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

Enrolled Actuaries Pension Examination, Segment F

EA-2, Segment F

Date: Thursday, November 9, 2023

INSTRUCTIONS TO CANDIDATES

1. Special conditions generally applicable to all questions on this examination are found in a separate .PDF on the computer screen.

2. All questions should be answered in accordance with laws, rules and regulations in effect as of May 31, 2023.

3. This examination consists of 59 multiple-choice questions of varying value. The point value for each question is shown in parentheses at the beginning of each question. Total point value is 160.

4. Your score will be based on the point values for the questions that you answer correctly. No credit will be given for omitted answers and no credit will be lost for wrong answers; hence, you should answer all questions even those for which you have to guess. Answer choices C, D, and E will be considered incorrect answers on True-False questions.

5. Do not spend too much time on any one question. If a question seems too difficult, leave it and go on.

6. While every attempt is made to avoid defective questions, sometimes they do occur. If you believe a question is defective, the supervisor or proctor cannot give you any guidance beyond the instructions on the computer screen.

7. Use the scratch paper booklets provided by Prometric for your scratch work. Extra scratch paper booklets are available if you run out of scratch paper in the booklet provided to you.

Answer Key EA-2F Fall 2023
August 18, 2023

Question	Answer		Question	Answer
1	D		31	A
2	B		32	B
3	C		33	C
4	C		34	B
5	B		35	C
6	D		36	B
7	B		37	B
8	D		38	B
9	B		39	B
10	C		40	B
11	A		41	C
12	C		42	C
13	C		43	C
14	C		44	E
15	B		45	D
16	C		46	C
17	C		47	E
18	C		48	B
19	B		49	E
20	C		50	D
21	B		51	D
22	D		52	A
23	A		53	A
24	B		54	A
25	B		55	C
26	A		56	A
27	B		57	C
28	B		58	D
29	C		59	C
30	C			

Data for Question 1 (2 points)

Valuation date: 1/1/2024

The plan year is a short plan year that runs from 1/1/2024 to 6/30/2024.

Selected information as of 1/1/2024 for the short plan year:

Prefunding balance	$0
Actuarial (market) value of assets	490,000
Funding target	500,000
Target normal cost	35,000

The shortfall amortization charge for 2024 before the change to the short plan year was $5,000.

$X equals the **smallest amount that satisfies the minimum funding standard** as of 1/1/2024 for the short plan year.

Question 1

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

(A) Less than $22,000

(B) $22,000 but less than $27,500

(C) $27,500 but less than $33,000

(D) $33,000 but less than $38,500

(E) $38,500 or more

Data for Question 2 (1 point)

Type of plan: Multiemployer

Consider the following statement regarding the funding standard account credit balance:

> The credit balance is adjusted to reflect interest to the end of the plan year using the actual rate of return on plan assets for the plan year.

Question 2

Is the above statement true or false?

(A) True

(B) False

Data for Question 3 (4 points)

Type of plan: Multiemployer

Valuation date: 1/1/2024

Actuarial cost method: Unit credit

Normal retirement benefit: $150 per month per year of service

Early retirement benefit: Accrued benefit reduced by 4.00% for each year that the benefit commencement date precedes age 65

Valuation interest rate: 6.00%

Normal and assumed form of payment: Single life annuity

Pre-retirement decrements other than death: None

Selected data for participant Smith:

Gender	Female
Date of birth	1/1/1962
Date of hire	1/1/2004
Date of retirement	12/31/2023
Elected form of annuity	5-year certain and life

Plan conversion factor for 5-year certain and life annuity for participant Smith: 0.98

$X is the absolute value of the experience gain/loss as of 1/1/2024 due to Smith's retirement and benefit election.

Question 3

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

(A) Less than $34,000

(B) $34,000 but less than $37,250

(C) $37,250 but less than $40,500

(D) $40,500 but less than $43,750

(E) $43,750 or more

Data for Question 4 (3 points)

Type of plan: Multiemployer

Valuation date: 1/1/2024

Actuarial cost method: Entry age normal

Valuation interest rate: 6.00%

Credit balance as of 12/31/2023: $40,000

On 1/1/2024, the plan is amended to increase the benefit multiplier from $70 to $80 for all years of service.

All participants are active and no participants will attain normal retirement age by 12/31/2024.

Selected information as of 1/1/2024 (before amendment):

Actuarial (market) value of assets	$600,000
Actuarial accrued liability	650,000
Normal cost	60,000
Net amortization charges	10,000

$X is the **smallest amount that satisfies the minimum funding standard** as of 12/31/2024.

Question 4

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

(A) Less than $44,000

(B) $44,000 but less than $48,000

(C) $48,000 but less than $52,000

(D) $52,000 but less than $56,000

(E) $56,000 or more

Data for Question 5 (3 points)

Type of plan: Multiemployer

Valuation date: 1/1/2024

Certified status for 2023: Endangered

Actuarial cost method: Entry age normal

Valuation interest rate: 6.50%

Credit balance as of 12/31/2023 before the 12/31/2023 contribution: $100,000

Selected information as of 1/1/2023:

Actuarial (market) value of assets	$550,000
Actuarial accrued liability	700,000
Normal cost (entry age normal)	70,000
Present value of accrued benefits (unit credit)	680,000
Normal cost (present value of accrued benefits)	75,000
Expected benefit payments	30,000

All benefit payments are assumed to be paid in the middle of the year.

The plan is not projected to have a funding deficiency for at least 10 years.

The market value of assets before the 12/31/2023 contribution: $600,000

$X is the sole 2023 plan year contribution, made on 12/31/2023 in the smallest amount that allows the plan to be certified not to be in endangered, critical or critical and declining status for 2024.

