

Question 3.13

Bill's parents have deposited \$2,000 into an account that will earn an annual effective interest rate of 8% for 4 years and 6 months, at which time Bill will be given the accumulated value in the fund.

Bill uses an annual effective discount rate of 5% per year to find the present value of the payment he will receive in 4 years and 6 months.

Find the present value calculated by Bill.

- A 1,762 B 2,245 C 2,270 D 3,562 E 3,625

Question 3.14

A deposit of X is made into a fund that pays an annual effective interest rate of 3% for 12 years.

At the same time, $X/3$ is deposited into another fund that pays an annual effective rate of discount of d for 12 years.

The amounts of interest earned over the 12 years are equal for both funds.

Calculate d .

- A 2.0% B 6.6% C 7.1% D 7.5% E 8.7%

Question 3.15

At an annual effective discount rate of d , $d > 0$, each of the following two sets of payments has a present value that is equal to K :

- (i) A payment of 169 immediately and another payment of 169 at the end of 1 year.
 (ii) A payment of 196 at the end of 2 years and another payment of 196 at the end of 3 years.

Calculate K .

- A 315 B 326 C 351 D 378 E 472

Question 3.16

Which of the expressions below is FALSE?

A $i(1+i) = \frac{d}{v-vd}$

B $i^2 = \frac{d^2}{v^2}$

C $id = i - d$

D $i - d = \frac{1 - v - iv^2}{v}$

E $i + d = i(1 - v)$

Question 3.17

The annual interest rate convertible monthly is 12%. Calculate the equivalent annual effective interest rate.

- A 11.39% B 12.00% C 12.12% D 12.68% E 12.75%

Question 3.18

The annual interest rate convertible monthly is 12%. Calculate the equivalent two-year effective interest rate.

- A 24.00% B 25.37% C 25.44% D 25.50% E 26.97%

Question 3.19

Patty deposits \$1,800 into a savings account at time 0. The savings account pays simple interest at an annual rate of i .

Sally deposits \$1,000 into a different savings account at time 0. Sally's savings account pays interest at an annual nominal rate of i compounded quarterly.

Patty and Sally earn the same amount of interest during the last 3 months of the 7th year. Calculate i .

- A 8.80% B 8.88% C 9.10% D 11.16% E 36.39%

Question 3.20

Calculate the nominal annual rate of interest convertible monthly that is equivalent to a nominal rate of interest of 12% per year convertible quarterly.

- A 9.90% B 11.82% C 11.88% D 12.55% E 15.79%

Question 3.21

Wanda and Claire each open up new bank accounts at time 0.

Wanda deposits 1,000 into her bank account, and Claire deposits \$700 into hers. Each account earns the same nominal annual interest rate compounded monthly.

The amount of interest earned in Wanda's account during the 11th year is equal to X . The amount of interest earned in Claire's account during the 15th year is also equal to X .

Calculate X .

- A 18.19 B 18.96 C 218.31 D 227.50 E 761.69

Question 3.22

Sam deposits D into a savings account at time 0, and the account pays interest at a nominal rate of i , compounded semiannually.

Dennis deposits $2D$ into a different savings account at time 0, and this account pays interest at a simple annual interest rate of i .

Sam and Dennis each earn the same amount of interest during the last 6 months of the 7th year.

Calculate i .

- A 0.00% B 5.56% C 9.53% D 10.95% E 11.25%

Question 3.23

Heidi and Adam each take out a loan of L .

Heidi will repay her loan by making a payment of 1,400 in 20 years.

Adam will repay his loan by making a payment of 2,000 in 20 years.

The nominal semiannual interest rate charged to Heidi is half the nominal semiannual interest rate charged to Adam.

Calculate L .

- A 483 B 683 C 688 D 690 E 977