SOCIETY OF ACTUARIES

AMERICAN SOCIETY OF PENSION ACTUARIES

JOINT BOARD FOR THE ENROLLMENT OF ACTUARIES

ENROLLED ACTUARIES PENSION EXAMINATION, SEGMENT A

NOVEMBER 2010 EA-2, SEGMENT A, EXAMINATION

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LIMITS AND TABLES

(Included with the 2010 EA-2 (Segment A) examination)

Maximum Benefit Limit
IRC section 415(b)

Year	Limit at SSRA
1983-1987	90,000
1988	94,023
1989	98,064
1990	102,582
1991	108,963
1992	112,221
1993	115,641
1994	118,800
1995-1996	120,000
1997	125,000
1998-1999	130,000
2000	135,000
2001	140,000

Year	Limit at 65
2002-2003	160,000
2004	165,000
2005	170,000
2006	175,000
2007	180,000
2008	185,000
2009-2010	195,000

Compensation Limit
IRC section 401(a)(17)

Year	Limit
1989	200,000
1990	209,200
1991	222,220
1992	228,860
1993	235,840
1994-1996	150,000
1997-1999	160,000
2000-2001	170,000
2002-2003	200,000
2004	205,000
2005	210,000
2006	220,000
2007	225,000
2008	230,000
2009-2010	245,000

Highly Compensated Employee Compensation
IRC section 414(q)

Year	Limit
1997-1999	80,000
2000-2001	85,000
2002-2004	90,000
2005	95,000
2006	100,000
2007	100,000
2008	105,000
2009-2010	110,000

Key Employee Compensation
IRC section 416

Year	Officer	1% owner
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
2009-2010	160,000	150,000

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2010

Data for Question 1 (1 point)

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

Neither increase is precluded by IRC section 436.

Consider the following statement:

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

Question 1

Is this statement true or false?

(A) True

(B) False

2010

Data for Question 2 (1 point)

Consider the following statement:

> A multiemployer plan's funding status is considered to be "seriously endangered" if either of the following measures is true:
>
> (a) The plan is less than 80% funded for the plan year.
>
> (b) The plan has an accumulated funding deficiency for the current year, or is projected to have a funding deficiency within 7 years.

Question 2

Is the above statement true or false?

(A) True

(B) False

<u>Data for Question 3</u> (1 point)

Consider the following statement concerning a plan merger:

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

<u>Question 3</u>

Is the above statement true or false?

(A) True

(B) False

2010

<u>Data for Question 4</u> (1 point)

Consider the following statement:

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

<u>Question 4</u>

Is the above statement true or false?

(A) True

(B) False

Data for Question 5 (1 point)

Consider the following statement:

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

Question 5

Is the above statement true or false?

(A) True

(B) False

<u>Data for Question 6</u> (1 point)

Consider the following statement:

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

<u>Question 6</u>

Is the above statement true or false?

(A) True

(B) False

Data for Question 7 (2 points)

Funding standard carryover and prefunding balances:

	1/1/2010	1/1/2011
Funding standard carryover balance	$5,500,000	$5,610,000
Prefunding balance	$5,000,000	$5,100,000

Selected valuation results:

	1/1/2010	1/1/2011
Funding target	$100,000,000	$120,000,000
Actuarial (market) value of assets	$90,000,000	$100,000,000

Consider the following statement:

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

Question 7

Is the above statement true or false?

(A) True

(B) False

Data for Question 8 (3 points)

The 1/1/2010 AFTAP is 85%.

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

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

Selected valuation results as of 1/1/2011:

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

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

Optional forms of payment include:

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

Consider the following statement:

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

Question 8

Is the above statement true or false?

(A) True

(B) False

Data for Question 9 (2 points)

Plan effective date: 1/1/2011.

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

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

No benefit service is credited before the plan effective date.

Data for plan participant Smith:

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

The plan is top heavy for the 2011 plan year.

X = Smith's annual accrued benefit as of December 31, 2011.

