

1982

Data for Question 31

Normal retirement benefit: 1.5% of final five year average salary for each of the first 20 years of service, plus 1.0% of final five years average salary for each of the next 10 years of service.

Actuarial cost method: Projected unit credit method.

Assumed salary increases: 6% per year.

Assumed retirement age: 65.

It is assumed there are no terminations prior to age 65 other than by death.

Participant data as of 1/1/82 and selected annuity values:

	<u>Attained Age <math>x</math></u>	<u>1982 Annual Salary</u>	<u><math>65-x   \ddot{a}_x^{(12)}</math></u>
Smith	50	\$24,000	4
Brown	60	30,000	8

Both participants were hired at age 30.

Question 31

In what range is the normal cost for 1982 as of 1/1/82?

- (A) Less than \$2,000
- (B) \$2,000 but less than \$3,000
- (C) \$3,000 but less than \$4,000
- (D) \$4,000 but less than \$5,000
- (E) \$5,000 or more

## 2003

### Data for Question 24 (3 points)

Plan effective date: 1/1/2003.

Normal retirement age: 62.

Normal retirement benefit: 4% of final three-year average compensation for each year of service.

Actuarial cost method: Unit credit.

Selected valuation assumptions:

Valuation interest rate	7% per year
Salary increase	0% per year

Data for sole participant as of 1/1/2003:

Date of birth	1/1/1954
Date of hire	1/1/2001
2003 valuation compensation	\$190,000
2002 compensation	180,000
2001 compensation	170,000

Selected annuity values:

$$\ddot{a}_{62}^{(12)} = 9.25$$

### Question 24

In what range is the minimum required contribution for 2003 as of 12/31/2003?

- (A) Less than \$33,800
- (B) \$33,800 but less than \$34,800
- (C) \$34,800 but less than \$35,800
- (D) \$35,800 but less than \$36,800
- (E) \$36,800 or more

# 2014

## Data for Question 3 (3 points)

Type of plan: Multiemployer.

Actuarial cost method: Projected unit credit.

Valuation interest rate: 7.0%.

Compensation increase assumption: 3.0% per year.

Benefit formula: 2% of final year's compensation times years of service, maximum 25 years.

Selected data for participant Smith as of 1/1/2015:

Date of birth	1/1/1975
Date of hire	1/1/2005
Compensation for 2014 plan year	\$77,000

Selected annuity factor:

$$\ddot{a}_{65}^{(12)} = 10.11$$

## Question 3

In what range is the normal cost for Smith as of 1/1/2015?

- (A) Less than \$5,000
- (B) \$5,000 but less than \$7,000
- (C) \$7,000 but less than \$9,000
- (D) \$9,000 but less than \$11,000
- (E) \$11,000 or more

# 2014

## Data for Question 12 (5 points)

Type of plan: Multiemployer.

Normal retirement benefit: 2% of final compensation per year of service.

Actuarial cost method: Projected unit credit.

Selected actuarial assumptions as of 1/1/2015:

Interest rate	7.5%
Compensation increases	3.5% per year

Data for active participant Smith as of 1/1/2015:

Date of birth	1/1/1973
Date of hire	1/1/2011
2014 compensation	\$78,000

Selected annuity factors:

	<u>7.0%</u>	<u>7.5%</u>
$\ddot{a}_{65}^{(12)}$	10.11	9.72

$\$X$  is the change in Smith's normal cost as of 1/1/2015 if the sole assumption change is a reduction in the assumed interest rate from 7.5% to 7.0% for the 2015 valuation.

$\$Y$  is the change in Smith's normal cost as of 1/1/2015 if the sole assumption change is a reduction in the assumed compensation increase from 3.5% to 3.0% for the 2015 valuation.

## Question 12

In what range is  $|\$X| + |\$Y|$ ?

