SOCIETY OF ACTUARIES

AMERICAN SOCIETY OF PENSION ACTUARIES

JOINT BOARD FOR THE ENROLLMENT OF ACTUARIES

ENROLLED ACTUARIES PENSION EXAMINATION, SEGMENT A

NOVEMBER 2004 EA-2, SEGMENT A, EXAMINATION

E2A-10-04 **Printed in U.S.A.**

2004

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:

Plan Year	Gateway %
2004	85%
2003	92%
2002	89%
2001	95%

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

2004

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

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

<u>Data for Question 5</u> (3 points)

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

Early retirement benefit: None.

Plan vesting schedule:

Years of service	Percent vested
Less than 3	0%
3	20%
4	40%
5	60%
6	80%
7 or more	100%

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:

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

<u>Question 5</u>

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

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:

	$\ddot{a}_{65}^{(12)}$
7%	9.75
5%	11.50

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

<u>Data for Question 9</u> (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:

Outstanding amortization base for initial unfunded liability	$2,850,000
Present value of projected benefits	9,750,000
Present value of future compensation	22,675,000
2004 compensation	2,000,000
Actuarial value of assets	2,850,000

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.

<u>Question 9</u>

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

<u>Data for Question 10</u> (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.

Contribution for 2004: $90,000 paid on 6/30/2004.

<u>Question 10</u>

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:

	1/1/2003	1/1/2004
Accrued liability	\$120,000	\$125,000
Normal cost	10,000	12,000
Actuarial (market) value of assets	120,000	110,000
Benefits paid (mid-year)	20,000	20,000

Contribution for 2003 plan year: \$50,000 paid 12/31/2003.

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:

Valuation interest rate	7% per year
Compensation increases	3.5% per year

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:

$\ddot{a}_{65}^{(12)} = 12.41$

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

2004

<u>Data for Question 13</u> (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:

Name	Date of birth	Date of hire
Smith	1/1/1944	1/1/1974
Jones	1/1/1959	1/1/1989

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:

$$\ddot{a}_{60}^{(12)} = 10.38$$
$$\ddot{a}_{65}^{(12)} = 9.24$$

<u>Question 13</u>

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

<u>Data for Question 14</u> (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:

	Smith	Jones
Compensation for 2003	$25,000	$150,000
Age	25	51
Years of service	2	5

Selected annuity value:

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

<u>Question 14</u>

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

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:

	2003	2004
Normal cost as of 1/1	$70,000	$105,000
Net amortization charges as of 1/1	150,000	360,000
Additional funding charge as of 12/31	80,000	0
Full funding credit as of 12/31	0	100,000
Late interest charges as of 12/31	20,000	

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:

Normal cost	$110,000
Net amortization charges in funding standard account	20,000
Actuarial (market) value of assets	1,100,000
Current liability	1,375,000
Expected increase in current liability for 2003	114,000
Current liability at maximum interest rate	1,325,000

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

30% - [(FCL% - 60%, not less than 0%) x 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

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)

Plan effective date: 1/1/1994.

Actuarial cost method: Frozen initial liability.

Valuation interest rate:

Before 2004	6% per year
After 2003	7% per year

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

Selected valuation results as of 1/1/2004:

	6%	7%
Normal cost	$80,000	$60,000
Unfunded liability	240,000	160,000

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:

	1/1/2003	1/1/2004
Normal cost	$45,000	$35,000
Accrued liability	350,000	370,000

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

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:

Normal cost	$55,000
Unfunded actuarial liability	275,000
Actuarial value of assets	200,000
Market value of assets	185,000
Entry age normal cost	59,000
Entry age normal accrued liability	288,000

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

<u>Data for Question 21</u> (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.

<u>Question 21</u>

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

Data for Question 22 (3 points)

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:

Valuation interest rate	7% per year
Retirement age	65

Data for sole participant as of 1/1/2004:

Date of birth	1/1/1941
Date of hire	1/1/1974
Date of retirement	12/31/2003

Selected annuity values:

$\ddot{a}_{63}^{(12)} = 9.72$ $\quad \ddot{a}_{64}^{(12)} = 9.48$ $\quad \ddot{a}_{65}^{(12)} = 9.24$

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:

Normal cost	$27,000
Current liability	450,000
Expected increase in current liability for the year	25,000
Amortization charges	3,500
Amortization credits	(11,000)
Actuarial value of assets	350,000
Market value of assets	360,000

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%, not less than 0%) x 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

Data for Question 24 (4 points)

Plan effective date: 1/1/1994.

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:

Normal cost	$75,000
Accrued liability	1,000,000
Actuarial (market) value of assets	800,000
Current liability	720,000

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

<u>Data for Question 25</u> (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.

<u>Question 25</u>

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:

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

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

2004

<u>Data for Question 27</u> (3 points)

Plan effective date: 1/1/1991.

Actuarial cost method: Individual level premium.

Normal retirement age: 62.

