

Data for Question 13

Normal retirement benefit: \$10 per month for each year of service prior to age 65.

Early or late retirement benefit: Actuarial equivalent of accrued benefit based on mortality and interest assumptions which are (coincidentally) the same as those used for valuation.

Vesting: 100% immediately.

Actuarial cost method: Accrued benefit (unit credit) method.

As of 1/1/82, there are no participants eligible for early or normal retirement.

Consider the following statements with respect to the 1/1/82 valuation of the plan.

- I. The choice of withdrawal assumption will have no effect on the valuation results.
- II. The choice of assumed retirement age will have no effect on the valuation results.
- III. If the plan is amended to provide full accrued benefits upon early retirement after age 62 and an assumed retirement age of 65 is used in the valuation, retirements prior to age 65 will be a source of experience loss.

Question 13

Which, if any, of these 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

1986

Data for Question No. 18

Normal retirement benefit: \$1,000 per year, payable annually for life at the beginning of the year.

Assumed interest rate: 7%.

It is assumed that there are no terminations prior to retirement, other than by death.

Assumed retirement age: 65.

The sole participant is age 55 as of 1/1/86.

Selected values and commutation functions:

$i$	$a_{65}^{\infty}$	$D_{55}$	$D_{65}$
3%	11.70	1,778	1,149
4%	10.82	1,045	613
5%	10.04	617	329
7%	8.74	219	96

Effective 1/1/86 the plan is amended to provide an automatic post-retirement adjustment which will increase each annual payment by 3% of the preceding payment.

Question No. 18

In what range is the increase in the present value of future benefits as of 1/1/86 due to the amendment?

- (A) Less than \$925
- (B) \$925 but less than \$1,425
- (C) \$1,425 but less than \$1,925
- (D) \$1,925 but less than \$2,425
- (E) \$2,425 or more

1990

Data for Question 5

Normal retirement benefit: \$10 per month for each year of service.

Vesting eligibility: 100% after 5 years of service.

Preretirement death benefit: None.

Actuarial cost method: Unit credit.

Actuarial assumptions:

Interest rate: 7% per year.

Preretirement terminations other than deaths: Occur at end of year.

$$q_x^{(d)} = q_x^{(d)}$$

Retirement age: 65.

Data for sole participant:

Date of birth	1/1/27
Date of hire	1/1/85
Status as of 1/1/90	Active

Selected probabilities and annuity value:

<u>x</u>	<u><math>q_x^T</math></u>	<u><math>q_x^{(d)}</math></u>
63	.069	.019
64	.081	.021
65	.023	.023

$$q_x^T = q_x^{(d)} + q_x^{(w)}$$

$$\ddot{a}_{65}^{(12)} = 8.736$$

Question 5

In what range is the normal cost for 1990 as of 1/1/90?

- (A) Less than \$872
- (B) \$872 but less than \$877
- (C) \$877 but less than \$882
- (D) \$882 but less than \$887
- (E) \$887 or more

2004

Data for Question 5 (3 points)

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

Early retirement benefit: None.

Plan vesting schedule:	<u>Years of service</u>	<u>Percent vested</u>
	Less than 3	0%
	3	20%
	4	40%
	5	60%
	6	80%
	7 or more	100%

Actuarial cost method: Unit credit.

Selected actuarial assumptions:

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

Other pre-retirement decrements      None

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

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

Selected annuity value:

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

### Question 5

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

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

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2004

Data for Question 34 (5 points)

Normal retirement benefit: 2% of final compensation times years of service.

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

Actuarial cost methods:

Retirement benefits	Unit credit
Death benefits	One-year term cost

Valuation interest rate: 7% per year.

Assumed compensation increases: 3% per year.

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

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

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

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

Selected annuity value and mortality rates:

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

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

Question 34

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

- (A) Less than \$16,000
- (B) \$16,000 but less than \$17,000
- (C) \$17,000 but less than \$18,000
- (D) \$18,000 but less than \$19,000
- (E) \$19,000 or more

2014

Data for Question 14 (4 points)

Valuation date: 1/1/2015.

Type of plan: Multiemployer.

Disability benefit: Immediate accrued benefit reduced 5% for each year benefit commencement precedes age 65.

Actuarial cost method: Unit credit.

Interest rate: 7.0%.

Pre-retirement decrements: None, other than disability occurring at beginning of year.

<u>Age</u>	<u>Disability rate</u>
63	0.065
64	0.075

Data for participant Smith:

Date of birth	1/1/1952
Monthly accrued benefit	\$4,500

Selected annuity factors:	$\ddot{a}_{63}^{(12)}$	$\ddot{a}_{64}^{(12)}$	$\ddot{a}_{65}^{(12)}$
Disabled mortality	9.00	8.65	8.35
Healthy mortality	10.55	10.33	10.11

Question 14

In what range is the accrued liability for Smith as of 1/1/2015?

- (A) Less than \$467,000
- (B) \$467,000 but less than \$474,000
- (C) \$474,000 but less than \$481,000
- (D) \$481,000 but less than \$488,000
- (E) \$488,000 or more

2015

Data for Question 7 (5 points)

Type of plan: Multiemployer.

Normal retirement benefit: \$45 per month per year of service.

Actuarial cost method: Entry age normal.

No pre-retirement decrements other than death are assumed.

Valuation interest rate: 7.0%.

Selected data for participant Smith:

Date of birth	1/1/1955
Date of hire	1/1/2010

Selected commutation functions:

Age	$D_x$	$N_x^{(12)}$
55	23,710	290,227
61	15,356	168,534
65	11,394	115,172
70	7,638	67,909

For the 1/1/2016 valuation, the assumed retirement age for Smith changed from age 65 to age 70.

The plan suspends benefits and the plan sponsor timely provides a suspension of benefits notice.

As of 1/1/2016, Smith's accrued liability decreases by \$X due to the change in assumed retirement age.

Question 7

In what range is \$X?

- (A) Less than \$6,000
- (B) \$6,000 but less than \$7,000
- (C) \$7,000 but less than \$8,000
- (D) \$8,000 but less than \$9,000
- (E) \$9,000 or more

2015

Data for Question 37 (4 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2016.

Normal retirement benefit: \$200 per month per year of service (up to a maximum of 20 years of service).

Pre-retirement death benefit: \$300,000 lump sum payment payable at the end of the year of death.

Actuarial cost method: Aggregate.

Valuation interest rate: 6.0%.

No pre-retirement decrements other than death are assumed.

	<u>Age 62</u>	<u>Age 63</u>	<u>Age 64</u>
Probability of death, decrement at end of year	0.0063	0.0075	0.0084

Selected data for participant Smith:

Gender	Male
Date of birth	1/1/1954
Date of hire	1/1/1986

Question 37

In what range is the present value of future benefits for Smith as of 1/1/2016?

- (A) Less than \$436,000
- (B) \$436,000 but less than \$437,000
- (C) \$437,000 but less than \$438,000
- (D) \$438,000 but less than \$439,000
- (E) \$439,000 or more