

1996

Data for Question 2

Date of a loan: 1/1/96.

Date of first repayment: 12/31/96.

Frequency of repayments: Annually.

Term of loan: 3 years.

Interest rate: 6% per year, compounded annually.

Repayments: \$900 on 12/31/96, decreasing by \$300 each year thereafter.

Part of each annual repayment is used to pay the interest on the loan. The remaining portion of each annual repayment is deposited into a sinking fund earning 5% per year, compounded annually.

Question 2

In what range is the amount of the loan as of 1/1/96?

- [A] Less than \$1,600
- [B] \$1,600 but less than \$1,620
- [C] \$1,620 but less than \$1,640
- [D] \$1,640 but less than \$1,660
- [E] \$1,660 or more

2004

Data for Question 17 (4 points)

- Loan terms: \$100,000 borrowed on 1/1/2004, issued at a 5.00% annual effective interest rate.
- Loan repayment: No repayments of principal or interest are made on the loan until a sinking fund has accumulated to pay the balance in full. This occurs at 12/31/2019.
- Sinking fund: \$10,000 annual deposits from 12/31/2004 through 12/31/2011 and \$5,000 annual deposits beginning on 12/31/2012. The sinking fund accumulation rate is $i\%$ until 12/31/2011 and $k\%$ thereafter.

During calendar year 2011, interest accrued on the loan and interest earned on the sinking fund are the same.

Question 17

In what range is $k\%$?

- (A) Less than 6.10%
- (B) 6.10% but less than 6.60%
- (C) 6.60% but less than 7.10%
- (D) 7.10% but less than 7.60%
- (E) 7.60% or more

Data for Question 3 (3 points)

Terms of a \$1,000 loan issued by Smith:

Length of loan: 20 years.

Payments: Level annual payments at the end of each year.

Interest: 5% nominal, convertible semi-annually.

When Smith receives each payment, it is immediately reinvested at 6%, compounded annually.

R is the effective annual rate of interest earned by Smith on his combined investments over the 20 year period.

Question 3

In what range is R ?

- (A) Less than 5.57%
- (B) 5.57% but less than 5.62%
- (C) 5.62% but less than 5.67%
- (D) 5.67% but less than 5.72%
- (E) 5.72% or more

Data for Question 18 (3 points)

\$150 is invested in fund A at the end of each year for 20 years at an annual effective rate of 15%.

Interest from fund A is payable annually and is immediately invested in fund B at an annual effective rate of 11%.

X is the value of fund B at the end of 20 years.

Question 18

In what range is X?

- (A) Less than \$9,100
- (B) \$9,100 but less than \$9,500
- (C) \$9,500 but less than \$9,900
- (D) \$9,900 but less than \$10,300
- (E) \$10,300 or more

2009

Data for Question 21 (4 points)

Terms of a loan:

Date of loan	1/1/2009
Amount of loan	\$100,000
Frequency of payments	Annual
First payment	12/31/2009
Term of loan	5 years

X = the sum of payments under a level annual payment schedule, with interest rate of 6.0% per year compounded annually.

Y = the sum of payments under the sinking fund method, where the lender receives interest annually at 6.0% per year, and a sinking fund accumulates annually at 5.0% per year.

Question 21

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

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