valuation interest rate: 7% per year.

Current liability interest rate: 6.55% per year.

Credit balance in the funding standard account as of 12/31/2003: $0.

Selected valuation results as of 1/1/2004:

- Normal cost: $12,000
- Entry age normal cost: 10,000
- Entry age normal accrued liability: 105,000
- Current liability: 75,000
- Expected increase in current liability for 2004: 11,000
- Actuarial value of assets: 108,000
- Market value of assets: 90,000
- Benefit payments expected to be paid in 2004: 0

Question 7

In what range is the full funding limitation under IRC section 412 for 2004?

(A) Less than $12,500

(B) $12,500 but less than $17,500

(C) $17,500 but less than $22,500

(D) $22,500 but less than $27,500

(E) $27,500 or more
Data for Question 8 (5 points)

Plan effective date: 1/1/2003.

Normal retirement benefit: $30 per month for each of the first 10 years of service, plus $35 per month for each year of service thereafter.

Actuarial cost method: Unit credit.

Valuation interest rate:
- Prior to 2004: 7% per year
- After 2003: 5% per year

Credit balance in funding standard account as of 12/31/2003: $0.

There have been no experience gains or losses.

Data for sole participant:
- Date of birth: 1/1/1964
- Date of hire: 1/1/1988

Selected annuity values:
\[
\begin{array}{c|c|c}
\text{Interest Rate} & \text{Annuity Value} \\
\hline
7\% & 9.75 \\
5\% & 11.50 \\
\end{array}
\]

Question 8

In what range is the minimum required contribution for 2004 as of 12/31/2004?

(A) Less than $3,150
(B) $3,150 but less than $3,250
(C) $3,250 but less than $3,350
(D) $3,350 but less than $3,450
(E) $3,450 or more
2004

**Data for Question 9 (4 points)**

Plan effective date: 1/1/1998.

Actuarial cost method: Frozen initial liability.

Valuation interest rate: 7% per year.

Selected valuation results and funding standard account entries as of 1/1/2004:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outstanding amortization base for initial unfunded liability</td>
<td>$2,850,000</td>
</tr>
<tr>
<td>Present value of projected benefits</td>
<td>$9,750,000</td>
</tr>
<tr>
<td>Present value of future compensation</td>
<td>$22,675,000</td>
</tr>
<tr>
<td>2004 compensation</td>
<td>$2,000,000</td>
</tr>
<tr>
<td>Actuarial value of assets</td>
<td>$2,850,000</td>
</tr>
</tbody>
</table>

At the end of each plan year, a contribution is made equal to the normal cost plus amortization of the initial unfunded liability over 25 years.

**Question 9**

In what range is the minimum required contribution for 2004 as of 12/31/2004?

(A) Less than $475,000

(B) $475,000 but less than $525,000

(C) $525,000 but less than $575,000

(D) $575,000 but less than $625,000

(E) $625,000 or more
2004

Data for Question 10 (4 points)

Plan effective date: 1/1/2002.

Actuarial cost method: Unit credit.

Initial accrued liability: $450,000.

Valuation interest rate:
   Prior to 2004  7% per year
   After 2003  6% per year

Credit balance in funding standard account as of 12/31/2003: $5,200.

Normal cost as of 1/1/2004: $30,000.

Experience (gain) in 2002: ($40,000).

Experience loss in 2003: $70,000.

Increase in liability due to assumption change effective 1/1/2004: $80,000.


Question 10

In what range is the credit balance in the funding standard account as of 12/31/2004?

(A) Less than $13,650

(B) $13,650 but less than $15,650

(C) $15,650 but less than $17,650

(D) $17,650 but less than $19,650

(E) $19,650 or more
Data for Question 11 (3 points)

Actuarial cost method: Unit credit.

Valuation interest rate: 7% per year.

Selected valuation results:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2003</th>
<th>1/1/2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accrued liability</td>
<td>$120,000</td>
<td>$125,000</td>
</tr>
<tr>
<td>Normal cost</td>
<td>10,000</td>
<td>12,000</td>
</tr>
<tr>
<td>Actuarial (market) value of assets</td>
<td>120,000</td>
<td>110,000</td>
</tr>
<tr>
<td>Benefits paid (mid-year)</td>
<td>20,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>


x = Total experience loss for 2003.
y = Asset loss for 2003.

Question 11

In what range is y/x?

(A) Less than 77.0%

(B) 77.0% but less than 82.0%

(C) 82.0% but less than 87.0%

(D) 87.0% but less than 92.0%

(E) 92.0% or more
Data for Question 12 (3 points)

Plan effective date: 1/1/1990.

Actuarial cost method: Entry age normal.

Normal retirement benefit: 5% of final pay per year of service (maximum of 20 years).

Selected actuarial assumptions:

\[
\begin{align*}
\text{Valuation interest rate} & \quad 7\% \text{ per year} \\
\text{Compensation increases} & \quad 3.5\% \text{ per year}
\end{align*}
\]

Data for participant Smith:

Date of birth 1/1/1942
Date of hire 1/1/2003

Projected retirement benefit at age 65: $1,000 per month.

Selected annuity value:

\[
\begin{align*}
\hat{a}_{65}^{(12)} = 12.41
\end{align*}
\]

**Question 12**

In what range is Smith’s normal cost as of 1/1/2004?

