

Data for Question 6

Characteristics of a stationary population of 100 active members:

Entry age into the population: 25.

Preretirement terminations other than deaths: None.

Retirement age from the population: 65.

Number of deaths per year: 2.

Average age at death: 55.

Question 6

In what range is the number of new entrants each year?

- (A) Less than 2.5
- (B) 2.5 but less than 3.5
- (C) 3.5 but less than 4.5
- (D) 4.5 but less than 5.5
- (E) 5.5 or more

Data for Question 18

Prior to 1/1/70, a stationary population of 600,000 was maintained by 12,500 births each year. 35% of the total population was under age 20.

On 1/1/70, the annual birth rate increased to 13,000 and remained constant at that level thereafter. The mortality rates at all ages were unchanged.

Question 18

In what range was the total population as of 1/1/90?

- [A] Less than 605,000
- [B] 605,000 but less than 607,000
- [C] 607,000 but less than 609,000
- [D] 609,000 but less than 611,000
- [E] 611,000 or more

$N$  is the number of members in a stationary population attaining age 55 or age 56 in a calendar year who will die before attaining age 57.

Selected values:

$l_{55}$	=	100,000
$e_{55}$	=	22.245
$e_{56}$	=	21.447
$e_{57}$	=	20.661

Question 18

In what range is  $N$ ?

- [A] Less than 1,600
- [B] 1,600 but less than 2,200
- [C] 2,200 but less than 2,800
- [D] 2,800 but less than 3,400
- [E] 3,400 or more

Data for Question 24

Before 1966, a stationary population of 800,000 was maintained by annual births of 15,000. One-half of the total population was under age 30.

After 1965, annual births increased to 16,000. However, mortality rates did not change at any age.

Question 24

In what range is the total population as of 1/1/96?

- [A] Less than 810,000
- [B] 810,000 but less than 820,000
- [C] 820,000 but less than 830,000
- [D] 830,000 but less than 840,000
- [E] 840,000 or more

Data for Question 15

A college maintains a stationary population of 15,000 students by annual admissions at ages 18 and 19.

Selected values:

$x$	$l_x$	$L_x$	$T_x$
18	100,000	97,917	266,668
19	93,750	85,417	168,751
20	75,000	60,417	83,334
21	56,250	22,917	22,917
22	0	0	0

Annual admissions at age 18: 4,000.

Question 15

In what range is the number of annual admissions at age 19?

- [A] Less than 2,250
- [B] 2,250 but less than 2,500
- [C] 2,500 but less than 2,750
- [D] 2,750 but less than 3,000
- [E] 3,000 or more

Data for Question 19

A club has maintained a stationary population of 5,000 members during the last 30 years. A person can join only at age 30 and must resign at age 60 if still a member. There are 100 total terminations per year before age 60. The average age at termination is 35.

Question 19

In what range was the number of new members each year during the last 30 years?

- [A] Less than 160
- [B] 160 but less than 210
- [C] 210 but less than 260
- [D] 260 but less than 310
- [E] 310 or more

2001

Data for Question 21 (3 points)

The following facts relate to a stationary population:

Number of lives attaining age 20 each year: 1,080

Number of persons living at age 20 and older: 21,600

Number of persons living at age 50 and older: 2,700

Average age at death of those dying between ages 20 and 50:  $33 \frac{1}{3}$

Question 21

In what range is  $\overset{\circ}{e}_{50}$  ?

- [A] Less than 9.5 years
- [B] 9.5 years but less than 9.8 years
- [C] 9.8 years but less than 10.1 years
- [D] 10.1 years but less than 10.4 years
- [E] 10.4 years or more

Data For Question 18 (3 Points)

$$\mu_x = 0.1, x > 0.$$

N = the average number of years lived between age 60 and age 80 by those who die between age 60 and age 80.

Question 18

In what range is N?

- [A] Less than 7.0
- [B] 7.0 but less than 7.7
- [C] 7.7 but less than 8.4
- [D] 8.4 but less than 9.1
- [E] 9.1 or more



2003

Data For Question 7 (4 points)

There are 9,800 members in a stationary population. Each year, there are four times as many deaths at age 25 and over as there are deaths at ages under 25. The average age at death for the former group is 66. The average age at death for the latter group is 16.

$X$  = the number of members who die younger than age 25 each year.

Question 7

In what range is  $X$ ?

- [A] Less than 25
- [B] 25 but less than 28
- [C] 28 but less than 31
- [D] 31 but less than 34
- [E] 34 or more

Data for Question 30 (3 points)

A company has a stationary population of 15,000 employees. It hires 510 employees each year at the age of 24. Employees terminate employment only through death or retirement. The employees retire upon reaching age 55. The average age of the employees who die before retirement is age 50.

$X$  = the number of employees who retire each year.

Question 30

In what range is  $X$ ?

- (A) Less than 380
- (B) 380 but less than 420
- (C) 420 but less than 460
- (D) 460 but less than 500
- (E) 500 or more

Data for Question 8 (3 points)

Data for a stationary population:

Average age at death for all whose deaths occur between ages 50 and 60 is 55.567.

$$T_{50} = 2,020,000$$

$$T_{60} = 1,200,000$$

$$\ell_{50} = 87,500$$

Question 8

In what range is the number of deaths between ages 50 and 60 in this stationary population?

- (A) Less than 12,000
- (B) 12,000 but less than 12,500
- (C) 12,500 but less than 13,000
- (D) 13,000 but less than 13,500
- (E) 13,500 or more

Data for Question 20 (4 points)

A fire department admits 40 rookies each year at the age of 27, each of whom has a complete expectation of life of 55 years.

The firefighters are retired upon reaching age 52.

The fire department has reached a stationary population with 850 members having an average age of 38 years.

$X$  = the average age at death of the current firefighters.

Question 20

In what range is  $X$ ?

- (A) Less than 79
- (B) 79 but less than 82
- (C) 82 but less than 85
- (D) 85 but less than 88
- (E) 88 or more

Data for Question 23 (3 points)

A corporation maintains a stationary population by adding 1,000 new entrants age 25 each year. An entrant leaves the corporation only by death before age 65 or by retirement at age 65. All those who remain in service to age 65 retire at that age.

Given:

(1)  ${}_{40}p_{25} = 0.8$

(2) The average age at death of those who die while employed = 55

$S =$      Size of the stationary population

Question 23

In what range is  $S$  ?

- (A)    Less than 35,000
- (B)    35,000 but less than 45,000
- (C)    45,000 but less than 55,000
- (D)    55,000 but less than 65,000
- (E)    65,000 or more

Data for Question 5 (3 points)

A club has maintained a stationary population of 5,000 members during the last 30 years. A person can join only at age 30 and must resign at age 60 if still a member.

There are 100 total terminations per year before age 60. The average age at termination is 35.

$X$  = the number of new members each year during the last 30 years.

Question 5

In what range is  $X$ ?

- (A) Less than 170
- (B) 170 but less than 220
- (C) 220 but less than 270
- (D) 270 but less than 320
- (E) 320 or more