Question 9

In what range is ***X***?

(A) Less than \$550

(B) \$550 but less than \$750

(C) \$750 but less than \$950

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

(E) \$1,150 or more

Data for Question 10 (3 points)

Selected data for participant Smith:

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

Plan's actuarial equivalence interest rate: 7.5%.

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

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

Single life annuity factors at selected ages and interest rates:

	5.0%	7.5%
65	12.00	9.85
68	11.06	9.22

Question 10

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

(A) Less than $116,000

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

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

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

(E) $131,000 or more

Data for Question 11 (4 points)

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

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

There is a pre-retirement mortality assumption.

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

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

Selected valuation results:

	1/1/2010	1/1/2011
Actuarial (market) value of assets	$66,000	$65,000
Funding target	$66,000	
Target normal cost	$4,000	
Effective interest rate		6.50%
Shortfall amortization factor		5.9982

Data for all plan participants:

	Smith	Jones
Date of birth	1/1/1970	1/1/1960
Date of hire	1/1/2000	1/1/1985

Selected commutation functions for 1/1/2011:

	Segment rate 1		Segment rate 2		Segment rate 3	
Age	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$
41	13,345	-	9,047	-	6,156	-
51	8,097	-	4,993	-	3,093	-
65	-	44,828	-	22,369	-	11,276
71	-	25,396	-	12,145	-	5,863

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

Question 11

In what range is X?

(A) Less than $1,900

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

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

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

(E) $2,500 or more

Data for Question 12 (4 points)

The plan is amended effective 1/1/2011.

Normal retirement benefit:

Before 2011	2.0% of final year compensation for each year of service
After 2010	4.0% of final year compensation for each year of service

Valuation date: 1/1/2011.

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

Salary increase: 3.0%.

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

Actuarial value of assets: $50,000.

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

Date of birth	1/1/1972
Date of hire	1/1/2002
Expected date of retirement	1/1/2037
2010 compensation	$100,000

Selected annuity factors at the indicated interest rates:

	5.0%	6.0%	7.0%
$\ddot{a}_{65}^{(12)}$	11.665	10.770	9.989

Question 12

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

(A) Less than $60,000

(B) $60,000 but less than $100,000

(C) $100,000 but less than $140,000

(D) $140,000 but less than $180,000

(E) $180,000 or more

Data for Question 13 (2 points)

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

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

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

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

Question 13

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

(A) I and II only

(B) I and III only

(C) II and III only

(D) I, II, and III

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

Data for Question 14 (3 points)

Normal retirement age: 62.

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

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

Data for plan participant Smith:

Date of birth	1/1/1950
Date of hire	1/1/2001
Date of participation	1/1/2002
Date of retirement	12/31/2010

Year	Compensation
2007	$100,000
2008	$125,000
2009	$300,000
2010	$167,000

Selected commutation functions using applicable mortality rate and 5.0% interest:

Age	$N_x^{(12)}$
61	618,223
62	571,733

Question 14

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

(A) Less than $162,000

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

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

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

(E) $177,000 or more

Data for Question 15 (4 points)

Type of plan: Multiemployer.

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

Actuarial cost method: Entry age normal.

Valuation date: 1/1/2011.

Valuation interest rate: 6.0%.

Salary increase: 3.0%.

Selected annuity factor at 6.0%:

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

Selected data for participant Smith:

Date of birth	1/1/1952
Date of hire	1/1/2002
Date of termination	12/31/2010
2010 compensation	$100,000

Question 15

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

(A) Less than $20,000

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

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

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

(E) $65,000 or more

Data for Question 16 (4 points)

Plan effective date: 7/1/2001.

Plan year: 7/1 - 6/30.

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

Valuation date: 7/1/2011.

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

Pre-retirement mortality: None.