Question 5

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

(A) Less than $15,000

(B) $15,000 but less than $25,000

(C) $25,000 but less than $35,000

(D) $35,000 but less than $45,000

(E) $45,000 or more

Data for Question 6 (3 points)

Type of plan: Multiemployer

Valuation date: 1/1/2024

Actuarial cost method: Entry age normal

Valuation interest rate: 6.50%

Credit balance as of 12/31/2023: $200,000

Selected information as of 1/1/2024:

Normal cost	$300,000
Amortization charges for bases established on or before 1/1/2024	90,000
Amortization credits for bases established on or before 1/1/2024	80,000

The plan entered critical status as of 1/1/2023. The Rehabilitation Plan requires an hourly contribution rate increase of $0.25 per hour effective 7/1/2024.

Selected information regarding contributions:

Hourly contribution rate before the Rehabilitation Plan	$2.50
Hours from 1/1/2024 through 6/30/2024 with contributions paid 6/30/2024	50,000
Hours from 7/1/2024 through 12/31/2024 with contributions paid 12/31/2024	40,000

$X is the credit balance as of 12/31/2024.

Question 6

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

(A) Less than $100,000

(B) $100,000 but less than $110,000

(C) $110,000 but less than $120,000

(D) $120,000 but less than $130,000

(E) $130,000 or more

Data for Question 7 (1 point)

Type of plan: Multiemployer

Consider the following statement with respect to the maximum amount deductible as determined under IRC section 404:

The maximum amount deductible is the greater of:

I. The normal cost plus a 10-year amortization of the unfunded accrued liability, and

II. 140% of the excess of the plan's current liability over the plan's market value of assets.

Question 7

Is the above statement true or false?

(A) True

(B) False

Data for Question 8 (3 points)

Type of plan: Multiemployer

Valuation date: 1/1/2024

Actuarial cost method: Entry age normal

Selected information as of 1/1/2024:

Market value of assets	\$760,000
Actuarial value of assets	780,000
Actuarial accrued liability (entry age normal)	1,300,000
Actuarial accrued liability (unit credit)	1,200,000

The plan was certified not to be in endangered, seriously endangered, critical, or critical and declining status for all years before the 2024 plan year.

The plan is certified to be in endangered status as of 1/1/2024.

X is the funded percentage the plan is required to reach at the close of the plan's Funding Improvement Period.

Question 8

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

(A) Less than 72.00%

(B) 72.00% but less than 74.00%

(C) 74.00% but less than 76.00%

(D) 76.00% but less than 78.00%

(E) 78.00% or more

Data for Question 9 (2 points)

Type of plan: Multiemployer

Valuation date: 1/1/2024

The plan has been certified as being in critical status every year since 2016.

Accumulated funding deficiency as of 12/31/2024: $2,000,000

The plan failed to make scheduled progress under its Rehabilitation Plan for the 2022, 2023, and 2024 plan years.

Contribution necessary to make scheduled progress as of 1/1/2024: $1,000,000

Consider the following statement:

> The excise tax for failure to make scheduled progress is $200,000.

Question 9

Is the above statement true or false?

(A) True

(B) False

Data for Question 10 (3 points)

Valuation date: 1/1/2024

Segment rates: {5.00%, 6.00%, 7.00%}

Selected information as of 1/1/2024:

Funding standard carryover balance	$150,000
Prefunding balance	70,000
Actuarial (market) value of assets	900,000
Funding target	850,000
Target normal cost	110,000

No funding balances are applied to the 2024 minimum required contribution.

All shortfall amortization installments established before 2024:

Date established	Installment
1/1/2023	$7,500

$X is the **minimum required contribution** as of 1/1/2024.

Question 10

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

(A) Less than $50,000

(B) $50,000 but less than $85,000

(C) $85,000 but less than $120,000

(D) $120,000 but less than $155,000

(E) $155,000 or more

Data for Question 11 (1 point)

A short plan year begins on 1/1/2024 and ends on 5/31/2024.

The plan had a funding shortfall for the 2023 plan year.

Minimum required contribution for the 2024 short plan year: $100,000

Consider the following statement:

> The required installments under IRC section 430(j) are due on 4/15/2024 and 6/15/2024.

Question 11

Is the above statement true or false?

(A) True

(B) False

Data for Question 12 (4 points)

Valuation date: 1/1/2024

Normal retirement benefit: 2.50% of final compensation per year of service (not greater than 30 years of service)

Early retirement benefit: Accrued benefit reduced by 2.50% for each year that the benefit commencement date precedes age 65

Segment rates: {5.00%, 6.00%, 7.00%}

Assumed annual rate of compensation increases: 4.00%

Assumed retirement rates before 1/1/2024: 100% at age 65

Assumed retirement rates beginning 1/1/2024: 50% at age 62, 100% at age 65

Selected annuity factors:

Interest rate	$\ddot{a}^{(12)}_{62:\overline{13}\vert}$	${}_{13\vert}\ddot{a}^{(12)}_{62}$	$\ddot{a}^{(12)}_{65:\overline{10}\vert}$	${}_{10\vert}\ddot{a}^{(12)}_{65}$
6%	8.8269	3.7611	7.3350	4.5359
7%	8.3859	3.1286	7.0414	3.8807

Selected data for active participant Smith as of 1/1/2024:

Date of birth	1/1/1969
Date of hire	1/1/1994
2023 compensation	$200,000

$X is the absolute value of the change in the target normal cost for Smith as of 1/1/2024 due to the change in retirement assumptions.

