

2004

Data for Question 7 (4 points)

Details on a loan made on 1/1/2004:

Number of payments: 10.

Amount of each payment: \$5,000.

Date of first payment: 12/31/2004.

Interest rate: 8% compounded annually.

Immediately after the sixth payment, an additional \$10,000 payment is made. The loan is reamortized over a longer term to provide for annual payments of \$1,000 and a final smaller payment of X paid one year after the last \$1,000 payment.

Question 7

In what range is X?

- (A) Less than \$350
- (B) \$350 but less than \$450
- (C) \$450 but less than \$550
- (D) \$550 but less than \$650
- (E) \$650 or more

2004

Data for Question 9 (3 points)

Amount of loan:	\$10,000.
Term of loan:	20 years.
Interest rate on loan:	5% per annum, effective.
Terms of loan repayment:	20 annual payments beginning at the end of year 1 consisting of \$500 principal plus interest on the outstanding balance of the loan.

Question 9

In what range is the total amount of interest and principal paid over the term of the loan?

- (A) Less than \$15,000
- (B) \$15,000 but less than \$15,400
- (C) \$15,400 but less than \$15,800
- (D) \$15,800 but less than \$16,200
- (E) \$16,200 or more

53a

2004

Data for Question 27 (3 points)

A loan is made on 1/1/2004.

Loan repayments: 120 level monthly payments of interest and principal with the first payment at 2/1/2004.

Interest is charged on the loan at a rate of  $i^{(12)} = 7.5\%$ .

Amount of interest paid in the 54<sup>th</sup> payment of the loan = \$100.

P = Principal outstanding on the loan after the 90<sup>th</sup> payment.

Question 27

In what range is P?

- (A) Less than \$8,005
- (B) \$8,005 but less than \$8,020
- (C) \$8,020 but less than \$8,035
- (D) \$8,035 but less than \$8,050
- (E) \$8,050 or more

53a

2005

Data for Question 10 (4 points)

Date of loan: 1/1/2005.

Terms of loan repayment: 20 annual payments beginning 12/31/2005. The payment is  $X$  in the first 10 years, and 50% of  $X$  in the second 10 years.

Interest rate: 5%, compounded annually.

$Y$  is the ratio of principal repaid in the 10<sup>th</sup> payment to principal repaid in the 11<sup>th</sup> payment.

Question 10

In what range is  $Y$ ?

- (A) Less than 2.40
- (B) 2.40 but less than 2.46
- (C) 2.46 but less than 2.52
- (D) 2.52 but less than 2.58
- (E) 2.58 or more

2005

Data for Question 25 (3 points)

Loan Amount:           \$10,000

Payment Terms:       Two payments:  
                                  End of year 1:  $X$   
                                  End of year 2:  $1.1X$

Force of Interest:    $0.06 + 0.01t$ , for  $t \leq 2$

Question 25

In what range is  $X$ ?

- (A)   Less than \$5,210
- (B)   \$5,210 but less than \$5,280
- (C)   \$5,280 but less than \$5,350
- (D)   \$5,350 but less than \$5,420
- (E)   \$5,420 or more

Data for Question 1 (3 points)

Smith takes a loan repayable by equal installments at the end of each year for 20 years.

Both the principal and interest portions of the 11th payment are \$100.

Question 1

In what range is the initial amount of the loan?

- (A) Less than \$1,500
- (B) \$1,500 but less than \$1,700
- (C) \$1,700 but less than \$1,900
- (D) \$1,900 but less than \$2,100
- (E) \$2,100 or more

Data for Question 5 (4 points)

On 1/1/2006, Smith borrows a sum of money repayable in annual payments at the end of each year for 20 years. Each annual payment contains principal and interest.

The principal in the payment at the end of year  $t$  equals  $\$100t$  (for  $t = 1, 2, 3, \dots, 20$ ). The payment at the end of the year also includes the interest accrued during the year.

Interest rate: 6.0%, compounded annually.

$X =$  the present value at 1/1/2006 of interest payments made during the 20 years of the loan.

Question 5

In what range is  $X$ ?

- (A) Less than \$9,000
- (B) \$9,000 but less than \$10,000
- (C) \$10,000 but less than \$11,000
- (D) \$11,000 but less than \$12,000
- (E) \$12,000 or more

2007

Data for Question 12 (4 points)

Terms of a 30-year loan issued 1/1/2007:

Loan amount: \$1,500

Repayments: Level repayments are made every three years beginning 12/31/2009.