Data for sole plan participant Smith:

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

Plan year end	Compensation	Plan year end	Compensation
6/30/2006	\$230,000	6/30/2009	\$210,000
6/30/2007	\$215,000	6/30/2010	\$250,000
6/30/2008	\$230,000	6/30/2011	\$200,000

Selected commutation functions:

	Segment rate 1		Segment rate 2		Segment rate 3	
Age	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$
50	85,511	1,401,273	53,234	781,250	42,073	586,334
60	51,213	713,162	28,999	368,975	21,866	266,552
65	38,821	482,841	20,965	240,861	15,440	170,799
70	28,602	309,979	14,731	149,149	10,597	103,844

Question 16

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

(A) Less than \$575,000

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

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

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

(E) \$635,000 or more

Data for Question 17 (2 points)

Average compensation: Highest average 36 consecutive months of compensation.

Data for participant Smith:

Date of retirement 11/1/2010

Monthly compensation paid each month during indicated calendar year:

2007	$17,500
2008	$19,000
2009	$21,000
2010	$22,500

Question 17

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

(A) Less than $19,000

(B) $19,000 but less than $19,500

(C) $19,500 but less than $20,000

(D) $20,000 but less than $20,500

(E) $20,500 or more

Data for Question 18 (3 points)

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

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

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

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

Selected valuation results as of 1/1/2011:

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

Question 18

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

(A) Less than $1,400,000

(B) $1,400,000 but less than $1,500,000

(C) $1,500,000 but less than $1,600,000

(D) $1,600,000 but less than $1,700,000

(E) $1,700,000 or more

Data for Question 19 (4 points)

Effective date: 1/1/2004.

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

Plan actuarial equivalence assumptions:

Interest rate	4.5%
Mortality	Applicable mortality table

Data for plan participant Smith:

Date of birth	1/1/1946	High consecutive 3-year average compensation	$235,000
Date of hire	1/1/1991	Form of payment elected	Lump sum
Date of retirement	1/1/2011		

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

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

	Segment rate 1		Segment rate 2		Segment rate 3	
Age	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$
65	38,856	466,449	20,984	231,910	11,398	116,537
70	28,646	298,073	14,754	142,952	7,646	69,245
85	7,617	40,156	3,403	17,266	1,532	7,491

	4.50% interest		5.50% interest	
Age	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$
65	52,992	664,276	28,534	328,451
70	40,010	432,084	20,542	206,160
85	11,429	61,450	5,087	26,301

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

Question 19

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

(A) Less than $1,450,000

(B) $1,450,000 but less than $1,550,000

(C) $1,550,000 but less than $1,650,000

(D) $1,650,000 but less than $1,750,000

(E) $1,750,000 or more

Data for Question 20 (4 points)

Plan effective date: 1/1/2000.

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

Prefunding balances:

	1/1/2010	1/1/2011
Prefunding balance	$500,000	$600,000
Balance applied?	Yes	Yes

Selected valuation results:

	1/1/2010	1/1/2011
Actuarial (market) value of assets	$15,000,000	$17,000,000
Funding target	$15,500,000	$16,750,000
Target normal cost	$750,000	$900,000

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

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

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

Question 20

In what range is ***X***?

(A) Less than $330,000

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

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

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

(E) $375,000 or more

<u>Data for Question 21</u> (2 points)

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

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

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

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

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

Define the following items:

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

<u>Question 21</u>

Which of the following statement is true?

(A) TNC-**A** > TNC-**B** > TNC-**C**

(B) TNC-**A** > TNC-**C** > TNC-**B**

(C) TNC-**C** > TNC-**A** > TNC-**B**

(D) TNC-**C** > TNC-**B** > TNC-**A**

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

Data for Question 22 (3 points)

Effective date: 1/1/2009.

For 2011, the plan is not at-risk.

Selected valuation results as of 1/1/2011:

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

Question 22

In what range is the deduction limit for 2011?

(A) Less than \$310,000

(B) \$310,000 but less than \$360,000

(C) \$360,000 but less than \$410,000

(D) \$410,000 but less than \$460,000

(E) \$460,000 or more

Data for Question 23 (5 points)

Plan effective date: 1/1/2000.

