Data for Question 13

Actuarially equivalent optional annuities:

Annuity A: $10,000 payable each 1/1 for 10 years certain.

Annuity B: $7,600 payable each 1/1 for life with 10 years certain.

Annuity C: $P payable each 1/1 for 10 years certain; after the certain period, 110% of $P payable each 1/1 for life.

Question 13

In what range is $P?

[A] Less than $7,000

[B] $7,000 but less than $7,150

[C] $7,150 but less than $7,300

[D] $7,300 but less than $7,450

[E] $7,450 or more

Data for Question 13 (3 points)

Smith is entitled to an annual life annuity-due of $30,000 beginning 1/1/2004.

Instead of the life annuity, Smith elects an actuarially equivalent benefit that pays the following:

$50,000 lump sum on 1/1/2004, plus

5-year term certain annuity-due that pays X per year starting 1/1/2007, if Smith survives to 1/1/2007.

Smith is age 62 as of 1/1/2004.

i = 7%, compounded annually

$\ddot{a}_{62} = 12.67977$

${}_np_x = 0.99^n$, for $x \leq 65$

Question 13

In what range is X?

(A) Less than $80,000

(B) $80,000 but less than $85,000

(C) $85,000 but less than $90,000

(D) $90,000 but less than $95,000

(E) $95,000 or more

Data for Question 14 (3 points)

Smith's monthly retirement benefit is as follows:

10-year certain and life annuity-due: $3,000.

Instead of this annuity, Smith elects an actuarially equivalent life annuity-due paying X per month.

Smith is age 62.

i = 7%, per annum, effective.

$\ddot{a}_{62}^{(12)} = 9.61521$

$\ddot{a}_{62:\overline{10}|}^{(12)} = 6.94029$

Question 14

In what range is X?

(A) Less than $3,050

(B) $3,050 but less than $3,100

(C) $3,100 but less than $3,150

(D) $3,150 but less than $3,200

(E) $3,200 or more

Data for Question 15 (3 points)

Annual retirement benefits for Smith and Jones are as follows:

Smith: 5-year temporary life annuity-due of X.

Jones: 10-year certain and life annuity-due of $20,000.

The present value of Jones' annuity is 4 times that of Smith's.

Smith is age 61.

Jones is age 60.

i = 7% per annum

$\ddot{a}_{60} = 11.53496$ $\ddot{a}_{62:\overline{4}|} = 3.58056$

$\ddot{a}_{60:\overline{10}|} = 7.26514$ $p_{61} = 0.99394$

Question 15

In what range is X?

(A) Less than $13,050

(B) $13,050 but less than $13,350

(C) $13,350 but less than $13,650

(D) $13,650 but less than $13,950

(E) $13,950 or more

Data for Question 5 (3 points)

Smith (age 65) purchases a single premium annuity:

Annual payment:	$1,000 at the end of each year
Payment period:	For Smith's lifetime and continuing for 5 years after Smith's death
Interest rate:	5%, compounded annually

$a_{65} = 10.17548$

Question 5

In what range is the single premium paid by Smith?

(A) Less than $12,150

(B) $12,150 but less than $12,250

(C) $12,250 but less than $12,350

(D) $12,350 but less than $12,450

(E) $12,450 or more

Data for Question 15 (3 points)

Smith (age 40) is given the following actuarially equivalent payment options:

(1) A lump sum payment of $10,000; or

(2) An annual payment of X at the beginning of each year guaranteed for 10 years and continuing as long as Smith is alive.

Interest rate: 4%, compounded annually

$A_{40} = 0.30$

$A_{50} = 0.35$

$A^{1}_{40:\overline{10}|} = 0.09$

Question 15

In what range is X?

(A) Less than $539.00

(B) $539.00 but less than $541.00

(C) $541.00 but less than $543.00

(D) $543.00 but less than $545.00

(E) $545.00 or more

Data for Question 24 (4 points)

Smith (age 55) is entitled to an annual payment of X at the beginning of each year guaranteed for 10 years and continuing as long as Smith is alive. Instead, Smith elects an actuarially equivalent annuity that pays the following as long as Smith is alive:

(1) $10,000 at the beginning of each year for the first 5 years,

(2) $7,500 at the beginning of each year for the next 5 years; and

(3) $5,000 at the beginning of each year thereafter.

Interest rate: 7%, compounded annually.

Selected actuarial factors:

$\ddot{a}_{55} = 11.2751$
$\ddot{a}_{60} = 10.2758$
$\ddot{a}_{65} = 9.1301$
$\ddot{a}_{55:\overline{5}|} = 4.3122$
$\ddot{a}_{60:\overline{5}|} = 4.2707$

Question 24

In what range is X?