Interest rate: 0.0% for 2007 and 2008;  
5.0%, compounded annually, beginning in 2009.

Question 12

In what range is the principal paid in the 6th repayment?

- (A) Less than \$121
- (B) \$121 but less than \$131
- (C) \$131 but less than \$141
- (D) \$141 but less than \$151
- (E) \$151 or more



Data for Question 13 (3 points)

Interest rate: 6%, compounded annually.

On 1/1/2007, Smith takes a \$100,000 loan repayable at the end of each year for 30 years.

Scenario I: Payments in the first five years equal 50% of the interest on the outstanding balance of the loan at the beginning of the year of payment. Payments in the last 25 years are level at  $X$ .

Scenario II: Payments in the first five years equal 50% of the interest on the original amount of the loan. Payments in the last 25 years are level at  $Y$ .

Question 13

In what range is  $|X - Y|$ ?

- (A) Less than \$75
- (B) \$75 but less than \$115
- (C) \$115 but less than \$155
- (D) \$155 but less than \$195
- (E) \$195 or more

2008

Data for Question 13 (3 points)

A loan is taken on 1/1/2008 with payments at the end of each month for 60 months. Each payment is \$100. The principal paid on the loan during the first 20 months is \$1,461. The principal paid on the loan during the next 20 months is \$1,655.

Question 13

In what range is the annual effective rate of interest on the loan?

- (A) Less than 7.56%
- (B) 7.56% but less than 7.64%
- (C) 7.64% but less than 7.72%
- (D) 7.72% but less than 7.80%
- (E) 7.80% or more

2008

Data for Question 16 (3 points)

Smith takes out a \$200,000 mortgage at 1/1/2008 to be paid in equal monthly installments over 30 years. The first payment is due 2/1/2008. Immediately after the 60th payment is made, Smith makes an additional payment of \$50,000 and refinances the remaining balance in equal monthly installments over 10 years, with the first payment due at the beginning of the month following the refinancing.

Interest rate – original loan: 6% per year, compounded monthly

Interest rate – refinanced amount: 5% per year, compounded monthly

$X$  = the monthly payment amount after refinancing.

Question 16

In what range is  $X$  ?

- (A) Less than \$1,250
- (B) \$1,250 but less than \$1,500
- (C) \$1,500 but less than \$1,750
- (D) \$1,750 but less than \$2,000
- (E) \$2,000 or more

2009

Data for Question 29 (3 points)

Terms of a loan:

Initial amount of loan	\$100,000
Term of loan	40 years
Level payments	Every other year with first payment in two years
Interest rate	6% per year compounded annually

Immediately after the 10<sup>th</sup> payment, the loan is renegotiated to make level payments every 4 years, with the first such payment four years after the renegotiation. The original term of the loan remains unchanged.

$I$  = the total interest paid over the entire term of the loan.

Question 29

In what range is  $I$ ?

- (A) Less than \$150,000
- (B) \$150,000 but less than \$170,000
- (C) \$170,000 but less than \$190,000
- (D) \$190,000 but less than \$210,000
- (E) \$210,000 or more

2010

Data for Question 13 (3 points)

Amount of loan:	\$10,000.
Term of loan:	20 years.
Interest rate on loan:	5.0% per year.
Terms of loan repayment:	20 annual payments at the end of the year beginning with year 1 consisting of \$500 principal plus interest on the outstanding balance of the loan.

Question 13

In what range is the total amount of interest paid over the term of the loan?

- (A) Less than \$5,000
- (B) \$5,000 but less than \$5,400
- (C) \$5,400 but less than \$5,800
- (D) \$5,800 but less than \$6,200
- (E) \$6,200 or more

Data for Question 18 (3 points)

Terms of a loan:

Payments      Level annual, made at the end of each year.

Term            20 years.

Both the principal and interest portions of the 11th payment are \$100.

Question 18

In what range is the initial amount of the loan?

- (A)    Less than \$1,500
- (B)    \$1,500 but less than \$1,700
- (C)    \$1,700 but less than \$1,900
- (D)    \$1,900 but less than \$2,100
- (E)    \$2,100 or more