Question 12

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

(A) Less than $2,000

(B) $2,000 but less than $3,400

(C) $3,400 but less than $4,800

(D) $4,800 but less than $6,200

(E) $6,200 or more

Data for Question 13 (3 points)

Selected information as of January 1:

	2022	2023	2024
Minimum required contribution	0	\$250,000	\$400,000
Effective interest rate	6.00%	5.50%	5.00%

Prefunding balance as of 1/1/2022: \$100,000

Actual rate of return on plan assets for all years: 6.00%

There are no required quarterly installments for the plan years shown above.

The sole contribution made for the plan years shown above, made on 9/15/2025: \$175,000

There are standing elections in effect such that funding balances are used to meet minimum contribution requirements.

\$X is the initial excise tax due on the unpaid minimum required contribution for the 2024 plan year under IRC section 4971(a).

Question 13

In what range is ***\$X***?

(A) Less than \$37,500

(B) \$37,500 but less than \$38,500

(C) \$38,500 but less than \$39,500

(D) \$39,500 but less than \$40,500

(E) \$40,500 or more

Data for Question 14 (4 points)

Type of plan: Multiemployer

Actuarial cost method: Unit credit

Valuation interest rate: 5.00%

Credit balance as of 12/31/2023: $75,000

Selected valuation results:

	1/1/2023	1/1/2024
Actuarial accrued liability	$3,500,000	$4,250,000
Normal cost	325,000	410,000
Expected benefit payments	450,000	
Total amortization charges	250,000	
Total amortization credits	75,000	

Benefit payments are assumed to be paid in the middle of the year for each plan year.

There were no changes in assumptions nor plan amendments recognized in the 1/1/2024 valuation.

There were no asset gains or losses during 2023.

None of the amortization charges and credits from the 1/1/2023 valuation will be fully amortized before 2025.

$X is the **smallest amount that satisfies the minimum funding standard** for the 2024 plan year as of 12/31/2024.

Question 14

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

(A) Less than $540,000

(B) $540,000 but less than $585,000

(C) $585,000 but less than $630,000

(D) $630,000 but less than $675,000

(E) $675,000 or more

Data for Question 15 (2 points)

Type of plan: Multiemployer

A plan sponsor would like to extend the period of years required to amortize the plan's unfunded liability.

Consider the following statements that could potentially be part of the plan actuary's certification in order for the Secretary to automatically extend the period of years required to amortize the unfunded liability:

I. The plan sponsor has adopted a plan to improve the plan's funding status.

II. Without an amortization extension, the plan is projected to have an accumulated funding deficiency in the current plan year or one of the 10 succeeding plan years.

III. With an amortization extension, the plan is projected to have sufficient assets to timely pay expected benefits and anticipated expenditures over the amortization period.

Question 15

Which, if any, of the above statements is (are) needed for the automatic extension to be granted?

(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 16 (3 points)

Valuation date: 1/1/2024

Segment rates: {5.00%, 6.00%, 7.00%}

Selected information as of 1/1/2024:

Actuarial (market) value of assets	$8,000,000
Funding target	9,200,000
Prefunding balance	50,000

All shortfall amortization installments established before 1/1/2024:

Year established	Installment
2022	$40,000
2023	20,000
Total	$60,000

$X is the shortfall amortization charge as of 1/1/2024.

Question 16

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

(A) Less than $114,000

(B) $114,000 but less than $124,000

(C) $124,000 but less than $134,000

(D) $134,000 but less than $144,000

(E) $144,000 or more

Data for Question 17 (2 points)

A plan is in at-risk status for five consecutive years, including the current plan year.

The early retirement eligibility for the plan is age 50.

Consider the following statements regarding the special assumptions required to be used to determine the at-risk funding target for the current plan year:

I. All active participants who are under age 50 as of the valuation date are assumed to terminate and commence payment at age 50.

II. The special retirement age assumptions do not affect termination assumptions before the employee's earliest retirement age.

III. All active participants are assumed to elect the most valuable form of benefit at retirement.

Question 17

Which, if any, of the above statements 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 18 (2 points)

Consider the following statements regarding a waiver of the minimum required contribution:

I. The outstanding balance of a waiver amortization base on a valuation date is equal to the present value of the remaining payments based on the segment rates that applied for the year when the waiver was granted.

II. If there is no funding shortfall on a valuation date, all prior waiver amortization bases are deemed to be fully amortized.

III. Once the waiver amortization installments have been determined, the amortization installments are not re-determined in subsequent years even if the segment rates change.

Question 18

Which, if any, of the above statements 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 19 (3 points)

Valuation date: 1/1/2024

2023 AFTAP: 80.00%

Normal retirement benefit: $50 per month per year of service

A plan amendment is adopted on 3/1/2024 that increases the benefit multiplier to $55 per month per year of service for years of service after 2023.

Segment rates: {5.00%, 6.00%, 7.00%}

Selected information as of 1/1/2024 before plan amendment:

Prefunding balance	$0
Funding target	5,250,000
Actuarial (market) value of assets	4,220,000
Target normal cost	400,000

No shortfall amortization bases were established before 2024.

$X is the **minimum required contribution** as of 1/1/2024.

Question 19

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

(A) Less than $520,000

(B) $520,000 but less than $540,000

(C) $540,000 but less than $560,000

(D) $560,000 but less than $580,000

(E) $580,000 or more

Data for Question 20 (4 points)

Plan effective date: 1/1/2010

Valuation date: 1/1/2024

Normal retirement benefit: 1.50% of highest consecutive three-year average compensation per year of service

Segment rates: {5.00%, 6.00%, 7.00%}

Assumed rate of compensation increases: 4.00% per year

Assumed IRC section 401(a)(17) limit for 2024: $350,000

Selected data for participant Smith as of 1/1/2024:

Gender	Male
Age	43
Service	10
2021 compensation	$295,000
2022 compensation	298,000
2023 compensation	303,000

$X is the target normal cost for Smith as of 1/1/2024.