The plan has a lump sum option.

Prefunding balance as of 1/1/2010: $187,500.

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

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

Selected valuation results:

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

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

Question 23

In what range is ***X***?

(A) Less than $521,000

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

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

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

(E) $581,000 or more

Data for Question 24 (4 points)

Type of plan: Multiemployer.

Valuation interest rate: 7.0%.

Benefits are payable annually at the beginning of the year.

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

	Smith	Jones
Current age	65	65
Retirement age	65	65
Annual benefit	\$1,000	\$1,000
Benefit form	Life with 10-year certain	Life with 10-year certain

Selected commutation functions and mortality rates:

Age	D_x	N_x	q_x
65	10,000	102,245	0.010
75	4,322	33,380	0.027

Smith dies during 2011.

Question 24

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

(A) Less than \$3,550

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

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

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

(E) \$14,200 or more

Data for Question 25 (2 points)

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

ASSERTION

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

REASON

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

Question 25

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

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

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

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

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

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

Data for Question 26 (3 points)

Plan effective date: 1/1/1995.

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

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

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

Selected information for participant Smith:

Date of birth	1/1/1966
Date of hire	1/1/1996
Date of termination	1/1/2011

Selected commutation functions:

	Segment rate 1		Segment rate 2		Segment rate 3	
Age	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$
45	109,730	1,848,847	71,627	1,067,634	46,943	625,535
65	38,821	465,050	20,965	231,251	11,387	116,222
70	28,602	296,871	14,731	142,396	7,635	68,985
85	7,564	39,772	3,379	17,102	1,521	7,420

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

Question 26

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

(A) Less than $46,000

(B) $46,000 but less than $50,500

(C) $50,500 but less than $55,000

(D) $55,000 but less than $59,500

(E) $59,500 or more

Data for Question 27 (4 points)

Type of plan: Multiemployer.

Plan effective date: 1/1/1983.

Actuarial cost method: Frozen initial liability.

Valuation interest rate: 7.0%.

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

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

Selected valuation results as of 1/1/2011:

Present value future benefits	$35,000,000
Actuarial (market) value of assets	$30,000,000
Present value of future compensation	$80,000,000
Total compensation	$8,000,000

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

Question 27

In what range is ***X***?

(A) Less than $450,000

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

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

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

(E) $510,000 or more

Data for Question 28 (4 points)

Plan effective date: 1/1/2005.

Selected interest rates for all years:

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

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

Asset valuation method:

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

Selected valuation results:

	1/1/2009	1/1/2010	1/1/2011
Funding target		$2,000,000	$2,100,000
Target normal cost			$100,000
Market value of assets	$2,100,000	$2,200,000	$1,900,000

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

7-year shortfall amortization factor: 5.9982.

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

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

Question 28

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

(A) Less than $20,000

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

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

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

(E) $35,000 or more

Data for Question 29 (2 points)

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

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

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

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

Question 29

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

(A) None

(B) I only

(C) II only

(D) III only

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

Data for Question 30 (3 points)

Participant data as of 12/31/2010:

	Present Value of Accrued Benefits	2010 Compensation	Ownership Percentage
Employee 1	$450,000	$220,000	98%
Employee 2	$400,000	$140,000	0%
Employee 3	$200,000	$180,000	2%
Employee 4	$100,000	$200,000	0%
25 others	$400,000	$800,000	0%

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

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

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

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

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

Question 30

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

(A) Less than 0.43

(B) 0.43 but less than 0.50

(C) 0.50 but less than 0.57

(D) 0.57 but less than 0.64

(E) 0.64 or more

Data for Question 31 (4 points)

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

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

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

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

Selected valuation results as of 1/1/2011:

Actuarial (market) value of assets	$5,500,000
Funding target	$5,200,000
Target normal cost (excluding plan-related expenses)	$350,000
7-year shortfall amortization factor	5.9982

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

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

Question 31

In what range is ***X***?