(A) Less than $31,000

(B) $31,000 but less than $36,000

(C) $36,000 but less than $41,000

(D) $41,000 but less than $46,000

(E) $46,000 or more
Data for Question 13 (5 points)

Normal retirement benefit: $50 per month for each year of service.
Early retirement benefit: Immediate unreduced benefit.
Early retirement eligibility: 30 years of service.
Vesting schedule: 5-year cliff.
Actuarial cost method: Entry age normal.
Valuation interest rate: 7% per year.
Assumed retirement age: 65.

Data for all plan participants:

<table>
<thead>
<tr>
<th>Name</th>
<th>Date of birth</th>
<th>Date of hire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith</td>
<td>1/1/1944</td>
<td>1/1/1974</td>
</tr>
<tr>
<td>Jones</td>
<td>1/1/1959</td>
<td>1/1/1989</td>
</tr>
</tbody>
</table>

Jones terminated effective 10/1/2003.

Lump sum distribution paid to Jones on 12/31/2003: $50,000.

Smith retired on 12/31/2003 and began receiving annuity benefits immediately.

Selected annuity values:

\[
\dd_{60}^{(12)} = 10.38 \\
\dd_{65}^{(12)} = 9.24
\]

Question 13

In what range is the liability loss for 2003 as of 1/1/2004?

(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
Data for Question 14 (4 points)

Actuarial cost method: Aggregate.

Normal retirement benefit: 50% of final compensation, reduced pro rata for years of service less than 20.

Selected actuarial assumptions:

- Valuation interest rate: 7% per year
- Compensation increases: 0% per year

Credit balance in funding standard account as of 12/31/2003: $5,000.

Actuarial (market) value of assets as of 1/1/2004: $50,000.

Data for all plan participants as of 1/1/2004:

<table>
<thead>
<tr>
<th></th>
<th>Smith</th>
<th>Jones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compensation for 2003</td>
<td>$25,000</td>
<td>$150,000</td>
</tr>
<tr>
<td>Age</td>
<td>25</td>
<td>51</td>
</tr>
<tr>
<td>Years of service</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

Selected annuity value:

\[ \ddot{a}_{65}^{(12)} = 10.00 \]

Question 14

In what range is the normal cost for IRC section 412 as of 12/31/2004?

(A) Less than $21,000

(B) $21,000 but less than $23,000

(C) $23,000 but less than $25,000

(D) $25,000 but less than $27,000

(E) $27,000 or more
2004

Data for Question 15 (3 points)

Valuation interest rate: 7% per year.

Credit balance in the funding standard account as of 12/31/2002: $50,000.

Funding standard account entries:

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal cost as of 1/1</td>
<td>$70,000</td>
<td>$105,000</td>
</tr>
<tr>
<td>Net amortization charges as of 1/1</td>
<td>150,000</td>
<td>360,000</td>
</tr>
<tr>
<td>Additional funding charge as of 12/31</td>
<td>80,000</td>
<td>0</td>
</tr>
<tr>
<td>Full funding credit as of 12/31</td>
<td>0</td>
<td>100,000</td>
</tr>
<tr>
<td>Late interest charges as of 12/31</td>
<td>20,000</td>
<td></td>
</tr>
</tbody>
</table>

The minimum required contribution for 2003 was paid 9/15/2004.

Question 15

In what range is the required quarterly installment for 2004?

(A) Less than $80,750

(B) $80,750 but less than $81,750

(C) $81,750 but less than $82,750

(D) $82,750 but less than $83,750

(E) $83,750 or more
Data for Question 16 (5 points)

Plan effective date: 1/1/1980.

Valuation interest rate: 7% per year.

Current liability interest rate for 1/1/2003: 6% per year.

Accumulated funding deficiency as of 12/31/2002: $30,000.

Reconciliation account balance as of 1/1/2003: $75,000.

Selected valuation results as of 1/1/2003:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal cost</td>
<td>$110,000</td>
</tr>
<tr>
<td>Net amortization charges in funding standard account</td>
<td>20,000</td>
</tr>
<tr>
<td>Actuarial (market) value of assets</td>
<td>1,100,000</td>
</tr>
<tr>
<td>Current liability</td>
<td>1,375,000</td>
</tr>
<tr>
<td>Expected increase in current liability for 2003</td>
<td>114,000</td>
</tr>
<tr>
<td>Current liability at maximum interest rate</td>
<td>1,325,000</td>
</tr>
</tbody>
</table>

The applicable percentage of unfunded new liability is defined by the following formula, where FCL% is the funded current liability percentage:

\[ 30\% - [(FCL\% - 60\%, \text{not less than } 0\%) \times 0.4] \]

Additional interest charge for late quarterly contributions for 2003: $5,000.

Maximum number of participants during 2002: 140.
Maximum number of participants during 2003: 130.

The funded current liability percentage has never been greater than 90%.

Question 16

In what range is the accumulated reconciliation account as of 1/1/2004?

(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
2004

Data for Question 17 (4 points)

Actuarial cost method: Unit credit.

Valuation interest rate: 7% per year.

Credit balance in the funding standard account as of 12/31/2003: $15,000.