- (A) Less than \$500
- (B) \$500 but less than \$1,000
- (C) \$1,000 but less than \$1,500
- (D) \$1,500 but less than \$2,000
- (E) \$2,000 or more

# 2014

## Data for Question 20 (4 points)

Valuation date: 1/1/2015.

Type of plan: Multiemployer.

Normal retirement benefit: 1.25% of final three-year average compensation per year of service.

Late retirement benefit: 1.25% of final three-year average compensation per year of service without actuarial increases.

Actuarial cost method: Projected unit credit.

Selected assumptions:

Valuation interest rate	5.0%
Compensation increases	2.5% per year
Retirement age	Normal retirement or current age if later

Data for selected plan participants:	<u>Smith</u>	<u>Jones</u>
Date of birth	1/1/1948	1/1/1960
Date of hire	1/1/2000	1/1/2008
2012 compensation	\$40,000	\$62,000
2013 compensation	\$49,000	\$65,000
2014 compensation	\$52,000	\$68,000

Selected annuity factors:

$$\ddot{a}_{65}^{(12)} = 11.83 \quad \ddot{a}_{66}^{(12)} = 11.50 \quad \ddot{a}_{67}^{(12)} = 11.18$$

The plan sponsor has distributed all required suspension of benefits notices.

$\$X$  is the total accrued liability for Smith and Jones as of 1/1/2015.

## Question 20

In what range is  $\$X$ ?

- (A) Less than \$145,000
- (B) \$145,000 but less than \$155,000
- (C) \$155,000 but less than \$165,000
- (D) \$165,000 but less than \$175,000
- (E) \$175,000 or more

# 2015

## Data for Question 22 (3 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2016.

Normal retirement benefit: 60% of final three-year average compensation reduced prorata for years of service less than 30 at normal retirement date.

Actuarial cost method: Projected unit credit.

Valuation interest rate: 6.0%.

Assumed compensation increases: 3.0% per year.

Data for participant Smith as of 1/1/2016:

Gender	Male
Age	55
Years of service	10
Compensation:	
Before 2015	\$100,000
2015	250,000

Assume that the IRC section 401(a)(17) compensation limit for 2016 is \$265,000.

## Question 22

In what range is the actuarial accrued liability for Smith as of 1/1/2016?

- (A) Less than \$250,000
- (B) \$250,000 but less than \$350,000
- (C) \$350,000 but less than \$450,000
- (D) \$450,000 but less than \$550,000
- (E) \$550,000 or more

# 2015

## Data for Question 29 (3 points)

Type of plan: Multiemployer.

Normal retirement benefit: 1% of final three-year average compensation per year of service, limited to 30 years.

Actuarial cost method: Projected unit credit.

Selected assumptions:

Valuation interest rate	6.0%
Compensation increase	3.0% per year

Selected participant data for Smith:

Gender	Female
Date of birth	1/1/1958
Date of hire	1/1/1985
2015 compensation	\$60,000

$\$X$  is the actuarial accrued liability for Smith as of 1/1/2016.

$\$Y$  is the normal cost for Smith as of 1/1/2016.

## Question 29

In what range is  $\$X + \$Y$ ?

- (A) Less than \$160,000
- (B) \$160,000 but less than \$165,000
- (C) \$165,000 but less than \$170,000
- (D) \$170,000 but less than \$175,000
- (E) \$175,000 or more

# 2016

## Data for Question 20 (3 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2017.

Plan effective date: 1/1/2005.

Actuarial cost method: Projected unit credit.

Benefit formula: 1.3% of final three-year average compensation per year of service.

Valuation interest rate: 7.0%.

There are no pre-retirement decrements other than mortality.

Assumed rate of compensation increases: 5.0% per year.

Selected information for participant Smith as of 1/1/2017:

Gender	Female
Date of birth	1/1/1955
Date of hire	1/1/1989
2016 compensation	\$63,000

## Question 20

In what range is Smith's normal cost as of 1/1/2017?