(A) Less than $20,000

(B) $20,000 but less than $40,000

(C) $40,000 but less than $60,000

(D) $60,000 but less than $80,000

(E) $80,000 or more

Data for Question 32 (5 points)

Selected plan provisions:

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

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

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

There is a pre-retirement mortality assumption.

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

Date of birth	1/1/1956
Annual accrued benefit	$10,000
Marital status	Single

Selected commutation functions:

	Segment rate 1		Segment rate 2		Segment rate 3	
Age	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$
55	66,478	984,873	39,470	526,954	23,550	285,466
56	63,164	919,914	37,148	488,548	21,957	262,646
60	51,243	691,251	29,016	356,431	16,518	185,907
61	48,568	641,235	27,242	328,228	15,363	169,918
65	38,856	466,449	20,984	231,910	11,398	116,537
75	20,282	176,044	9,963	81,453	4,926	38,046
76	18,789	156,446	9,142	71,867	4,478	33,325

Question 32

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

(A) Less than $33,000

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

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

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

(E) $39,000 or more

Data for Question 33 (2 points)

Valuation date: 1/1/2011.

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

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

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

Neither plan is in at-risk status.

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

ASSERTION	REASON
The 2011 deduction limit for Plan A is larger than the 2011 deduction limit for Plan B.	For Plan B, the impact of future salary increases is not reflected in the cushion amount.

Question 33

Which of the following statements is true?

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

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

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

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

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

<u>Data for Question 34</u> (3 points)

Plan effective date: 1/1/2011.

Selected valuation results:

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

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

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

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

<u>Question 34</u>

In what range is the target normal cost for 2015?

(A) Less than $34,000

(B) $34,000 but less than $36,000

(C) $36,000 but less than $38,000

(D) $38,000 but less than $40,000

(E) $40,000 or more

Data for Question 35 (4 points)

Type of plan: Multiemployer.

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

Early retirement eligibility: Age 55.

Early retirement benefit: Unreduced accrued benefit.

Valuation date: 1/1/2011.

Actuarial cost method: Unit credit.

Valuation interest rate: 7.5%.

Pre-retirement mortality: None.

Data for participant Smith:

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

The actuary changes the retirement and mortality assumptions.

Retirement rates and selected annuity factors:

	Old assumptions		New assumptions	
X	$q_x^{(\text{ret})}$	$\ddot{a}_x^{(12)}$	$q_x^{(\text{ret})}$	$\ddot{a}_x^{(12)}$
55	10%	11.10	--	11.68
62	25%	9.86	30%	10.59
65	100%	9.25	100%	10.05

Question 35

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

(A) Less than $700

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

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

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

(E) $1,900 or more

Data for Question 36 (4 points)

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

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

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

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

Minimum required contribution for 2010: $100,000.

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

There were no required quarterly installments due for 2010.

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

Minimum required contribution for 2011: $125,000.

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

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

Question 36

In what range is $\boldsymbol{X} + \boldsymbol{Y}$?

(A) Less than $30,000

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

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

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

(E) $45,000 or more

Data for Question 37 (2 points)

Plan effective date: 1/1/2000.

Selected valuation results as of 1/1/2010:

Funding target	\$10,000
Actuarial (market) value of plan assets	\$9,700
Funding standard carryover balance	\$0
Prefunding balance	\$200

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

Consider the following statement:

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

Question 37

Is the above statement true or false?

(A) True

(B) False

Data for Question 38 (3 points)

Effective interest rate: 5.0%.

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

Selected valuation results as of 1/1/2011:

	Not at-risk assumptions	At-risk assumptions for section 404(o) purposes
Funding target	$220,000	$235,000
Funding target, including effects of future compensation increases	$280,000	
Target normal cost	$15,000	$17,000

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

Question 38

In what range is the deduction limit for 2011?