Selected valuation results as of 1/1/2004:

- Accrued liability: $800,000
- Actuarial (market) value of assets: 600,000

Amortization charges and (credits) for all bases in funding standard account as of 1/1/2004:

- Actuarial (gain)/loss during 2001 plan year: $X
- Plan amendment effective 1/1/2002: 4,200
- Actuarial (gain)/loss during 2002 plan year: 25,000
- Actuarial (gain)/loss during 2003 plan year: 33,000

Total reconciliation account balance as of 1/1/2004: $20,000.

Question 17

In what range is the absolute value of $X?

(A) Less than $10,000

(B) $10,000 but less than $15,000

(C) $15,000 but less than $20,000

(D) $20,000 but less than $25,000

(E) $25,000 or more
Data for Question 18 (3 points)


Actuarial cost method: Frozen initial liability.

Valuation interest rate:

<table>
<thead>
<tr>
<th>Year</th>
<th>Interest Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 2004</td>
<td>6% per year</td>
</tr>
<tr>
<td>After 2003</td>
<td>7% per year</td>
</tr>
</tbody>
</table>

Credit balance in the funding standard account as of 12/31/2003: $40,000.

Selected valuation results as of 1/1/2004:

<table>
<thead>
<tr>
<th></th>
<th>6%</th>
<th>7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal cost</td>
<td>$80,000</td>
<td>$60,000</td>
</tr>
<tr>
<td>Unfunded liability</td>
<td>240,000</td>
<td>160,000</td>
</tr>
</tbody>
</table>

Question 18

In what range is the minimum required contribution for 2004 as of 12/31/2004?

(A) Less than $33,000

(B) $33,000 but less than $34,000

(C) $34,000 but less than $35,000

(D) $35,000 but less than $36,000

(E) $36,000 or more
Data for Question 19 (4 points)

Plan effective date: 1/1/2003.

Actuarial cost method: Entry age normal.

Valuation interest rate: 7% per year.

Selected valuation results:

<table>
<thead>
<tr>
<th></th>
<th>1/1/2003</th>
<th>1/1/2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal cost</td>
<td>$45,000</td>
<td>$35,000</td>
</tr>
<tr>
<td>Accrued liability</td>
<td>350,000</td>
<td>370,000</td>
</tr>
</tbody>
</table>

There were no benefit payments during 2003.

A contribution equal to the deductible limit for 2003 was made on 12/31/2003.

Question 19

In what range is the minimum required contribution for 2004 as of 12/31/2004?

(A) Less than $25,000

(B) $25,000 but less than $30,000

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

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

(E) $40,000 or more
2004

Data for Question 20 (3 points)

Actuarial cost method: Frozen initial liability.

Valuation interest rate: 7% per year.

Credit balance in funding standard account as of 12/31/2003: $2,000.

Selected valuation results for IRC section 412 purposes as of 1/1/2004:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal cost</td>
<td>$55,000</td>
</tr>
<tr>
<td>Unfunded actuarial liability</td>
<td>275,000</td>
</tr>
<tr>
<td>Actuarial value of assets</td>
<td>200,000</td>
</tr>
<tr>
<td>Market value of assets</td>
<td>185,000</td>
</tr>
<tr>
<td>Entry age normal cost</td>
<td>59,000</td>
</tr>
<tr>
<td>Entry age normal accrued liability</td>
<td>288,000</td>
</tr>
</tbody>
</table>

Contribution for 2004 minimum funding purposes paid on 1/1/2004 (not reflected in the above asset values): $20,000.

Portion of the 1/1/2004 contribution deducted for calendar year 2003: $12,000.

Question 20

In what range is the IRC section 404 full funding limitation for 2004?

(A) Less than $147,500

(B) $147,500 but less than $155,000

(C) $155,000 but less than $162,500

(D) $162,500 but less than $170,000

(E) $170,000 or more
2004

Data for Question 21 (5 points)

Plan effective date: 1/1/2001.

Actuarial cost method: Unit credit.

Valuation interest rate: 7% per year.

Credit balance in funding standard account as of 12/31/2003: $10,000.

Reconciliation account balance as of 1/1/2004: $5,000.

Selected valuation results as of 1/1/2004:

- Actuarial (market) value of assets: $1,100,000
- Accrued liability after assumption change: $2,000,000
- Normal cost after assumption change: $100,000
- IRC section 412 amortization charges for:
  - Initial unfunded liability: $65,000
  - 1/1/2004 assumption change: $15,000
- Expected benefit payments: $0

Current liability (including expected increase for the year) adjusted to 12/31/2004: $1,410,000.

No experience gains or losses occurred prior to the 2003 plan year.

A contribution equal to the deductible limit for 2004 was contributed on 12/31/2004.

Question 21

In what range is the credit balance as of 12/31/2004?

(A) Less than $59,000
(B) $59,000 but less than $62,000
(C) $62,000 but less than $65,000
(D) $65,000 but less than $68,000
(E) $68,000 or more
Normal retirement benefit: $25 per month for each year of service.

Early retirement benefit: Accrued benefit reduced by 6% for each year by which the benefit commencement age precedes age 65.

Early retirement eligibility: Age 60.

Actuarial cost method: Unit credit.