- (A) Less than \$8,000
- (B) \$8,000 but less than \$10,500
- (C) \$10,500 but less than \$13,000
- (D) \$13,000 but less than \$15,500
- (E) \$15,500 or more



# 2016

## Data for Question 21 (3 points)

Type of plan: Multiemployer.

Valuation date: 1/1/2017.

Normal retirement benefit: 1.5% of final year's compensation per year of service.

Actuarial cost method: Projected unit credit.

Valuation interest rate: 5.0%.

Assumed compensation increases: 3.5% per year.

Selected data for participant Smith:

Gender	Female
Date of birth	1/1/1956
Date of hire	1/1/2000
2015 compensation	\$60,000
2016 compensation	70,000

$\$X$  is the change in the accrued liability for Smith due to actual 2016 compensation experience being different from assumed.

## Question 21

In what range is  $\$X$ ?

- (A) Less than \$21,000
- (B) \$21,000 but less than \$22,000
- (C) \$22,000 but less than \$23,000
- (D) \$23,000 but less than \$24,000
- (E) \$24,000 or more

# 2017

## Data for Question 23 (3 points)

Type of plan: Multiemployer

Valuation date: 1/1/2018

Actuarial cost method: Projected unit credit

Normal retirement benefit: 25% of final three-year average compensation, proportionally reduced for fewer than 25 years of service

Accrued benefit: Normal retirement benefit prorated over all years of service

Valuation interest rate: 6.00%

Assumed compensation increases: 3.00% per year

Selected data for active participant Smith:

Gender	Male
Date of birth	1/1/1968
Date of hire	1/1/2013
2017 compensation	\$125,000

Smith's compensation in all years before 2017 was less than \$125,000.

$\$X$  = the accrued liability as of 1/1/2018 for Smith.

## Question 23

In what range is  $\$X$ ?

- (A) Less than \$42,500
- (B) \$42,500 but less than \$53,000
- (C) \$53,000 but less than \$63,500
- (D) \$63,500 but less than \$74,000
- (E) \$74,000 or more

## 2017

Data for Question 39 (4 points)

Type of plan: Multiemployer

Valuation date: 1/1/2018

Plan effective date: 1/1/2007

Normal retirement benefit: 1.0% of final three-year average compensation for each year of service before 1/1/2015, plus

1.5% of final three-year average compensation for each year of service after 12/31/2014

Actuarial cost method: Projected unit credit

Valuation interest rate: 7.0%

Rate of assumed compensation increases: 5.0% per year

Selected data for active participant Smith as of 1/1/2018:

Gender	Female
Date of birth	1/1/1958
Date of hire	1/1/1995
2017 compensation	\$72,000

Smith's compensation in all years before 2017 was less than \$72,000.

$\$X$  = the normal cost for Smith as of 1/1/2018.

### Question 39

In what range is  $\$X$ ?

- (A) Less than \$7,000
- (B) \$7,000 but less than \$9,500
- (C) \$9,500 but less than \$12,000
- (D) \$12,000 but less than \$14,500
- (E) \$14,500 or more

Data for Question 36 (3 points)

Type of plan: Multiemployer

Valuation date: 1/1/2019

Normal retirement benefit: 2.00% of the highest consecutive three-year average compensation per year of service

Actuarial cost method: Projected unit credit

Interest rate: 7.00%

Assumed rate of compensation increases: 1.50% per year

Selected annuity factor at 7% interest:

$$\ddot{a}_{65}^{(12)} \quad 10.11$$

Data for participant Smith:

Date of birth      1/1/1974

Date of hire      1/1/2014

Compensation	<u>2016</u>	<u>2017</u>	<u>2018</u>
	\$98,000	\$99,000	\$100,000

$\$X$  is the accrued liability for Smith as of 1/1/2019.

Question 36

In what range is  $\$X$ ?

- (A) Less than \$28,500
- (B) \$28,500 but less than \$30,500
- (C) \$30,500 but less than \$32,500
- (D) \$32,500 but less than \$34,500
- (E) \$34,500 or more