Question 20

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

(A) Less than $13,300

(B) $13,300 but less than $13,800

(C) $13,800 but less than $14,300

(D) $14,300 but less than $14,800

(E) $14,800 or more

Data for Question 21 (4 points)

Plan type: Multiemployer

Valuation date: 1/1/2024

Asset valuation method: Smoothed market value using a smoothing period of four years (smoothing of difference between expected and actual market value of assets) as described in Rev. Proc. 2000-40

Valuation interest rate: 7.00%

Selected asset information:

	1/1/2023	1/1/2024
Market value of assets	$500,000	$550,000

Sole contribution for the 2023 plan year, made on 9/1/2023: $42,000

Benefit payments paid during 2023: $65,000

Benefit payments are assumed to be paid in the middle of the year.

Market value asset gain/loss amounts:

	Type	Amount
During 2021	Loss	$30,000
During 2022	Gain	9,000

$X is the actuarial value of assets as of 1/1/2024.

Question 21

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

(A) Less than $523,300

(B) $523,300 but less than $533,300

(C) $533,300 but less than $543,300

(D) $543,300 but less than $553,300

(E) $553,300 or more

Data for Question 22 (2 points)

Consider the following statements regarding setting actuarial assumptions:

I. It is generally reasonable to use higher retirement rates at ages before early retirement subsidies are first available.

II. Vesting provisions should not be considered when setting an assumption for termination rates.

III. It is generally reasonable to use published tables to set an assumption for termination rates if sufficient historical experience is not available or the plan population is small.

Question 22

Which, if any, of the above statements 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 23 (3 points)

Valuation date: 1/1/2024

Normal retirement benefit: 1.50% of final compensation per year of service

Segment rates: {5.00%, 6.00%, 7.00%}

Assumed rate of compensation increases: 3.50% per year

Selected data for active participant Smith as of 1/1/2024:

Gender	Male
Age	60
Service	8
2023 compensation	$60,000

$X is the funding target for Smith as of 1/1/2024.

Question 23

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

(A) Less than $60,000

(B) $60,000 but less than $75,000

(C) $75,000 but less than $90,000

(D) $90,000 but less than $105,000

(E) $105,000 or more

Data for Question 24 (4 points)

Valuation date: 1/1/2024

Selected valuation results as of 1/1/2023:

Funding target attainment percentage	95.00%
Effective interest rate	5.00%

Actual rate of return on assets during 2023: 10.00%

Selected information as of 1/1/2024:

Prefunding balance	$90,000
Required quarterly installment	25,000
Effective interest rate	6.00%

On 7/1/2024, the plan sponsor elects to apply the entire prefunding balance to offset the 2024 minimum required contribution. The plan sponsor makes no contributions for the 2024 plan year until 6/15/2025.

$X is the contribution amount on 6/15/2025 needed to satisfy the fourth quarterly installment for the 2024 plan year.

Question 24

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

(A) Less than $6,200

(B) $6,200 but less than $6,300

(C) $6,300 but less than $6,400

(D) $6,400 but less than $6,500

(E) $6,500 or more

Data for Question 25 (1 point)

Consider the following statement:

> The determination of the funding target must take into account any limitation on unpredictable contingent event benefits under IRC section 436 with respect to unpredictable contingent events that are expected to occur on or after the valuation date.

Question 25

Is the above statement true or false?

(A) True

(B) False

Data for Question 26 (1 point)

Consider the following statement

> Pursuant to IRC section 4971(a), employers that fail to meet their minimum funding requirements will incur an initial 10% excise tax on the aggregate unpaid minimum required contributions.

Question 26

Is the above statement true or false?

(A) True

(B) False

Data for Question 27 (3 points)

Type of plan: Multiemployer

Actuarial cost method: Entry age normal

Valuation interest rate: 6.50%

Credit balance as of 12/31/2022: $0

Actual rate of return on assets during both 2023 and 2024: 4.00% per year

Selected information:

	1/1/2023	1/1/2024
Normal cost	$675,000	$600,000
Total amortization charges	250,000	200,000
Total amortization credits	200,000	150,000

Contribution information:

Date	Amount	Plan year
1/1/2023	$750,000	2023
7/1/2024	700,000	2024

There were no other contributions made for the 2023 and 2024 plan years.

$X is the credit balance as of 12/31/2024.

Question 27

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

(A) Less than $45,000

(B) $45,000 but less than $60,000

(C) $60,000 but less than $75,000

(D) $75,000 but less than $90,000

(E) $90,000 or more

Data for Question 28 (1 point)

Valuation date: 1/1/2024

The plan has always had at least 10,000 active participants.

The plan's active decrement assumptions have not been reviewed by the enrolled actuary in ten years.

The plan has experienced minimal gains and losses from all causes combined in the last ten years.

Consider the following statement:

> It is reasonable for the actuary to not review demographic assumptions for the 1/1/2024 valuation.

Question 28

Is the above statement true or false?

(A) True

(B) False

Data for Question 29 (3 points)

Valuation date: 1/1/2024

No quarterly contributions are required for the 2024 plan year.

Selected information as of 1/1/2024:

Prefunding balance	\$200,000
Actuarial (market) value of assets	920,000
Funding target	680,000
Minimum required contribution	100,000
Effective interest rate	5.50%

Actual rate of return on assets for 2024: negative 2.00%

Sole contribution for the 2024 plan year, made on 9/1/2024: \$175,000

\$X is the prefunding balance as of 1/1/2025.

Question 29

In what range is ***\$X***?