Selected actuarial assumptions:

<table>
<thead>
<tr>
<th>Data for sole participant as of 1/1/2004:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of birth</td>
</tr>
<tr>
<td>Date of hire</td>
</tr>
<tr>
<td>Date of retirement</td>
</tr>
</tbody>
</table>

Selected annuity values:

\[
\dd{63} = 9.72 \quad \dd{64} = 9.48 \quad \dd{65} = 9.24
\]

Question 22

In what range is the absolute value of the experience (gain)/loss as of 1/1/2004 due to the retirement?

(A) Less than $1,000

(B) $1,000 but less than $5,000

(C) $5,000 but less than $9,000

(D) $9,000 but less than $13,000

(E) $13,000 or more
Data for Question 23 (4 points)

Plan effective date: 1/1/1996.

Actuarial cost method: Unit credit.

Valuation interest rate: 7% per year.

Current liability interest rate: 6.55% per year.

Credit balance in funding standard account as of 12/31/2003: $17,700.

Selected valuation results and funding standard account items as of 1/1/2004:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal cost</td>
<td>$27,000</td>
</tr>
<tr>
<td>Current liability</td>
<td>450,000</td>
</tr>
<tr>
<td>Expected increase in current liability for the year</td>
<td>25,000</td>
</tr>
<tr>
<td>Amortization charges</td>
<td>3,500</td>
</tr>
<tr>
<td>Amortization credits</td>
<td>(11,000)</td>
</tr>
<tr>
<td>Actuarial value of assets</td>
<td>350,000</td>
</tr>
<tr>
<td>Market value of assets</td>
<td>360,000</td>
</tr>
</tbody>
</table>

There have always been at least 150 participants in the plan.

The applicable percentage of unfunded new liability is defined by the following formula, where FCL% is the funded current liability percentage:

$$30\% - [(FCL\% - 60\%, \text{not less than } 0\%) \times 0.4]\$$

Question 23

In what range is the additional funding charge for 2004?

(A) Less than $27,000

(B) $27,000 but less than $30,000

(C) $30,000 but less than $33,000

(D) $33,000 but less than $36,000

(E) $36,000 or more
2004

Data for Question 24 (4 points)


Actuarial cost method: Unit credit.

Valuation interest rate: 7% per year.

Credit balance as of 12/31/2003: $10,000.

Selected valuation results as of 1/1/2004:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal cost</td>
<td>$75,000</td>
</tr>
<tr>
<td>Accrued liability</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Actuarial (market) value of assets</td>
<td>800,000</td>
</tr>
<tr>
<td>Current liability</td>
<td>720,000</td>
</tr>
</tbody>
</table>

Current liability (including expected increase for the year) adjusted to 12/31/2004: $800,000.

All prior amortization bases were considered fully amortized as of 12/31/2003.

A contribution equal to the deductible limit for 2004 was paid on 7/1/2004.

Question 24

In what range is the deductible limit for 2004?

(A) Less than $107,000
(B) $107,000 but less than $112,000
(C) $112,000 but less than $117,000
(D) $117,000 but less than $122,000
(E) $122,000 or more
Data for Question 25 (3 points)

Plan effective date: 1/1/2003.

Actuarial cost method: Aggregate.

Valuation interest rate: 7% per year.

Normal cost as of 1/1/2003: $200,000.

Normal cost as of 1/1/2004: $260,000.

Selected interest rates for January 2004:

- 175% of Federal mid-term rate: 6.20%
- Current liability interest rate: 6.25%

The minimum required contribution for 2003 was made on 12/31/2003.

Contributions for the 2004 plan year of $53,500 each were made on 4/15/2004 and 7/15/2004. A final contribution required to meet the balance of the minimum funding standard requirements for 2004 was paid on 12/31/2004.

The plan is subject to the quarterly contribution requirements for 2004.

Question 25

In what range is the additional interest charge in the 2004 funding standard account due to late quarterly payments?

(A) Less than $200

(B) $200 but less than $400

(C) $400 but less than $600

(D) $600 but less than $800

(E) $800 or more
Data for Question 26 (4 points)

Plan effective date: 1/1/2001.

Normal retirement benefit: $1,000 per month.

Actuarial cost method:

Before 2004  Entry age normal
After 2003    Frozen initial liability

Valuation interest rate 7% per year.

Data for sole plan participant:

Date of birth 1/1/1951
Date of hire 1/1/1996

Contributions of $5,000 for each of the 2001, 2002, and 2003 plan years were made on 12/31/2001, 12/31/2002, and 12/31/2003 respectively.

There have been no gains or losses in any year.

Selected annuity value:

$$\bar{a}_{65}^{(12)} = 10.00$$

Question 26

In what range is the minimum required contribution for 2004 as of 12/31/2004?

(A) Less than $1,600
(B) $1,600 but less than $1,800
(C) $1,800 but less than $2,000
(D) $2,000 but less than $2,200
(E) $2,200 or more
Data for Question 27 (3 points)

Plan effective date: 1/1/1991.

Actuarial cost method: Individual level premium.

Normal retirement age: 62.