(A) Less than $7,375

(B) $7,375 but less than $7,425

(C) $7,425 but less than $7,475

(D) $7,475 but less than $7,525

(E) $7,525 or more

Data for Question 16 (3 points)

The following annuities are actuarially equivalent:

I. A life annuity of $1,000 per month payable at the beginning of each month starting at age 55.

II. A life annuity that provides for the payment of X per month payable at the beginning of each month from age 55 to age 62 and (X - $800) per month thereafter.

Selected actuarial values:

$$\ddot{a}_{55}^{(12)} = 11.3300$$

$$\ddot{a}_{55:\overline{7}|}^{(12)} = 5.5000$$

Question 16

In what range is X?

(A) Less than $1,100

(B) $1,100 but less than $1,200

(C) $1,200 but less than $1,300

(D) $1,300 but less than $1,400

(E) $1,400 or more

Data for Question 18 (4 points)

Smith (age 55) is entitled to a pension benefit at the beginning of each month of $750 for life commencing immediately. Smith has the option of electing a Social Security level income option such that the total of Smith's monthly income from the pension plan plus Social Security remains level for Smith's lifetime.

Smith's monthly Social Security benefit is $1,400 commencing at age 62.

Selected actuarial values:

$$\ddot{a}_{55}^{(12)} = 13.728$$
$$\ddot{a}_{62}^{(12)} = 12.218$$
$$_7E_{55} = 0.656$$

X = The monthly benefit payable to Smith from age 55 to age 62, assuming Smith elects the Social Security level income option.

Question 18

In what range is X?

(A) Less than $1,520

(B) $1,520 but less than $1,550

(C) $1,550 but less than $1,580

(D) $1,580 but less than $1,610

(E) $1,610 or more

Data for Question 20 (3 points)

Smith retires on January 1, 2008 at age 60 and can elect one of the following actuarially equivalent annuity options:

Option 1	A life annuity of \$1,000 per month, payable at the beginning of each month, commencing on January 1, 2008 at age 60, with the first 60 payments guaranteed
Option 2	A deferred life annuity of ***X*** per month, payable at the beginning of each month, commencing on January 1, 2013 at age 65

Selected values:

$$\ddot{a}_{60}^{(12)} = 13.25$$
$$_{5|}\ddot{a}_{60}^{(12)} = 8.88$$

Interest: 5% per year, compounded annually.

Question 20

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

(A) Less than \$1,485

(B) \$1,485 but less than \$1,495

(C) \$1,495 but less than \$1,505

(D) \$1,505 but less than \$1,515

(E) \$1,515 or more

Data for Question 9 (5 points)

Under a pension plan's actuarial equivalence definition:

Interest rate	7.0%, compounded annually
q_x	0.04 for $x \geq 70$

Under the plan, there are two actuarially equivalent forms of payment:

Form A:	10 years certain and payments for life thereafter
Form B:	Payments of $\boldsymbol{X}$ while the participant and spouse are both alive.
	Payments of 110% of $\boldsymbol{X}$ to participant after the death of spouse.
	Payments of 50% of $\boldsymbol{X}$ to spouse after the death of participant.

Payments are made annually at the beginning of each year.

For a participant age 72 with a spouse age 75, the benefit amount under Form A is \$100.

Question 9

In what range is $\boldsymbol{X}$ for this participant?

(A) Less than \$86

(B) \$86 but less than \$92

(C) \$92 but less than \$98

(D) \$98 but less than \$104

(E) \$104 or more

Data for Question 12 (4 points)

At normal retirement (age 60), a pension plan provides three actuarially equivalent optional forms of payment:

Form A: A lifetime annuity paying $1,000 per month

Form B: A 5-year certain and life annuity paying ***X*** per month

Form C: A 5-year certain and life annuity paying (***X***+300) per month for the first 36 months and ***Y*** per month thereafter

All payments are made at the beginning of the month.

Selected actuarial factors:

$$\ddot{a}_{60}^{(12)} = 11.53$$
$$_{3|}\ddot{a}_{60}^{(12)} = 8.83$$
$$_{5|}\ddot{a}_{60}^{(12)} = 7.35$$

Interest rate: 7.0% per year, compounded annually.

Question 12

In what range is ***Y***?

(A) Less than $873

(B) $873 but less than $883

(C) $883 but less than $893

(D) $893 but less than $903

(E) $903 or more