(A) Less than \$260,000

(B) \$260,000 but less than \$265,000

(C) \$265,000 but less than \$270,000

(D) \$270,000 but less than \$275,000

(E) \$275,000 or more

Data for Question 30 (2 points)

Valuation date: 1/1/2024

Effective interest rate for the 2023 plan year: 6.00%

Actual rate of return on assets during 2023: 3.50%

Summary of all contributions for the 2023 plan year:

Date	Amount
6/1/2023	$10,000
9/1/2024	50,000

Effective interest rate for the 2024 plan year: 7.00%

Market value of assets as of 1/1/2024 (excluding receivable contributions): $500,000

$X is the market value of assets as of 1/1/2024 (including receivable contributions).

Question 30

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

(A) Less than $547,700

(B) $547,700 but less than $548,000

(C) $548,000 but less than $548,300

(D) $548,300 but less than $548,600

(E) $548,600 or more

Data for Question 31 (2 points)

Data as of 1/1/2024.

Non-eligible employees	5
Active participants	45
Deferred vested participants	0
Retirees	60

During 2024, all non-eligible employees became plan participants and 11 retirees died with no beneficiaries.

There were no other changes to the plan participant counts during 2024.

Consider the following statements regarding the choice of actuarial assumptions:

I. The 2024 actuarial valuation must use pre-retirement mortality.

II. The 2024 actuarial valuation must use different mortality tables for annuitants and non-annuitants.

III. The 2025 actuarial valuation must use pre-retirement mortality.

Question 31

Which, if any, of the above statements 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 32 (2 points)

Valuation date: 1/1/2024

Effective 1/1/2024, the plan was amended to provide subsidized early retirement starting at age 62.

Assumed retirement rates before amendment:

Age	Rate
55-59	5%
60-64	20%
65	100%

The plan has 8,000 active participants as of 1/1/2024.

Due to the plan amendment, the actuary considered the following assumed retirement rates at 1/1/2024:

Age	Table I	Table II	Table III	Table IV	Table V
55-59	5%	5%	5%	5%	5%
60-61	20%	10%	10%	10%	40%
62	20%	40%	20%	10%	20%
63-64	20%	30%	40%	30%	30%
65	100%	100%	100%	100%	100%

Question 32

Which of the above tables provides the most reasonable assumption of retirement rates for the 1/1/2024 valuation?

(A) Table I

(B) Table II

(C) Table III

(D) Table IV

(E) Table V

Data for Question 33 (3 points)

Type of plan: Multiemployer

Valuation date: 1/1/2024

Actuarial cost method: Projected unit credit

Normal retirement benefit: 1.50% of final three-year average compensation per year of service

Valuation interest rate: 6.00%

Assumed rate of compensation increases: 3.50% per year

Selected data for active participant Smith:

Gender	Male
Date of birth	1/1/1964
Date of hire	1/1/2018
2023 compensation	$50,000

$X is the normal cost for Smith as of 1/1/2024.

Question 33

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

(A) Less than $7,000

(B) $7,000 but less than $7,250

(C) $7,250 but less than $7,500

(D) $7,500 but less than $7,750

(E) $7,750 or more

Data for Question 34 (4 points)

Type of plan: Multiemployer

Valuation date: 1/1/2024

Actuarial cost method: Entry age normal

Normal retirement benefit: $200 per month per year of service

Valuation interest rate: 6.00%

Selected data for active participant Smith:

Gender	Female
Date of birth	1/1/1962
Date of hire	1/1/2009

$X is the actuarial accrued liability for Smith as of 1/1/2024.

Question 34

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

(A) Less than $380,000

(B) $380,000 but less than $400,000

(C) $400,000 but less than $420,000

(D) $420,000 but less than $440,000

(E) $440,000 or more

Data for Question 35 (3 points)

Type of plan: Multiemployer

Valuation date: 1/1/2024

Actuarial cost method: Aggregate

Normal retirement benefit: $75 per month per year of service

Valuation interest rate: 7.00%

Credit balance as of 12/31/2023: $20,000

Actuarial value of assets as of 1/1/2024: $600,000

Number of active participants as of 1/1/2024: 10

Selected data for each active participant:

Gender	Female
Date of birth	1/1/1969
Date of hire	1/1/1999

$X is the normal cost as of 1/1/2024.

Question 35

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

(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 36 (1 point)

A plan covers two employee groups, Group I and Group II.

Valuation date: 1/1/2024

Selected data as of 1/1/2024:

Employee group	Number of participants
I	2,000
II	1,000

Consider the following statement:

> The plan actuary cannot select different actuarial assumptions for Group I and Group II that depend on each group's experience.

Question 36

Is the above statement true or false?

(A) True

(B) False

Data for Question 37 (4 points)

Type of plan: Statutory hybrid (cash balance)

Valuation date: 12/31/2024

The plan allows an immediate lump sum payment equal to the participant's hypothetical account balance upon termination of employment.

Annual pay credit: 10.00% of compensation provided on last day of the plan year

Interest crediting rate: 30-year Treasury rates from the month before the first day of the plan year

Selected information as of 12/31/2024:

Assumed projected interest crediting rate	3.50% per year
Segment rates	{5.00%, 6.00%, 7.00%}
Assumed form of payment	Lump sum

Selected 30-year Treasury rates:

December 2022	2.50%
December 2023	3.50%
December 2024	3.50%

Selected data for sole active participant Smith:

Date of birth	12/31/1963
Date of hire	1/1/2022
2022 compensation	\$100,000
2023 compensation	110,000
2024 compensation	120,000

$X is the funding target as of 12/31/2024.

Question 37

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

(A) Less than \$20,500

(B) \$20,500 but less than \$21,000

(C) \$21,000 but less than \$21,500

(D) \$21,500 but less than \$22,000

(E) \$22,000 or more

Data for Question 38 (4 points)

Type of plan: Statutory hybrid (cash balance)

Valuation date: 1/1/2024

The plan allows an immediate full or partial lump sum payment equal to the participant's hypothetical account balance, or a percentage thereof, upon termination of employment.