Normal retirement benefit:

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Benefit Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/1991</td>
<td>$20 per month for each year of service</td>
</tr>
<tr>
<td>1/1/2002</td>
<td>$25 per month for each year of service</td>
</tr>
<tr>
<td>1/1/2004</td>
<td>$30 per month for each year of service</td>
</tr>
</tbody>
</table>

Valuation interest rate: 7% per year.

Data for sole participant:

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of birth</td>
<td>1/1/1956</td>
</tr>
<tr>
<td>Date of hire</td>
<td>1/1/1981</td>
</tr>
</tbody>
</table>

Selected annuity value:

\[ \ddot{a}_{62}^{(12)} = 9.873 \]

Question 27

In what range is the 2004 normal cost as of 1/1/2004?

(A) Less than $1,000

(B) $1,000 but less than $1,500

(C) $1,500 but less than $2,000

(D) $2,000 but less than $2,500

(E) $2,500 or more
2004

Data for Question 28 (5 points)

Plan effective date: 1/1/1995.

Actuarial cost method: Aggregate (level percent of compensation).

Selected actuarial assumptions:

Valuation interest rate 8% per year
Compensation increases 4% per year

150% of Federal mid-term rate for January 2004: 5.31%.

Accumulated deficiency in funding standard account as of 12/31/2002: $500,000.

Selected valuation results and funding standard account items as of 1/1/2003:

- Actuarial (market) value of assets $2,000,000
- Present value of future benefits 10,000,000
- Total annual compensation 7,500,000
- Present value of future compensation 50,000,000

There were no experience (gains)/losses during 2003.

As of 1/1/2003 and 1/1/2004 all participants were active and under age 64. There were no new hires, terminations or deaths during 2003.

The employer made no contributions for 2003.

A funding waiver was granted for 2003 in the amount necessary to avoid a funding deficiency for the 2003 plan year.

Question 28

In what range is the minimum required contribution for 2004 as of 12/31/2004?

(A) Less than $1,600,000
(B) $1,600,000 but less than $1,700,000
(C) $1,700,000 but less than $1,800,000
(D) $1,800,000 but less than $1,900,000
(E) $1,900,000 or more
Data for Question 29 (2 points)

Type of plan: Cash balance.

Effective date: 1/1/1995.

Actuarial cost method: Frozen initial liability.

Actuarial value of assets: Smoothed market value of assets.

Consider the following statements:

I. Automatic approval is available to change the actuarial cost method to unit credit.

II. If the actuarial cost method is changed as of 1/1/2003, no change in the actuarial cost method can receive automatic approval until 1/1/2008 under Rev. Proc. 2000-40.

III. The actuarial value of assets must be limited to no more than 120% of the fair market value of assets.

Question 29

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.
2004

Data for Question 30 (4 points)

Plan effective date: 1/1/1990.

Actuarial cost method: Frozen initial liability.

Valuation interest rate: 7% per year.

Actuarial value of assets:

Before 2004  Average of market value and book value, but not less than 80% nor more than 120% of market value
After 2003  Market value

Initial accrued liability: $350,000.

Credit balance in funding standard account as of 12/31/2003: $43,000.

Selected valuation results as of 1/1/2004:

- Present value of future benefits $1,800,000
- Market value of assets 350,000
- Book value of assets 570,000
- Compensation 600,000
- Present value of future compensation 4,000,000

Question 30

In what range is the minimum required contribution for 2004 payable 12/31/2004?

(A)  Less than $177,000
(B)  $177,000 but less than $182,000
(C)  $182,000 but less than $187,000
(D)  $187,000 but less than $192,000
(E)  $192,000 or more
2004

Data for Question 31 (4 points)

Valuation interest rate: 7% per year.

Actuarial value of assets:

Prior to 2002 Fair market value
After 2001 Smoothed market value (with phase-in) as defined in Rev. Proc. 2000-40 (smoothing of difference between expected and actual market value of assets), with a 5-year smoothing period.

Reconciliation of market value of assets:

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market value of assets, as of 1/1</td>
<td>$5,000,000</td>
<td>$4,100,000</td>
</tr>
<tr>
<td>Contributions during the calendar year</td>
<td>200,000</td>
<td>250,000</td>
</tr>
<tr>
<td>Benefit payments during the calendar year</td>
<td>300,000</td>
<td>250,000</td>
</tr>
<tr>
<td>Investment return for the calendar year</td>
<td>(800,000)</td>
<td>500,000</td>
</tr>
</tbody>
</table>

Contributions and benefit payments are made on 7/1 during each plan year.

All administrative expenses are paid directly by the plan sponsor.

Question 31

In what range is the absolute value of the change in the actuarial value of assets from 1/1/2003 to 1/1/2004?

(A) Less than $175,000
(B) $175,000 but less than $325,000
(C) $325,000 but less than $475,000
(D) $475,000 but less than $625,000
(E) $625,000 or more
2004

Data for Question 32 (4 points)

Normal retirement benefit: $30 per month for each year of service.

A plan amendment was adopted on 1/1/2004, per the collective bargaining agreement, which provided for the following:

- $40 per month for each year of service effective 7/1/2004
- $50 per month for each year of service effective 7/1/2005
- $60 per month for each year of service effective 7/1/2006

Actuarial cost method: Unit credit.

Valuation interest rate: 7% per year.