(A) Less than $164,000

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

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

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

(E) $197,000 or more

Data for Question 39 (5 points)

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

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

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

Valuation assumptions:

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

Data for participant Smith:

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

Selected commutation functions:

	Segment rate 1		Segment rate 2		Segment rate 3	
Age	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$
60	4,990	65,080	2,830	33,650	1,610	17,600
62	4,460	55,610	2,480	28,330	1,390	14,600
65	3,750	43,270	2,030	21,570	1,100	10,870
80	1,190	7,920	560	3,530	260	1,590

Question 39

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

(A) Less than $340,000

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

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

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

(E) $415,000 or more

<u>Data for Question 40</u> (4 points)

Effective date: 1/1/2009.

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

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

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

2009 waiver amortization factor: 4.6228.

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

7-year shortfall amortization factor for 2010: 5.9253.

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

Selected valuation results as of 1/1/2011:

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

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

<u>Question 40</u>

In what range is the **<u>minimum required contribution</u>** for 2011?

(A) Less than $36,000

(B) $36,000 but less than $36,900

(C) $36,900 but less than $37,800

(D) $37,800 but less than $38,700

(E) $38,700 or more

Data for Question 41 (4 points)

Valuation date: 1/1/2011.

The plan does not offer any accelerated benefit distributions.

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

Funding standard carryover and prefunding balances:

	1/1/2010	1/1/2011
Funding standard carryover balance	$480,000	
Prefunding balance	$62,500	$50,000

Selected valuation results:

	1/1/2010	1/1/2011
Funding target		$6,920,000
Actuarial (market) value of assets		$5,600,000
Effective interest rate	6.06%	

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

Date established	Original shortfall amortization base
1/1/2009	$1,330,000
1/1/2010	$200,000

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

Shortfall amortization factors for all years:

5-year	4.5459
6-year	5.2932
7-year	5.9982

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

Question 41

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

(A) Less than $350,000

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

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

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

(E) $362,000 or more

Data for Question 42 (2 points)

The plan does not offer any accelerated benefit options

	1/1/2010	1/1/2011
Funding standard carryover balance	\$100,000	\$100,000
Prefunding balance	\$150,000	\$300,000

Selected valuation results:

	1/1/2010	1/1/2011
Actuarial (market) value of assets	\$1,000,000	\$1,250,000
Funding target	\$1,000,000	\$1,250,000

Consider the following statements for the 2011 plan year:

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

II. The plan is subject to quarterly contribution requirements.

III. The plan's funding shortfall is \$0.

Question 42

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

(A) I and II only

(B) I and III only

(C) II and III only

(D) I, II, and III

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

Data for Question 43 (3 points)

Data for participant Smith:

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

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

Plan actuarial equivalence for lump sum distributions:

Interest basis	Applicable interest rate using 3-month lookback
Pre-retirement mortality	None

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

Applicable segment rates in effect:

October 2010 (before phase-in)	{5.0%, 6.0%, 7.0%}
December 2010 (before phase-in)	{5.5%, 6.5%, 7.5%}

Selected annuity values:

Interest rate	$\ddot{a}_{65}^{(12)}$	Interest rate	$\ddot{a}_{65}^{(12)}$
4.0%	12.79	6.1%	10.78
5.0%	11.79	6.4%	10.53
5.5%	11.32	6.5%	10.44
5.8%	11.05	6.8%	10.19
6.0%	10.87	7.0%	10.02

Question 43

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

(A) Less than $85,000

(B) $85,000 but less than $95,000

(C) $95,000 but less than $105,000

(D) $105,000 but less than $115,000

(E) $115,000 or more

Data for Question 44 (4 points)

Type of plan: Multiemployer.

Plan provisions:

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

Actuarial cost method: Entry age normal.

Valuation interest rate: 7.0%.

Data for plan participant Smith:

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

Probability of retirement:

Age 62	50%
Age 65	100%

Selected commutation functions:

Age	D_x	$N_x^{(12)}$
62	14,268	154,707
65	11,387	116,222

Question 44

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

(A) Less than \$150,000

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

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

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

(E) \$165,000 or more

Data for Question 45 (4 points)

Valuation date: 1/1/2011.