Normal retirement benefit:

Effective 1/1/1991	\$20 per month for each year of service
Effective 1/1/2002	\$25 per month for each year of service
Effective 1/1/2004	\$30 per month for each year of service

Valuation interest rate: 7% per year.

Data for sole participant:

Date of birth	1/1/1956
Date of hire	1/1/1981

Selected annuity value:

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

<u>Question 27</u>

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

<u>Data for Question 28</u> (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.

<u>Question 28</u>

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

<u>Data for Question 29</u> (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.

<u>Question 29</u>

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

(A) I and II only

(B) I and III only

(C) II and III only

(D) I, II, and III

(E) The correct answer is not given by (A), (B), (C), or (D) above.

Data for Question 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

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:

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

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

<u>Data for Question 32</u> (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:

	Smith	Brown
Date of birth	1/1/1941	1/1/1950
Date of hire	1/1/1976	1/1/1984

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.

<u>Question 32</u>

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:

2003	$100,000
2002	85,000
2001	108,000
2000	74,000
1999	91,000

Selected annuity values:

$\ddot{a}_{59}^{(12)} = 10.85$ $\qquad$ $\ddot{a}_{60}^{(12)} = 10.12$

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

2004

Data for Question 34 (5 points)

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:

Retirement benefits	Unit credit
Death benefits	One-year term cost

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:

	Smith	Jones
Date of birth	1/1/1941	1/1/1940
Date of hire	1/1/1990	1/1/1990
2003 compensation	\$50,000	\$70,000

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

Selected annuity value and mortality rates:

$q_{63} = 0.02 \qquad q_{64} = 0.04 \qquad \ddot{a}_{65}^{(12)} = 9.24$

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

<u>Data for Question 35</u> (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:

Valuation interest rate	7% per year
Preretirement decrements other than death	None

x	ℓ_x
50	952,223
51	947,695
65	826,026

Data for sole plan participant:

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

Selected annuity value:

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

<u>Question 35</u>

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

<u>Data for Question 36</u> (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.

<u>Question 36</u>

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:

Frozen initial liability normal cost	$30,000
Amortization charge for initial accrued liability	45,000
Current liability	3,500,000
Expected increase in current liability for 2004	30,000
Actuarial value of assets	2,950,000
Market value of assets	2,900,000
Outstanding balance of unfunded old liability	100,000

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%, not less than 0%) x 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

Contribution for 2003: $19,000 paid on 7/1/2004.

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

<u>Data for Question 40</u> (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% - [(FCL% - 60%, not less than 0%) x 0.4]

Maximum number of participants during 2003: 200.

<u>Question 40</u>

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:

Initial accrued liability	$500,000
Experience loss during 2001	15,000
Experience (gain) during 2002	(20,000)
Experience (gain) during 2003	(25,000)
Increase in accrued liability due to plan amendment effective 1/1/2003	50,000

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

2004

<u>Data for Question 42</u> (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:

Normal cost	$460,000
Amortization charge	280,000

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

Selected valuation results as of 1/1/2004:

Accrued liability	$4,750,000
Normal cost	520,000
Actuarial value of assets	1,750,000

<u>Question 42</u>

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

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:

	150% of Federal mid-term rate	Current liability rate
2001	8.47%	6.00%
2002	6.77%	6.00%
2003	5.17%	6.00%

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

<u>Data for Question 45</u> (2 points)

Actuarial cost method: Aggregate.

Valuation interest rate: 7% per year.

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

Contribution for 2003: $80,000 paid on 12/31/2003.

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:

Actuarial (market) value of assets	$520,000
Compensation for 2004	1,200,000
Present value of future compensation	9,600,000

<u>Question 45</u>

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

Question #	*Answer*	*# of Points*
1	**A**	**1**
2	**A**	**1**
3	**B**	**1**
4	**A**	**3**
5	**B**	**3**
6	**E**	**4**
7	**D**	**3**
8	**D**	**5**
9	**B**	**4**
10	**B**	**4**
11	**D**	**3**
12	**A**	**3**
13	**C**	**5**
14	**D**	**4**
15	**D**	**3**
16	**C**	**5**
17	**C**	**4**
18	**E**	**3**
19	**B**	**4**
20	**C**	**3**
21	**D**	**5**
22	**B**	**3**
23	**E**	**4**

Question #	*Answer*	*# of Points*
24	**C**	**4**
25	**A**	**3**
26	**C**	**4**
27	**E**	**3**
28	**C**	**5**
29	**E**	**2**
30	**B**	**4**
31	**B**	**4**
32	**D**	**4**
33	**C**	**3**
34	**D**	**5**
35	**C**	**3**
36	**C**	**5**
37	**C**	**4**
38	**D**	**5**
39	**C**	**3**
40	**D**	**4**
41	**C**	**4**
42	**D**	**5**
43	**D**	**3**
44	**C**	**3**
45	**A**	**2**