Credit balance in funding standard account as of 12/31/2003: $10,000.

Actuarial (market) value of assets as of 1/1/2004: $150,000.

Net amortization charges in funding standard account as of 1/1/2004: $3,500.

Data for only participants as of 1/1/2004:

<table>
<thead>
<tr>
<th></th>
<th>Smith</th>
<th>Brown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of birth</td>
<td>1/1/1941</td>
<td>1/1/1950</td>
</tr>
<tr>
<td>Date of hire</td>
<td>1/1/1976</td>
<td>1/1/1984</td>
</tr>
</tbody>
</table>

Selected annuity value:

\[ \ddot{a}_{65}^{(12)} = 9.24 \]

The fresh start approach is used in determining the deductible limit. The deductible limit is not affected by the unfunded current liability.

Question 32

In what range is the deductible limit for 2004?

(A) Less than $7,000

(B) $7,000 but less than $11,000

(C) $11,000 but less than $15,000

(D) $15,000 but less than $19,000

(E) $19,000 or more
Data for Question 33 (3 points)

Plan effective date: 1/1/1990.

Actuarial cost method: Unit credit.

Average compensation: Average of the three highest years out of the final five years of employment.

Normal retirement benefit: 2% of average compensation for each year of service.

Early retirement benefit: Normal retirement benefit reduced by 1/15 per year for the first 5 years and 1/30 for the next 5 years prior to age 65.

Selected actuarial assumptions:

- Valuation interest rate: 7% per year
- Compensation increases: 3.5% per year
- Retirement age: 60

Data for participant Smith:

Date of birth: 1/1/1945
Date of hire: 1/1/1979
Date of retirement: 1/1/2004

Compensation history:

<table>
<thead>
<tr>
<th>Year</th>
<th>Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>$100,000</td>
</tr>
<tr>
<td>2002</td>
<td>85,000</td>
</tr>
<tr>
<td>2001</td>
<td>108,000</td>
</tr>
<tr>
<td>2000</td>
<td>74,000</td>
</tr>
<tr>
<td>1999</td>
<td>91,000</td>
</tr>
</tbody>
</table>

Selected annuity values:

\[ \ddot{a}_{69}^{(12)} = 10.85 \quad \ddot{a}_{60}^{(12)} = 10.12 \]

Question 33

In what range is the absolute value of the actuarial (gain)/loss as of 1/1/2004 due solely to Smith’s retirement?

(A) Less than $7,500

(B) $7,500 but less than $15,000

(C) $15,000 but less than $22,500

(D) $22,500 but less than $30,000

(E) $30,000 or more
Normal retirement benefit: 2% of final compensation times years of service.

Preretirement death benefit: $50,000 payable at end of the year of death.

Actuarial cost methods:

<table>
<thead>
<tr>
<th>Retirement benefits</th>
<th>Unit credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death benefits</td>
<td>One-year term cost</td>
</tr>
</tbody>
</table>

Valuation interest rate: 7% per year.

Assumed compensation increases: 3% per year.

Credit balance in funding standard account as of 12/31/2003: $10,000.

Data for all participants as of 1/1/2004:

<table>
<thead>
<tr>
<th></th>
<th>Smith</th>
<th>Jones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of birth</td>
<td>1/1/1941</td>
<td>1/1/1940</td>
</tr>
<tr>
<td>Date of hire</td>
<td>1/1/1990</td>
<td>1/1/1990</td>
</tr>
<tr>
<td>2003 compensation</td>
<td>$50,000</td>
<td>$70,000</td>
</tr>
</tbody>
</table>

Net amortization charge in funding standard account as of 1/1/2004: $30,000.

Selected annuity value and mortality rates:

\[
q_{63} = 0.02 \quad q_{64} = 0.04 \quad \ddot{a}_{65}^{(12)} = 9.24
\]

Only contribution for 2004: $60,000 made on 1/1/2004.

**Question 34**

In what range is the credit balance as of 12/31/2004?

(A) Less than $16,000
(B) $16,000 but less than $17,000
(C) $17,000 but less than $18,000
(D) $18,000 but less than $19,000
(E) $19,000 or more
Data for Question 35 (3 points)

Plan effective date: 1/1/2004.

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

Preretirement death benefit: $35,000 lump sum payment at the end of the year of death.

Actuarial cost method: Unit credit for retirement benefits.
One-year term for preretirement death benefits.

Selected actuarial assumptions:

<table>
<thead>
<tr>
<th>Valuation interest rate</th>
<th>7% per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preretirement decrements other than death</td>
<td>None</td>
</tr>
</tbody>
</table>

\[
\begin{array}{c|c}
 x & \ell_x \\
 50 & 952,223 \\
 51 & 947,695 \\
 65 & 826,026 \\
\end{array}
\]

Data for sole plan participant:

Date of birth 1/1/1954
Date of hire 1/1/1994

Selected annuity value:

\[
\ddot{a}_{65}^{(12)} = 8.73
\]

Question 35

In what range is the minimum required contribution for 2004 as of 12/31/2004?

(A) Less than $3,000

(B) $3,000 but less than $3,200

(C) $3,200 but less than $3,400

(D) $3,400 but less than $3,600

(E) $3,600 or more
Data for Question 36 (5 points)

Plan effective date: 1/1/2003.