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

Data for participant Smith:

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

Selected commutation functions:

	Segment rate 1		Segment rate 2		Segment rate 3		Effective interest rate	
Age	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$	D_x	$N_x^{(12)}$
67	34,491	391,596	18,277	191,930	9,743	95,048	13,334	134,894
75	20,229	175,082	9,936	81,019	4,913	37,847	6,981	55,310
77	17,293	137,466	8,335	62,702	4,045	28,867	5,801	42,495
87	5,678	26,482	2,489	11,214	1,100	4,792	1,653	7,322

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

	Segment rates	Effective interest rate
8-year	6.53	6.31
10-year	7.69	7.42

Question 45

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

(A) Less than \$127,500

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

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

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

(E) \$132,000 or more

Data for Question 46 (4 points)

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

Assumed annual rate of return on assets: 8.0%.

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

Effective interest rate for 2010: 6.0%.

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

Selected asset information:

Plan year	2010	2011
Market value at 1/1 (excluding receivables)	$580,000	$795,000
Benefit payments	$50,000	
Expenses	$35,000	

Contributions for the 2010 plan year:

Date	Amount
7/1/2010	$50,000
9/1/2011	$150,000

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

Question 46

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

(A) Less than $830,000

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

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

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

(E) $860,000 or more

Data for Question 47 (2 points)

Selected valuation results as of 1/1/2011:

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

The plan has fewer than 500 participants.

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

Consider the following statement:

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

Question 47

Which of the following describes the above statement?

(A) The statement is true

(B) The statement is false

(C) There is insufficient information to determine if the statement is true or false.

Data for Question 48 (4 points)

Assumed annual rate of return on assets: 7.0%.

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

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

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

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

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

Question 48

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

(A) Less than $2,395,000

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

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

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

(E) $2,410,000 or more

Data for Question 49 (4 points)

Type of plan: Multiemployer.

Plan effective date: 1/1/1994.

Normal retirement benefit: 50% of final compensation.

Actuarial cost method: Entry age normal.

Valuation interest rate: 6.0%.

Assumed rate of compensation increases: 3.0%.

Data for participant Smith:

Date of birth	1/1/1961
Date of hire	1/1/1994
2010 compensation	\$100,000

Selected annuity factor:

$$\ddot{a}_{65}^{(12)} = 11.3119$$

Question 49

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

(A) Less than \$200,000

(B) \$200,000 but less than \$215,000

(C) \$215,000 but less than \$230,000

(D) \$230,000 but less than \$245,000

(E) \$245,000 or more

Data for Question 50 (5 points)

Plan effective date: 1/1/2000.

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

Selected valuation results:

	1/1/2010	1/1/2011
Funding target	$ 850,000	$986,800
Target normal cost	$100,000	$120,000
Actuarial (market) value of assets	$636,000	$902,000
Effective interest rate	6.0%	6.0%

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

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

No shortfall amortization bases were established before 2010.

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

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

The plan sponsor is considering the following two contribution options:

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

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

Question 50

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

(A) Less than ($12,500)

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

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

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

(E) $62,500 or more

Data for Question 51 (4 points)

Type of plan: Multiemployer.

Plan effective date: 1/1/2010.

Actuarial cost method: Entry age normal.

Asset value method: Market value of assets.

Valuation interest rate: 7.0%.

Selected valuation results:

	1/1/2010	1/1/2011
Accrued liability	$1,000,000	$1,184,000
Normal cost	$200,000	$220,000
Actuarial (market) value of assets	$0	

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

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

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

Question 51

In what range is ***X***?

(A) Less than $185,000

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

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

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

(E) $305,000 or more

Data for Question 52 (2 points)

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

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

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

Question 52

Which of the following statement is true?

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

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

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

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

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

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Exam EA-2A
November 2010
Answer Key
Updated December 2010

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

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