Interest crediting rate: 3%

Selected information as of 1/1/2024:

Segment rates	{5.00%, 6.00%, 7.00%}
Assumed form of payment	50% lump sum and 50% single life annuity

Data for sole active participant Smith as of 1/1/2024:

Gender	Female
Date of birth	1/1/1969
Hypothetical account balance	$75,000

Age 65 single life annuity conversion factor using plan's fixed actuarial equivalence basis: 9.800

Age 65 single life annuity conversion factor using IRC section 417(e)(3) 2024 applicable interest rates and mortality table: 10.200

$X is the funding target as of 1/1/2024.

Question 38

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

(A) Less than $59,000

(B) $59,000 but less than $60,000

(C) $60,000 but less than $61,000

(D) $61,000 but less than $62,000

(E) $62,000 or more

Data for Question 39 (4 points)

Valuation date: 1/1/2024

A plan amendment is adopted and effective 1/1/2024 that increases benefits for all years of service.

Normal retirement benefit before amendment: $100 per month per year of service

Normal retirement benefit after amendment: $140 per month per year of service

No shortfall amortization bases were established before 1/1/2024.

Segment rates: {5.00%, 6.00%, 7.00%}

Selected information as of 1/1/2024:

Prefunding balance	$0
Actuarial (market) value of assets	18,000

Selected data for active participant Smith, who is the sole participant in the plan:

Gender	Female
Date of birth	1/1/1979
Date of hire	1/1/2019

$X is the increase in the **minimum required contribution** as of 1/1/2024 due to the plan amendment.

Question 39

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

(A) Less than $2,300

(B) $2,300 but less than $3,300

(C) $3,300 but less than $4,300

(D) $4,300 but less than $5,300

(E) $5,300 or more

Data for Question 40 (1 point)

A plan sponsor failed to meet the minimum funding standards for the 2023 plan year.

The 2023 Form 5500 and all associated schedules, including the Schedule SB, were filed without extension on 7/31/2024.

Consider the following statement:

> The due date for the Form 5330 filing is 7/31/2024.

Question 40

Is the above statement true or false?

(A) True

(B) False

Data for Question 41 (3 points)

Valuation date: 1/1/2024

Plan actuarial equivalence: Applicable mortality table under IRC section 417(e)(3) and 5.00% interest

Assumed form of payment: Lump sum

Segment rates: {5.00%, 6.00%, 7.00%}

Selected data for active participant Smith as of 1/1/2024:

Gender	Female
Age	44
Monthly accrued benefit	$2,000

$\ddot{a}_{65}^{(12)}$ using applicable mortality table under IRC section 417(e)(3):

Interest rate	Factor
5.00%	12.973
6.00%	11.871
7.00%	10.922

$X is the funding target for Smith as of 1/1/2024.

Question 41

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

(A) Less than $65,000

(B) $65,000 but less than $73,000

(C) $73,000 but less than $81,000

(D) $81,000 but less than $89,000

(E) $89,000 or more

Data for Question 42 (4 points)

Valuation date: 1/1/2024

FTAP (without at-risk assumptions) as of 1/1/2023: 75.00%
FTAP (without at-risk assumptions) as of 1/1/2024: 75.00%

Selected valuation information as of 1/1/2024:

Number of participants	300
Funding target	$4,000,000
Target normal cost	0

Liquid assets as of 3/31/2024: $1,300,000

Historical disbursements	Annuity payments	Lump sums	Annuity purchases
1/1/2023 to 3/31/2023	$100,000	$0	$0
4/1/2023 to 6/30/2023	100,000	0	0
7/1/2023 to 9/30/2023	100,000	0	0
10/1/2023 to 12/31/2023	100,000	150,000	250,000
1/1/2024 to 3/31/2024	100,000	0	0

Minimum required contribution for the 2023 plan year: $240,000
Minimum required contribution for the 2024 plan year: $200,000

A contribution of $60,000 in liquid assets is made on 3/1/2024.

$X is the amount of liquid assets that must be deposited on 4/15/2024 to satisfy the required quarterly installment.

Question 42

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

(A) Less than $125,000

(B) $125,000 but less than $175,000

(C) $175,000 but less than $225,000

(D) $225,000 but less than $275,000

(E) $275,000 or more

Data for Question 43 (3 points)

Valuation date: 1/1/2024

Selected information as of 1/1/2024:

Funding standard carryover balance	$200,000
Prefunding balance	300,000
Target normal cost	365,000
Shortfall amortization charge	16,000
Effective interest rate	4.00%

Actual rate of return on assets during 2024: 7.80%

The plan sponsor contributes the **smallest amount that satisfies the minimum funding standard** on 1/1/2024.

$X is the prefunding balance as of 1/1/2025.

Question 43

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

(A) Less than $122,000

(B) $122,000 but less than $128,000

(C) $128,000 but less than $134,000

(D) $134,000 but less than $140,000

(E) $140,000 or more

Data for Question 44 (4 points)

Valuation date: 1/1/2024

Normal retirement benefit: 2.00% of high three-year average compensation per year of service

Disability eligibility: Age 60 with 10 years of service

Disability benefit: Immediate benefit equal to the projected benefit at normal retirement age assuming projected service to normal retirement and current high three-year average compensation

Selected valuation assumptions:

Disabled mortality is the same as healthy mortality
Segment rates: {5.00%, 6.00%, 7.00%}

The plan actuary identifies a participant Smith who became disabled on 12/31/2023 but had been valued as active with a funding target of $245,158 as of 1/1/2024.