Actuarial cost method: Attained age normal.

Valuation interest rate: 7% per year.

Initial accrued liability: $950,000.

The plan was amended effective 1/1/2004, resulting in a 15% increase in the unfunded liability.

Normal cost as of 1/1/2003: $95,000.

A contribution equal to the deductible limit for 2003 was made on 12/31/2003.

Normal cost as of 1/1/2004: $100,000.

A contribution equal to the deductible limit for 2004 was made on 1/1/2004.

There were no experience gains or losses during 2003.

Question 36

In what range is the credit balance in the funding standard account as of 12/31/2004?

(A) Less than $131,000

(B) $131,000 but less than $141,000

(C) $141,000 but less than $151,000

(D) $151,000 but less than $161,000

(E) $161,000 or more
Data for Question 37 (4 points)

Actuarial cost method: Frozen initial liability.

Valuation interest rate: 6.5% per year.

Current liability interest rate: 6.5% per year.

Credit balance in funding standard account as of 12/31/2003: $80,000.

Selected valuation results and other information as of 1/1/2004:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frozen initial liability normal cost</td>
<td>$30,000</td>
</tr>
<tr>
<td>Amortization charge for initial accrued liability</td>
<td>45,000</td>
</tr>
<tr>
<td>Current liability</td>
<td>3,500,000</td>
</tr>
<tr>
<td>Expected increase in current liability for 2004</td>
<td>30,000</td>
</tr>
<tr>
<td>Actuarial value of assets</td>
<td>2,950,000</td>
</tr>
<tr>
<td>Market value of assets</td>
<td>2,900,000</td>
</tr>
<tr>
<td>Outstanding balance of unfunded old liability</td>
<td>100,000</td>
</tr>
</tbody>
</table>

The plan had 300 participants on each day during 2003.

The plan is subject to the additional funding charge in 2004.

The applicable percentage of unfunded new liability is defined by the following formula, where FCL% is the funded current liability percentage:

\[ 30\% - [(FCL\% - 60\%, \text{not less than } 0\%) \times 0.4] \]

The unfunded old liability amortization base has a remaining period of three years as of 1/1/2004.

Question 37

In what range is the additional funding charge for 2004 as of 12/31/2004?

(A) Less than $83,000

(B) $83,000 but less than $103,000

(C) $103,000 but less than $123,000

(D) $123,000 but less than $143,000

(E) $143,000 or more
Data for Question 38 (5 points)

Plan effective date: 1/1/2000.

Actuarial cost method: Unit credit.

Valuation interest rate: 7% per year.

Credit balance in funding standard account as of 12/31/2002: $2,000.

Selected valuation results as of 1/1/2003:

- Market value of assets: $78,000
- Actuarial value of assets: 78,000
- Normal cost: 12,000
- Net amortization charges: 5,000
- Accrued liability: 85,000


Selected valuation results as of 1/1/2004:

- Market value of assets: $76,000
- Actuarial value of assets: 85,000
- Accrued liability: 90,000
- Normal cost: 11,000

The employer did not make any contributions for the 2004 plan year.

Question 38

In what range is the initial excise tax due to the 12/31/2004 accumulated funding deficiency?

(A) Less than $1,150

(B) $1,150 but less than $1,300

(C) $1,300 but less than $1,450

(D) $1,450 but less than $1,600

(E) $1,600 or more
Data for Question 39 (3 points)

Plan effective date: 1/1/1996.

Actuarial cost method: Frozen initial liability.

Valuation interest rate: 7% per year.

150% of Federal mid-term rate: 5.31% per year.

Amortization of initial accrued liability: $65,000.

The employer is unable to make the minimum required contribution for 2004 and requests an extension of amortization for purposes of the minimum funding standard account.

The request for the maximum extension allowable is approved effective 1/1/2004.

Question 39

In what range is the decrease in charges to the funding standard account as of 12/31/2004?

(A) Less than $7,250
(B) $7,250 but less than $8,250
(C) $8,250 but less than $9,250
(D) $9,250 but less than $10,250
(E) $10,250 or more
Data for Question 40 (4 points)

Plan effective date: 1/1/1990.

Selected actuarial assumptions:

- Valuation interest rate: 7% per year
- Current liability interest rate: 6% per year

Credit balance in funding standard account as of 12/31/2003: $100,000.

Selected valuation results as of 1/1/2004:

- Accrued liability: $1,110,000
- Normal cost: $125,000
- Actuarial (market) value of assets: $1,000,000
- Current liability: $1,300,000
- Expected increase in current liability for 2004: $150,000

Net amortization charges in the funding standard account as of 1/1/2004: $50,000.

The plan is subject to the additional funding charge for 2004.

The applicable percentage of unfunded new liability is defined by the following formula, where FCL% is the funded current liability percentage:

\[
30\% - \left[ (FCL\% - 60\%, \text{not less than } 0\%) \times 0.4 \right]
\]

Maximum number of participants during 2003: 200.

Question 40

In what range is the minimum required contribution for 2004 as of 12/31/2004?

(A) Less than $122,000
(B) $122,000 but less than $142,000
(C) $142,000 but less than $162,000
(D) $162,000 but less than $182,000
(E) $182,000 or more
Data for Question 41 (4 points)

Plan effective date: 1/1/2001.

Actuarial cost method: Entry age normal.

Valuation interest rate: 7% per year.

Credit balance in funding standard account as of 12/31/2003: $10,000.

Normal cost as of 1/1/2004: $40,000.

Initial amount of all amortization bases:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial accrued liability</td>
<td>$500,000</td>
</tr>
<tr>
<td>Experience loss during 2001</td>
<td>15,000</td>
</tr>
<tr>
<td>Experience (gain) during 2002</td>
<td>(20,000)</td>
</tr>
<tr>
<td>Experience (gain) during 2003</td>
<td>(25,000)</td>
</tr>
<tr>
<td>Increase in accrued liability due to plan amendment effective 1/1/2003</td>
<td>50,000</td>
</tr>
</tbody>
</table>

Question 41

In what range is the minimum required contribution for 2004 as of 12/31/2004?

(A) Less than $66,000

(B) $66,000 but less than $68,000

(C) $68,000 but less than $70,000

(D) $70,000 but less than $72,000

(E) $72,000 or more
Data for Question 42 (5 points)

Plan effective date: 1/1/1997.

Actuarial cost method:

Before 2004    Frozen initial liability
After 2003     Entry age normal

Valuation interest rate: 7% per year.

Credit balance in funding standard account as of 12/31/2002: $50,000.

Selected valuation results and funding standard account entries as of 1/1/2003:

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal cost</td>
<td>$460,000</td>
</tr>
<tr>
<td>Amortization charge</td>
<td>280,000</td>
</tr>
</tbody>
</table>

A contribution of $900,000 was made on 12/31/2003.

Selected valuation results as of 1/1/2004:

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accrued liability</td>
<td>$4,750,000</td>
</tr>
<tr>
<td>Normal cost</td>
<td>520,000</td>
</tr>
<tr>
<td>Actuarial value of assets</td>
<td>1,750,000</td>
</tr>
</tbody>
</table>

Question 42

In what range is the deductible limit for 2004?

(A) Less than $1,000,000

(B) $1,000,000 but less than $1,025,000

(C) $1,025,000 but less than $1,050,000

(D) $1,050,000 but less than $1,075,000

(E) $1,075,000 or more
2004

Data for Question 43 (3 points)

Plan effective date: 1/1/2000.

Valuation interest rate: 7% per year.

The plan was granted a funding waiver for the 2001 plan year in the amount of $1,000,000.

Additional funding charge as of 12/31/2002: $20,000.

Additional interest charge due to late quarterly contributions for 2002 as of 12/31/2002: $25,000.

Additional interest charge due to late quarterly contributions for 2003 as of 12/31/2003: $27,000.

There have been no other waivers, additional funding charges or additional interest charges.

Selected interest rates for January:

<table>
<thead>
<tr>
<th></th>
<th>150% of Federal mid-term rate</th>
<th>Current liability rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>8.47%</td>
<td>6.00%</td>
</tr>
<tr>
<td>2002</td>
<td>6.77%</td>
<td>6.00%</td>
</tr>
<tr>
<td>2003</td>
<td>5.17%</td>
<td>6.00%</td>
</tr>
</tbody>
</table>

Question 43

In what range is the reconciliation account balance as of 1/1/2004?

(A) Less than $65,000

(B) $65,000 but less than $70,000

(C) $70,000 but less than $75,000

(D) $75,000 but less than $80,000

(E) $80,000 or more
Data for Question 44 (3 points)

Plan effective date: 1/1/1997.

Plan year: 1/1 – 12/31.

Tax year: 10/1 – 9/30.

Actuarial cost method: Frozen initial liability.

Valuation interest rate: 7% per year.

Initial unfunded accrued liability: $4,000,000.

Normal cost for 2003 as of 1/1/2003: $1,350,000.

Normal cost for 2004 as of 1/1/2004: $1,400,000.

The deductible limit for any tax year is based on the plan year beginning in that tax year.

Question 44

In what range is the deductible limit for the tax year ending 9/30/2004?

(A) Less than $2,010,000

(B) $2,010,000 but less than $2,030,000

(C) $2,030,000 but less than $2,050,000

(D) $2,050,000 but less than $2,070,000

(E) $2,070,000 or more
**2004**

**Data for Question 45 (2 points)**

Actuarial cost method: Aggregate.

Valuation interest rate: 7% per year.

Actuarial (market) value of assets as of 1/1/2003: $450,000.


Benefit payments made on 1/1/2003: $20,000.

Credit balance in funding standard account as of 12/31/2003: $0.

Selected valuation results as of 1/1/2004:

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<th>Description</th>
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<td>Actuarial (market) value of assets</td>
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<td>Compensation for 2004</td>
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<td>Present value of future compensation</td>
<td>9,600,000</td>
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**Question 45**

In what range is the increase in the normal cost as of 1/1/2004 due to the investment loss?

(A) Less than $2,600

(B) $2,600 but less than $3,600

(C) $3,600 but less than $4,600

(D) $4,600 but less than $5,600

(E) $5,600 or more
### Course EA-2A, Fall 2004

**ANSWER KEY**

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