Selected participant information for Smith:

Gender	Female
Date of birth	1/1/1963
Date of hire	1/1/2009
High three-year average compensation	$90,000

$X is the increase in the 1/1/2024 funding target for Smith to reflect her disability status.

Question 44

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

(A) Less than $90,000

(B) $90,000 but less than $120,000

(C) $120,000 but less than $150,000

(D) $150,000 but less than $180,000

(E) $180,000 or more

Data for Question 45 (4 points)

Valuation date: 1/1/2024

Segment rates: {4.75%, 5.25%, 5.75%}

Prefunding balance as of 1/1/2023: $50,000

No prefunding balance was applied to the 2023 minimum required contribution.

No prior plan year excess contributions were added to prefunding balance as of 1/1/2024.

Actual rate of return on assets during 2023: 9.00%

Selected information as of 1/1/2024:

Actuarial (market) value of assets	$700,000
Funding target	800,000
Target normal cost	150,000
Effective interest rate	5.75%

15-year shortfall amortization factor for the 2024 plan year: 10.7835

All shortfall amortization installments established before 2024:

Year established	Installment
2022	$5,000
2023	1,000

$X is the **minimum required contribution** as of 1/1/2024.

Question 45

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

(A) Less than $162,500

(B) $162,500 but less than $163,500

(C) $163,500 but less than $164,500

(D) $164,500 but less than $165,500

(E) $165,500 or more

Data for Question 46 (5 points)

Valuation date: 1/1/2024

Selected information:

	1/1/2023	1/1/2024
Prefunding balance	$0	$0
Actuarial (market) value of assets	900,000	1,050,000
Funding target	950,000	1,100,000
Minimum required contribution	100,000	150,000
Effective interest rate		5.75%

The minimum required contribution for the 2023 plan year was timely satisfied during 2023. No other contributions were made for the 2023 plan year.

A $50,000 contribution is deposited on 7/1/2024 for the 2024 plan year. This is the only contribution made for the 2024 plan year before 9/15/2025.

$X is the **smallest amount that satisfies the minimum funding standard** as of 9/15/2025.

Question 46

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

(A) Less than $112,000

(B) $112,000 but less than $113,000

(C) $113,000 but less than $114,000

(D) $114,000 but less than $115,000

(E) $115,000 or more

Data for Question 47 (2 points)

Valuation date: 1 /1/2024

A plan has always had fewer than 100 participants.

An amendment to increase benefits for all participants was adopted on 2/1/2022 and was effective on 1/1/2022.

The plan is undergoing a PBGC standard termination with a termination date of 12/31/2024.

Consider the following statements regarding the deduction limit for the 2024 plan year:

I. The deduction limit cannot be less than (i) the sum of the target normal cost, funding target, and cushion amount for the plan year less (ii) the actuarial value of assets reduced by the funding balances.

II. The change in the funding target attributable to increased benefits for highly compensated employees as a result of the amendment cannot be included in the cushion amount.

III. The deduction limit cannot be less than the amount required to make the plan sufficient for benefit liabilities.

Question 47

Which, if any, of the above statements 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 48 (1 point)

Valuation date: 1/1/2024

Consider the following statement:

> Under interest rate stabilization, no segment rate used for determining the funding target can be less than 5.00%.

Question 48

Is the above statement true or false?

(A) True

(B) False

Data for Question 49 (3 points)

Valuation date: 1/1/2024

The plan has always had more than 750 participants.

Selected valuation information as of 1/1/2024:

Actuarial (market) value of assets	$3,000,000
Funding target (without regard to at-risk assumptions)	3,000,000
At-risk funding target	3,500,000

$X is the largest possible prefunding balance as of 1/1/2024 to ensure the plan is not in at-risk status for the 2025 plan year.

Question 49

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

(A) Less than $535,000

(B) $535,000 but less than $555,000

(C) $555,000 but less than $575,000

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

(E) $595,000 or more

Data for Question 50 (3 points)

Valuation date: 1/1/2024

A plan offers a lump sum option.

2023 AFTAP: 88.50%

Selected information as of 1/1/2024:

Prefunding balance	$750,000
Actuarial (market) value of assets	1,500,000
Funding target	950,000

No contributions were made in 2024 for the 2023 plan year.

As of 4/1/2024, the actuary has not issued a 2024 AFTAP certification.

$X is the deemed reduction, effective 4/1/2024, to the 2024 prefunding balance that will avoid the limitation on accelerated benefit distributions under IRC section 436(d).

Question 50

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

(A) Less than $9,000

(B) $9,000 but less than $11,000

(C) $11,000 but less than $13,000

(D) $13,000 but less than $15,000

(E) $15,000 or more

Data for Question 51 (3 points)

Valuation date: 1/1/2024

The employer sponsors a defined benefit plan and a profit sharing plan.

The defined benefit plan is not covered by the PBGC.

The defined benefit plan was frozen 12/31/2018 and there have been no discretionary plan amendments.

The plans do not have any participants in common.

Participant information for all participants in the profit sharing plan:

Participant	Compensation
Smith	$250,000
Jones	150,000

Participant information for all participants in the defined benefit plan:

Participant	2024 Compensation	IRC section 404 funding target	IRC section 404 target normal cost
Brown	$125,000	$225,000	$0
Green	75,000	175,000	0

Actuarial value of assets for the defined benefit plan as of 1/1/2024: $325,000

There is no minimum required contribution for the 2024 plan year.

$X is the maximum deductible contribution for both plans combined for 2024.

Question 51

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

(A) Less than $180,000

(B) $180,000 but less than $260,000

(C) $260,000 but less than $340,000

(D) $340,000 but less than $420,000

(E) $420,000 or more

Data for Question 52 (4 points)

Valuation date: 1/1/2024

Normal retirement benefit: 8.00% of final three-year average compensation per year of service

Normal retirement age: 62

Selected valuation assumptions:

Segment rates	{5.00%, 6.00%,7.00%}
Assumed retirement age	62
Normal and assumed form of payment	Single life annuity

Selected information for participant Smith:

Gender	Male
Date of birth	1/1/1962
Date of hire	1/1/2014
Date of participation	1/1/2016
Compensation each year	$500,000

Assumed IRC section 415(b) limit for 2024: $280,000

$X is the funding target for Smith as of 1/1/2024.

Question 52

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

(A) Less than $2,700,000

(B) $2,700,000 but less than $3,200,000

(C) $3,200,000 but less than $3,700,000

(D) $3,700,000 but less than $4,200,000

(E) $4,200,000 or more

Data for Question 53 (1 point)

A plan had fewer than 100 participants on each day during the 2023 plan year.

The valuation date is the first day of the plan year.

The plan is terminating as of 8/15/2024 with the assets of the plan (exclusive of contributions receivable) sufficient to satisfy all benefit liabilities.

A timely notice of intent to terminate was filed with the PBGC.

Consider the following statement:

> The plan may change its valuation date to the plan termination date.

Question 53

Is the above statement true or false?

(A) True

(B) False

Data for Question 54 (1 point)

Consider the following statement:

> A plan sponsor may make a standing election to use the funding standard carryover balance and the prefunding balance to satisfy required quarterly contribution payments by providing written notification of the election to the plan's enrolled actuary and the plan administrator.

Question 54

Is the above statement true or false?

(A) True

(B) False

Data for Question 55 (3 points)

A plan provides plant shutdown benefits.

Valuation date: 1/1/2024

FTAP as of 1/1/2023: 103.00%

Actuarial (market) value of assets as of 1/1/2024: $700,000

Segment rates: {5.00%, 6.00%, 7.00%}

Selected valuation results as of 1/1/2024:

Assumed Probability of Shutdown	Funding Target	Target Normal Cost
0% in 2024 and each future year	$1,000,000	$150,000
15% in 2024 and each future year	1,100,000	250,000
100% in 2024	1,500,000	400,000

No IRC section 436 contribution will be paid in 2024 whether or not a plant shutdown occurs.

No unpredictable contingent event benefits were paid before 2024.

The plan actuary assumes that the probability of a plant shutdown is 15% for 2024 and each future year.

$X is the **minimum required contribution** as of 1/1/2024.

Question 55

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

(A) Less than $200,000

(B) $200,000 but less than $280,000

(C) $280,000 but less than $360,000

(D) $360,000 but less than $440,000

(E) $440,000 or more

Data for Question 56 (1 point)

A plan provides benefits based on compensation.

The plan is covered by the PBGC.

Consider the following statement:

> When determining the cushion amount under IRC section 404(o)(3), the plan may project increases in compensation for succeeding plan years as well as increases in the associated compensation limits under IRC section 401(a)(17).

Question 56

Is the above statement true or false?

(A) True

(B) False

Data for Question 57 (3 points)

Valuation date: 1/1/2024

Segment rates for 2023 and 2024 plan years: {5.00%, 6.00%, 7.00%}

The plan's FTAP was at least 100% for all plan years before 2023.

2023 shortfall amortization charge: $50,000

The actuarial value of assets as of 1/1/2024 was initially reported to be $2,500,000.

After the valuation was completed, the actuary learned that assets were actually $2,800,000. As a result, the actuary revises the valuation.

Selected valuation results as of 1/1/2024:

Actuarial (market) value of assets	$2,800,000
Funding target	2,750,000
Target normal cost	285,000
Prefunding balance	0

$X is the absolute value of the change in the **minimum required contribution** as of 1/1/2024 for the 2024 plan year as a result of the change in reported asset value.

Question 57

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

(A) Less than $30,000

(B) $30,000 but less than $75,000

(C) $75,000 but less than $120,000

(D) $120,000 but less than $165,000

(E) $165,000 or more

Data for Question 58 (3 points)

Type of plan: Multiemployer

Valuation date: 1/1/2024

Actuarial cost method: Entry age normal

Valuation interest rate: 7.00%

Actual return on plan assets during 2024: 6.00%

Credit balance as of 12/31/2023: $250,000

Selected valuation results as of 1/1/2024:

Normal cost	$750,000
Total amortization charges	150,000
Total amortization credits	75,000

Sole employer contribution for the 2024 plan year, made on 7/1/2024: $700,000

$X is the credit balance as of 12/31/2024.

Question 58

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

(A) Less than $86,500

(B) $86,500 but less than $94,500

(C) $94,500 but less than $102,500

(D) $102,500 but less than $110,500

(E) $110,500 or more

Data for Question 59 (4 points)

Type of plan: Multiemployer

Valuation date: 1/1/2024

Actuarial cost method: Unit credit

Valuation interest rate: 7.00%

Normal retirement benefit: $75 per month per year of service

Early retirement eligibility: Age 62 with 20 years of service

Early retirement benefit: Immediate commencement of unreduced accrued benefit

On 1/1/2024, the plan's actuary changes the assumed retirement age.

Assumed retirement age:

Before assumption change:	Age 65
After assumption change:	The earlier of age 65 or early retirement eligibility

Selected participant data as of 1/1/2024:

	Smith	Jones
Gender	Male	Male
Age	50	50
Service	10	5

$X is the increase in total actuarial accrued liability at 1/1/2024 for Smith and Jones as a result of the change in assumed retirement age.

Question 59

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

(A) Less than $3,000

(B) $3,000 but less than $7,000

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

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

(E) $15,000 or more

****END OF EXAMINATION****